MONASH University

AN EXAMINATION OF ANXIETY AMONG
OLDER ADULTS
IN RESIDENTIAL CARE

ALEXANDRA SIMORIAH CREIGHTON
BPSYCH(HONS)

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS
OF THE DEGREE OF

DOCTOR OF PSYCHOLOGY (CLINICAL)

SCHOOL OF PSYCHOLOGICAL SCIENCES
FACULTY OF MEDICINE, NURSING AND HEALTH SCIENCES
MONASH UNIVERSITY
VICTORIA, AUSTRALIA

JANUARY 2018

- Page intentionally left blank -

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ADLs	Activities of daily living
AIHW	Australian Institute of Health and Wellbeing
APA	American Psychiatric Association
AUC	Area under the curve
CI	Confidence interval
CSDD	Cornell Scale for Depression in Dementia
HADS	Hospital Anxiety and Depression Scale
HADS-A	Hospital Anxiety and Depression Scale – Anxiety subscale
DoN	Director of Nursing
DSM	Diagnostic and Statistical Manual of Mental Disorders
FCI	Functional Comorbidity Index
GAD	Generalised Anxiety Disorder
GAI	Geriatric Anxiety Inventory
GP	General Practitioner
PPV	Positive predictive value
RACF	Residential aged care facility
RAID	Rating Anxiety in Dementia scale
ROC	Receiver Operating Characteristic
MCI	Mild cognitive impairment
MDD	Major Depressive Disorder
MINI	Mini International Neuropsychiatric Interview
MMSE	Mini-Mental State Examination
MSPSS	Multidimensional Scale of Perceived Social Support
NPV	Negative predictive value
RISE	Revised Index of Social Engagement
SAD	Social Anxiety Disorder
SPSS	Statistical Package for the Social Sciences
VIF	Variance inflation factor

ABSTRACT

Despite anxiety being one of the most common psychological conditions among older adults, surprisingly little is known about this condition within the growing aged care population. Given that the number of elderly people is increasing at an unprecedented rate, there is a pressing need for accurate information on the prevalence, correlates, recognition and management of anxiety in residential aged care facilities (RACFs), as well as the identification of a valid and reliable measure to detect this condition.

To help further our understanding of anxiety in aged care settings, this thesis aimed to provide an exploratory and descriptive examination of this condition among elderly RACF residents. Specifically, the thesis aimed to determine the prevalence of anxiety disorders in RACF residents (Aim 1); examine the current recognition and treatment rates of anxiety by aged care staff and GPs (Aim 2); identify an appropriate screening instrument that can be used to detect anxiety among elderly aged care residents (Aim 3); and identify the correlates of anxiety among residents (Aim 4). To address these aims, a cross-sectional observational study was conducted with a total of 180 residents (M age = 85.4 years, SD = 7.4 years) across 12 RACFs in Melbourne, Australia. Participants were assessed for threshold and subthreshold DSM-5 anxiety disorders using the MINI (a structured clinical interview), and completed three anxiety measures (GAI, HADS-A, and RAID) as well as a range of tools which assessed a variety of biopsychosocial factors. Each participant's file held at the facility was also checked to determine whether there was any indication of anxiety previously detected, and what treatment (if any) was being received.

The findings of this thesis highlight the high rate of anxiety experienced by aged care residents, with Generalised Anxiety Disorder (GAD) and Agoraphobia being the most common threshold and subthreshold anxiety disorder, respectively. Despite its frequency, the results indicated that anxiety continues to be under-reported by aged care staff and GPs, with psychotropic medication being the most common method of treatment. Despite the low rates of detection, the findings suggest anxiety can be accurately and easily assessed in aged care settings, with the GAI found to be the most suitable measure to identify GAD within the RACF sample. Last, the examination of the correlates of anxiety suggested that particular factors that staff should be aware of include residents' perceived level of mastery, self-perceived health, attachment style, and the presence of depression and cognitive impairment. It is hoped that the findings

from this thesis will aid RACF staff and GPs to better detect and subsequently manage residents who are experiencing/at-risk of experiencing this common but treatable condition.

PUBLICATIONS DURING ENROLMENT

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2015). The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *International Journal of Geriatric Psychiatry, 31*(6), 555-566.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2016). The correlates of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *International Journal of Geriatric Psychiatry, 32*(2), 141-154.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2017). The assessment of anxiety in aged care residents: A systematic review of the psychometric properties of commonly used measures. *International Psychogeriatrics,* 1-13. doi:10.1017/S1041610217002599

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2018). The prevalence, reporting, and treatment of anxiety among older adults in nursing homes and other residential aged care facilities. *Journal of Affective Disorders, 227*, 416-423. doi: 10.1016/j.jad.2017.11.029

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2018). The psychometric properties, sensitivity and specificity of the Geriatric Anxiety Inventory, Hospital Anxiety and Depression Scale, and Rating Anxiety in Dementia scale in aged care residents. Manuscript submitted for publication.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2018). The Factors Associated with Anxiety Symptom Severity in Older Adults Living in Nursing Homes and Other Residential Aged Care Facilities. Manuscript submitted for publication.

THESIS INCLUDING PUBLISHED WORKS DECLARATION

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes four original papers published in peer reviewed journals and two submitted publications which are currently under review. The core theme of the thesis is an examination of anxiety among older adults in residential aged care. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the School of Psychological Sciences, Monash University, and the Department of Psychiatry, School of Clinical Sciences at Monash Health, Monash University, under the supervision of Professor David Kissane and Dr. Tanya Davison.

The inclusion of co-authors reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of Chapters 2, 3, 4 6, 7 and 8 my contribution to the work involved the following:

Thesis Chapter	Publication Title	Status	Nature and % of student contribution	Co-author name(s) and % of Co-author's contribution*	Co-author(s) nature of contribution
Chapter 2, Review Paper 1	The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review	Published	75% Conceptualisation, data collection, writing of original draft, and editing	1) David W. Kissane 12.5% 2) Tanya E. Davison 12.5%	Supervisory guidance and editing

Thesis Chapter	Publication Title	Status	Nature and % of student contribution	Co-author name(s) and % of Co-author's contribution*	Co-author(s) nature of contribution
Chapter 3, Review Paper 2	The assessment of anxiety in aged care residents: a systematic review of the psychometric properties of commonly used measures	Published	75% Conceptualisation, data collection, writing of original draft, and editing	1) David W. Kissane 12.5% 2) Tanya E. Davison 12.5%	Supervisory guidance and editing
Chapter 4, Review Paper 3	The correlates of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review	Published	75% Conceptualisation, data collection, writing of original draft, and editing	1) David W. Kissane 12.5% 2) Tanya E. Davison 12.5%	Supervisory guidance and editing
Chapter 6, Empirical Paper 1	The prevalence, reporting, and treatment of anxiety among older adults in nursing homes and other residential aged care facilities	Published	75% Study conceptualisation, design, data collection, statistical analysis, interpretation of results and manuscript preparation	1) David W. Kissane 12.5% 2) Tanya E. Davison 12.5%	Supervisory guidance and editing
Chapter 7, Empirical Paper 2	The psychometric properties, sensitivity and specificity of the Geriatric Anxiety Inventory, Hospital Anxiety and Depression Scale, and Rating Anxiety in Dementia scale in aged care residents	Under review – revision submitted	75% Study conceptualisation, design, data collection, statistical analysis, interpretation of results and manuscript preparation	1) David W. Kissane 12.5% 2) Tanya E. Davison 12.5%	Supervisory guidance and editing

Thesis Chapter	Publication Title	Status	Nature and % of student contribution	Co-author name(s) and % of Co-author's contribution*	Co-author(s) nature of contribution
Chapter 8, Empirical Paper 3	The Factors Associated with Anxiety Symptom Severity in Older Adults Living in Nursing Homes and Other Residential Aged Care Facilities	Under review – revision submitted	75% Study conceptualisation, design, data collection, statistical analysis, interpretation of results and manuscript preparation	1) David W. Kissane 12.5% 2) Tanya E. Davison 12.5%	Supervisory guidance and editing

If no co-authors, leave fields blank

I have renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.
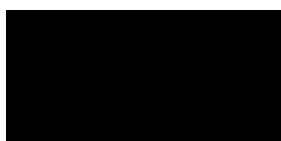
Student signature: █████████████ **Date:** 15/01/2018

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-authors' contributions to this work. In instances where I am not the responsible author I have consulted with the responsible author to agree on the respective contributions of the authors.

Main Supervisor signature: █████████████ **Date:** 15/01/2018

ACKNOWLEDGEMENTS

There are a number of people whom I wish to thank, and whose support and guidance was integral to this thesis and the completion of the doctorate. First and foremost, thank you to my supervisors, Professor David Kissane and Dr Tanya Davison. Your overwhelming knowledge and unwavering support and patience throughout the doctorate has been invaluable, and I honestly do not have the words to say how thankful I am for your supervision. Your excitement and passion for research was infectious and certainly provided me with the motivation and much-needed push to keep writing and stay focused. I am extremely grateful to have had the opportunity to work with both of you and I hope it can continue on in the future.

To the staff and residents of the aged care facilities that participated in this research – thank you ever so much for allowing me to come into your workplace/home and for sharing your knowledge, experiences, and emotions with me. Without you, this research would not have been possible and I sincerely hope that the findings contribute towards improving the identification and treatment of anxiety among all aged care residents. I would also like to acknowledge Monash University 2015 Psychology Honours student, Diana Maggs for her assistance with data collection. Thank you also to the Australian Government, which supported the completion of this research through an Australian Government Research Training Program (RTP) Scholarship.

Thank you to my doctoral cohort – I feel incredibly grateful and lucky to have experienced this crazy and exciting journey with you all, and truly believe I have made some lifelong friends. I cannot wait to celebrate this massive milestone with you all and hopefully work with you all in the future!

Above all, thank you so much to my family. To Mum, Dad, Ellie, Fini, and Maddie, who have supported me through what must have felt like a never-ending pursuit of university degrees. Your constant love, support, and encouragement has meant everything to me and I know I could not have achieved anything without you! I cannot express how thankful I am to have you as my parents and sisters! You are all my role-models. Last but certainly not least, I would like to thank my fiancé and best friend, Ollie. Throughout our 13 years together we have been on many adventures and you have provided constant unconditional love and support. Thank you so much for being my anchor throughout this doctorate. You have unquestionably supported me with every

decision I have made during this degree and been a pillar of strength. Now with this done, I cannot wait to start our next adventure together.

CHAPTER ONE

GENERAL INTRODUCTION

EXPLANATORY NOTE

This *General Introduction* provides a brief preface and rationale for the research study, which is then followed by the specific aims of this thesis. An overview of the structure and content of the thesis is also provided. It is hoped that this chapter will help orient the reader to the general research area and provide a context from which the information in the proceeding chapters (and its relevance to the research and clinical fields) can be understood.

1.1   PREFACE AND RATIONALE FOR THESIS

Approximately 172,000 people permanently reside in aged care facilities within Australia, with more than 95.0% of residents aged 65 years or older (Australian Institute of Health and Welfare [AIHW], 2015). While much attention has been paid to depression among older adults within this context – with its prevalence reported to be three to five times higher than in community-dwelling elderly (AIHW, 2013), in comparison, research into anxiety disorders is scarce and underdeveloped (Seitz, Purandare, & Conn, 2010). However, with psychiatric disorders commonly precipitating admission into residential care (Allen, Hogg, & Peace, 1992; Luppa et al., 2010) and previous studies finding anxiety to have similar risk factors to depression (Vink, Aartsen, & Schoevers, 2008), it is likely that the rate of anxiety in this frail and elderly population is high. This significant gap in our knowledge is concerning, particularly given the serious and pervasive impact of anxiety on the health, daily functioning, and wellbeing of older adults (De Beurs et al., 1999; Smalbrugge, Jongenelis, Pot, Beekman, & Eeftsting, 2006).

Given that worldwide, the elderly population is growing at an unprecedented rate (United Nations Population Fund, 2012) and previous population- and community-based studies have shown anxiety to be one of the most common mental health issues in later life (Gonçalves, Pachana, & Byrne, 2011; Trollor, Anderson, Sachdev, Brodaty, & Andrews, 2007), there is a pressing need for accurate information on the prevalence, correlates, recognition and management of anxiety in residential aged care facilities (RACFs). Currently, anxiety appears to be an under-recognised and undertreated disorder within the elderly population as a whole (Byers, Yaffe, Covinsky, Friedman, & Bruce, 2010), but we lack information about which types of anxiety are common in the growing RACF population and the ways in which they are managed. An understanding of the rate of occurrence of anxiety disorders and symptoms and the factors associated with it will have important implications for the development of appropriate interventions and prevention strategies. Furthermore, the identification of an appropriate, valid, and easy-to-use screening instrument will enable RACF staff and medical practitioners to detect and monitor individuals with anxiety, which may be helpful in improving the management of residents.

1.2.   RESEARCH AIMS

The overarching aim of this thesis was to add to the current body of research by

furthering our knowledge and understanding of anxiety in aged care. This was done by examining the prevalence, correlates, recognition, and management of anxiety among older adults living in RACFs, as well as determining the clinical utility of three commonly used measures in detecting anxiety within an aged care population. To address the key gaps in our understanding, this thesis had four overarching research aims, as described below.

1.2.1.   Research Aim One: To estimate the prevalence of anxiety disorders and comorbid Major Depressive Disorder among older adults living in RACFs. The first aim was to determine the prevalence of anxiety among elderly RACF residents. This was addressed by: (1) a systematic review of previous research on the prevalence of anxiety disorders and symptoms in RACFs; and (2) an empirical study which examined the prevalence of overall and specific threshold and subthreshold anxiety disorders among a sample of older adults residing at RACFs with normal cognitive function or mild cognitive impairment. The comorbidity of anxiety with Major Depressive Disorder (MDD) within the sample was also investigated.

1.2.2.   Research Aim Two: To determine the recognition and treatment rate of anxiety by residents' GPs. The second aim was to evaluate the treatment rate and type for anxiety among a sample of elderly aged care residents, as well as determine whether there was any indication of anxiety in participants' medical files. A further aim was to also determine whether or not mild cognitive impairment was associated with lower treatment rates of anxiety when compared to residents with normal cognitive function.

1.2.3. Research Aim Three: To determine an appropriate screening instrument to detect anxiety among older adults in RACFs. The third aim of this thesis was to determine the sensitivity and specificity of three anxiety measures in detecting anxiety in older adults living in residential aged care settings. Specifically, the goal was to identify a measure that may be effectively used as a screening tool by RACF staff. This aim was addressed through: (1) the completion of a review that identified the most commonly used measures of anxiety with aged care residents and examined the evidence of the psychometric properties of these measures with samples of aged care residents; and (2) the completion of an empirical study whereby the reliability, sensitivity, and specificity of the three most commonly used measures of anxiety (as derived from the review presented in Chapter two) were determined within an elderly RACF sample.

1.2.4. Research Aim Four: To determine the correlates of anxiety among

older adults in RACFs. The final aim of the thesis was to identify demographic, health-related, and psychosocial factors associated with anxiety symptoms among RACF residents, with the goal of identifying correlates that could either be used to detect residents who may be at-risk of experiencing anxiety, or be targeted in intervention strategies to reduce anxiety symptoms within this population. This aim was addressed through: (1) the completion of a systematic review that identified and examined previous research on the factors associated with anxiety within an aged care context; and (2) the completion of an empirical study whereby a range of biopsychosocial correlates were examined to determine their association with anxiety symptoms among elderly RACF residents.

1.3.   CONTENT AND STRUCTURE OF THESIS

This thesis is designed as a thesis-by-publication in accordance with the Monash University Doctorate of Psychology requirements, and as such there is some unavoidable repetition throughout. This is due to the need to restate the rationale and aim for each study and research methodology used within each publication.

The thesis comprises eight chapters which include three published systematic review papers and three empirical papers (one of which is published, while the remaining two are currently under review after being invited to resubmit by the reviewers and editors). Additional sections of adjoining text have also been included throughout to ensure the thesis is coherent and comprehensive.

This chapter and *Chapters two, three,* and *four* provide the research context for the thesis. The *General Introduction* (*Chapter one*) provides the rationale and research aims for the studies, while *Chapter two* consists of a published systematic review of the literature into the prevalence of anxiety disorders and symptoms in RACF settings (a paper entitled: 'The Prevalence of Anxiety among Older Adults in Nursing Homes and Other Residential Aged Care Facilities: A Systematic Review'). This chapter provides an overview of our current knowledge of the prevalence of anxiety within aged care facilities and identifies gaps and limitations in the current literature.

Chapter three comprises a published systematic review of the psychometric properties of commonly used anxiety measures within RACFs (a paper entitled: 'The Assessment of Anxiety in Aged Care Residents: A Systematic Review of the Psychometric Properties of Commonly Used Measures'). This paper provides an overview of our current understanding of the psychometric properties of the four most

frequently utilized measures within this context, identifies gaps in our knowledge, and discusses the appropriateness of the use of these measures within aged care settings.

Chapter four comprises a published systematic review of previous research examining the factors associated with anxiety among RACF residents (a paper entitled: 'The Correlates of Anxiety among Older Adults in Nursing Homes and Other Residential Aged Care Facilities: A Systematic Review').

Chapter five describes in detail the research methodology used in the three empirical papers (found in *Chapters six, seven,* and *eight*). Included in this chapter are the research design used in the empirical studies, recruitment and data collection processes, an overview of the measures used, and the statistical methods used to analyze the data.

The empirical studies of this thesis are presented in *Chapters six, seven,* and *eight*. *Chapter six* (a paper entitled: 'The Prevalence, Reporting, and Treatment of Anxiety among Older Adults in Nursing Homes and Other Residential Aged Care Facilities') presents the prevalence rates of current threshold and subthreshold anxiety disorders within an elderly aged care sample, as well as the recognition and treatment rates and management strategies used by RACF staff. *Chapter seven* (a paper entitled: 'The Psychometric Properties, Sensitivity and Specificity of the Geriatric Anxiety Inventory, Hospital Anxiety and Depression Scale, and Rating Anxiety in Dementia Scale in Elderly Aged Care Residents') details the reliability, validity, sensitivity and specificity of the three most commonly used anxiety measures in detecting Generalized Anxiety Disorder (GAD) within a sample of RACF residents. In *Chapter eight* (a paper entitled: 'The Factors Associated with Anxiety Symptom Severity in Older Adults Living in Nursing Homes and Other Residential Aged Care Facilities'), the results of a hierarchical regression analysis examining the correlates of self-rated anxiety (as measured by the Geriatric Anxiety Inventory (GAI)) and their independent association with anxiety within a RACF sample are presented.

The final chapter of this thesis is *Chapter nine,* which comprises an integrated general discussion. Here, an overall summary of the main findings of the thesis is provided, with the strengths and limitations of the research outlined, as well as the clinical and research implications, potential directions for future studies, and concluding remarks.

1.4. SUMMARY AND CONCLUSIONS

In this *General Introduction*, a brief introduction to the research context of this thesis was provided. This included a rationale for the thesis and an outline of the research aims, as well as an overview of the content and structure of the thesis. In the following chapter (*Chapter two*), a more detailed examination of our current knowledge of the occurrence of anxiety disorders and symptoms in RACFs is provided. This is done via a systematic literature review of previous research into the prevalence of this condition within aged care settings.

Declaration by Candidate

In the case of Chapter two, the nature and extent of my contribution to the work was the following:
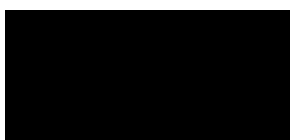
Nature of contribution	Extent of contribution (%)
Study conceptualization, identification, screening, analysis, and interpretation of relevant literature, and preparation of manuscript.	75

The following co-authors contributed to the work:

Name	Nature of contribution
Dr. Tanya Davison	Provided guidance on the interpretation of literature and write-up, as well as the reading of drafts of the manuscript and provision of feedback and suggestions.
Professor David Kissane	Provided guidance on the interpretation of literature and write-up, as well as the reading of drafts of the manuscript and provision of feedback and suggestions.

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work:

Candidate's Signature		Date 15/01/2018

Main Supervisor's Signature		Date 15/01/2018

CHAPTER TWO

THE PREVALENCE OF ANXIETY AMONG OLDER ADULTS IN NURSING HOMES AND OTHER RESIDENTIAL AGED CARE FACILITIES: A SYSTEMATIC REVIEW

2.1. PREAMBLE TO REVIEW PAPER ONE

This chapter presents the first systematic review of the thesis, which sought to identify and collate the literature on the prevalence of anxiety disorders and symptoms within RACFs. Although a number of previous reviews of the literature on the prevalence of anxiety within older adults in general have been conducted, prior to this review no systematic review had specifically investigated the current field's knowledge and understanding of this condition within aged care settings. The focus of this review, therefore, was to identify and evaluate the current research on the prevalence of overall and specific anxiety disorders and clinically significant anxiety symptoms among elderly RACF residents. Conceptual and methodological limitations of the current literature were also identified. This review provides an introduction and aids in building a rationale for the first empirical paper (*Chapter six*), which aimed to determine the prevalence of anxiety disorders within RACFs and examine the current recognition and treatment rates within this setting.

This review has been published in the *International Journal of Geriatric Psychiatry*, a peer-reviewed journal with an impact factor of 3.018 (ISI Web of Science, 2017). In accordance with Monash University's guidelines for a thesis including published works, the manuscript has been presented in the original publication format of the journal. However, the tables and figures within the manuscript have been renumbered to generate a consistent presentation and order within the thesis. This paper has been reprinted with permission from John Wiley & Sons, Ltd (see Appendix A).

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2015). The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *International Journal of Geriatric Psychiatry, 31*(6), 555-566. doi: 10.1002/gps.4378

REVIEW ARTICLE

The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review

Alexandra S. Creighton[1,2], Tanya E. Davison[2] and David W. Kissane[2]

[1]School of Psychological Sciences, Monash University, Clayton, Victoria, Australia
[2]Department of Psychiatry, Monash University, Clayton, Victoria, Australia
Correspondence to: D. W. Kissane, E-mail: David.Kissane@monash.edu

Objectives: To synthesize and summarize the studies examining the prevalence rate of anxiety disorders and symptoms in older adults living in residential aged care.

Methods: Using the PRISMA guidelines, five electronic databases were searched using key terms and subject headings, as well as reference lists of relevant papers. The search was limited to literature published in English. Eligible studies examined the prevalence of anxiety disorders or symptoms in aged care residents aged 50+ years.

Results: A total of 2249 articles were identified, of which 18 studies (with a total of 5927 participants) were included in this review. The rate of overall anxiety disorders ranged from 3.2% to 20%, with the highest quality studies estimating a prevalence rate of 5% to 5.7%. Generalized anxiety disorder and specific phobias were found to be the most common anxiety disorders among aged care residents, while clinically significant anxiety symptoms were found to be more frequent (6.5% to 58.4%) than threshold disorders.

Conclusions: Anxiety disorders and anxiety symptoms are common in older aged care residents. Given the paucity and overall quality of research examining anxiety within this population and the heterogeneity found in studies, further research is needed to help clarify this issue. Copyright © 2015 John Wiley & Sons, Ltd.

Introduction

Despite anxiety being one of the most common psychiatric conditions in later life (Gonçalves *et al.,* 2011), only recently has interest gained momentum into anxiety among residents of aged care facilities (known variously as nursing homes, hostels, assisted living facilities, or long-term care/residential homes). This is surprising, particularly given that psychiatric disorders commonly precipitate admission into residential care (Luppa *et al.,* 2010), and older residents represent an increasingly frail and medically ill group who are at increased risk for anxiety (Tolin *et al.,* 2005; Gerolimatos *et al.,* 2013).

Studies examining the prevalence of anxiety in community-dwelling older adults have reported varying estimates. The rate of anxiety disorders has been found to range from 1.4% (Copeland *et al.,*

1987) to 17.1% (Kirmizioglu *et al.,* 2009), with the variance likely to be a result of the heterogeneity in the older population, the specific anxiety disorders assessed, and diagnostic nosology used. Specific phobias and generalized anxiety disorder (GAD) have been found to account for 90% of presentations of late-life anxiety within the community (Krasucki *et al.*, 1999). Panic disorder and agoraphobia are reported to be the least prevalent, ranging from 0.1% (Weissman *et al.*, 1985; Manela *et al.*, 1996) to 2% (Junginger *et al.*, 1993) and 0.3% (Préville *et al.*, 2008; Grenier *et al.*, 2011) to 10.4% (Ritchie *et al.*, 2013), respectively. Overall prevalence of both subsyndromal anxiety and anxiety symptoms in community-dwelling older adults has been reported to be much higher (Heun *et al.*, 2000). To illustrate, Grenier *et al.* (2011) reported that 12-month prevalence rates for any anxiety disorder increased by 20.6% when subsyndromal anxiety was included.

To date, reviews have been conducted on the epidemiology of anxiety among older adults in general (e.g., Alwahhabi, 2003; Bryant *et al.*, 2008); however, no systematic review has specifically examined research into the prevalence of anxiety in the rapidly growing residential aged care facility (RACF) population. With the older population increasing at an unprecedented rate (Beard and Bloom, 2015), this significant gap in our knowledge is concerning, particularly given the serious and pervasive impact of anxiety on the health, daily functioning, and well-being of older adults (De Beurs *et al.*, 1999; Smalbrugge *et al.*, 2006), and the possibility that admission to RACFs may increase anxiety. Understanding the prevalence of anxiety in RACFs is important and has significant implications for the development of appropriate interventions and prevention strategies for this already frail and vulnerable population. Therefore, this systematic review aims to describe and evaluate current knowledge on the prevalence of overall and specific anxiety disorders and clinically significant anxiety symptoms among older RACF residents. A secondary aim was to examine key conceptual and methodological issues in the literature and to identify gaps and potential directions for future research.

Methods

Identification of relevant literature

The review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA Statement; Moher *et al.*, 2009). Five databases (Scopus, PsycINFO, Ovid MEDLINE, CINAHL, and Cochrane) were searched on 26 April 2015 using the following terms: (prevalence OR rate OR epidemiol*) AND (anxiety OR anxiety disorders OR anxiety symptoms OR subthreshold anxiety OR subsyndromal anxiety OR specific OR simple phobia OR generali* anxiety disorder OR agoraphobia OR panic disorder OR social phobia OR social anxiety disorder) AND (nursing home* OR aged care OR assisted living OR residential care). Reference lists of included articles were manually screened to identify relevant papers that had not yet been included.

Eligibility criteria

As no previous review has been conducted of the literature on the prevalence of anxiety in RACFs, all studies that had been published from inception to April 2015 were considered. Studies were included if they were as follows:

(1) Peer-reviewed, empirical articles reporting cross-sectional or longitudinal quantitative data on the prevalence of anxiety disorders or symptoms;
(2) Included data on RACF residents aged 50 years or older; and
(3) Published in English.
(4) For those diagnosing anxiety disorders, the studies provided current, 1-month, 6-month, or 12-month diagnoses. Lifetime diagnoses were excluded as they provide less information about the current status of the older population and capture

earlier diagnoses that may have not continued into late age.

The primary outcome measure was the prevalence rate of anxiety disorders and symptoms in the RACF population. Case reports and qualitative studies were excluded as they were considered to be outside the scope of this review.

For the purposes of this review, anxiety symptoms were defined as feelings of anxiety that are assessed using a dimensional self-report or informant-rated instrument and considered to be clinically significant, as determined by a cut-off score.

Study selection and data extraction

Using the systematic review software Covidence, all references returned by the electronic searches were examined for duplicates and screened by title and abstract, after which the full text for eligible studies was sourced. For each included study, information was collected on country and year of publication, study design, sample size, age range/mean age of participants, assessment methods, and the prevalence rate of anxiety disorder(s) or symptoms. Six authors (Junginger *et al.*, 1993; Parmelee *et al.*, 1993; Class *et al.*, 1996; Forsell and Winblad, 1997; Arvaniti *et al.*, 2005; Jervis and Manson, 2007) were contacted via email for further information regarding the time period and number of participants in their sample diagnosed with specific anxiety disorders. One author no longer had the data, and two did not respond.

Given the heterogeneity in study methodologies, definitions of anxiety, measures used, and specific anxiety disorders assessed, pooling of data and completion of a meta-analysis was considered inappropriate. However, to provide a visual representation of the prevalence rates of anxiety disorders and symptoms across studies, forest plots were created using StatsDirect 3, with 95% confidence intervals (CI) calculated using MedCalc.

Appraisal of the methodological quality

Methodological quality appraisal was completed using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers (Kmet *et al.*, 2004). This checklist comprises 11 criteria assessing the following: appropriateness of the study's design, clarity with which participant selection and characteristics are described, adequacy of sample size, appropriateness of analytic methods, and whether the conclusions were supported by the data. Each criterion is given a score from 0 to 2, with 2 given for fully meeting the criterion, 1 for partially meeting the criterion, and 0 for not meeting criterion. A summary score ranging from 0 to 1 was calculated, with higher scores indicating a higher level of methodological quality. Because relatively few studies addressed our study questions, we included all studies directly relevant to the questions regardless of their quality.

Results

The search returned 2611 references (see Figure 2.1). After removal of duplicates, 1926 studies remained. These were screened by title and abstract, with 1886 references excluded after reviewing the abstracts because they clearly did not meet eligibility criteria. The full texts of the remaining 40 articles were then assessed for eligibility, with 18 studied included in the review. Figure 2.1 outlines the process of study selection and exclusion details.

Characteristics of included studies

Eighteen studies were included in this review, with the majority ($n = 17$, 94%) utilizing a cross-sectional design. Sample sizes ranged from 40 (Arvaniti *et al.*, 2005) to 1163 (Selbæk *et al.*, 2007), with a total of 5927 participants across all studies (median = 198.5 participants).

Participant inclusion criteria varied widely, with nine studies setting a minimum age that ranged from those aged ≥55 years (Smalbrugge *et al.*, 2005) to

those aged ≥78 years (Forsell and Winblad, 1997), as detailed in Tables 2.1 and 2.2. Eight studies reported no age cut-off but had a mean age ranging from 74.9 years to 86.2 years. In terms of level of cognitive functioning, two studies (11%; Drageset *et al.*, 2013; Haugan, 2014) excluded residents with any cognitive impairment or dementia; two studies (11%; Cheok *et al.*, 1996; Smalbrugge *et al.*, 2005) included residents with a mini-mental state examination (Folstein *et al.*, 1975) score of ≥18 and ≥15, respectively; and eight (44%; Class *et al.*, 1996; Jervis and Manson, 2007; Kang *et al.*, 2010; Neville and Teri, 2011; Sandberg *et al.*, 1998; Selbæk *et al.*, 2007; Smith *et al.*, 2008; Zuidema *et al.*, 2007) included residents with and without a dementia diagnosis. Two studies (Bland, Newman, & Orn, 1988; Parmelee *et al.*, 1993) excluded residents who could not communicate meaningfully or were mute. The remaining four studies (22%) did not report any inclusion criteria regarding level of cognitive functioning.

Overall prevalence of anxiety disorders

Nine studies (n = 2313) examined the overall prevalence of anxiety disorders in RACFs. Details of these studies are outlined in Table 2.1, and a visual representation of each study's prevalence estimate (with 95% CIs) is depicted in Figure 2.2.

Considerable differences across studies were found with regard to diagnostic criteria, measures used, and specific anxiety disorders assessed. Three studies (Forsell and Winblad, 1997; Arvaniti *et al.*, 2005; Smalbrugge *et al.*, 2005) diagnosed anxiety disorders using DSM-IV (American Psychiatric Association, 1994), two studies (Junginger *et al.*, 1993; Cheok *et al.*, 1996) used the revised third edition of the DSM (DSM-III-R; American Psychiatric Association, 1987), one (Parmelee *et al.*, 1993) used 'modified' DSM-III-R criteria, one (Bland *et al.*, 1988) used the third edition of the DSM (DSM-III; American Psychiatric Association, 1980), and two studies (Kay *et al.*, 1987; Jervis and Manson, 2007)
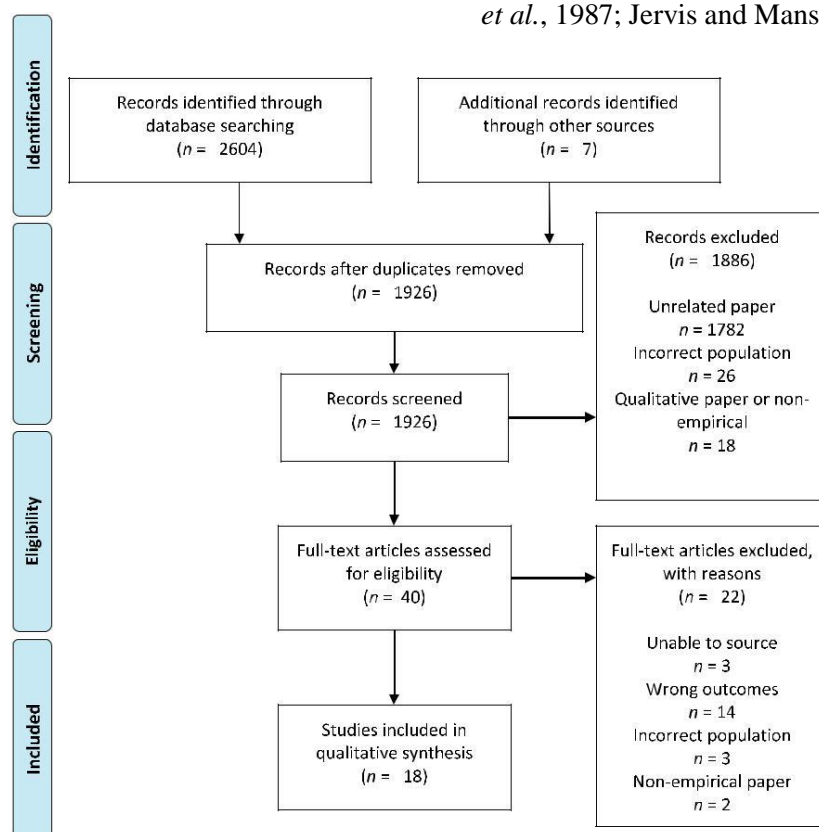
Figure 2.1 Flowchart depicting process of study selection.

Int J Geriatr Psychiatry 2015

Anxiety among older adults in residential care

Table 2.1 The prevalence of overall and specific anxiety disorders within residential aged care facilities (RACFs)

Study	N	Design (location of sample)	Age (years)	Diag. criteria	Assessment measure(s)	Prevalence (%) of any anxiety disorder (period[a])	Prevalence (%) of specific anxiety disorder (period)						Quality rating
							GAD	Specific phobia	Social anxiety disorder	Panic disorder	Agora.	OCD	
Arvaniti et al. (2005)	40	Cross-sectional, 1 RACF (Greece)	65+	DSM-IV	MINI	17.5	–	–	–	–	–	–	0.68
Bland et al. (1988)	199	Cross-sectional, systematic sample of residents from 1 RACF (Canada)	65+	DSM-III	DIS	5.0 (6 months)	–	1	–	1	–	3.5	0.94
Cheok et al. (1996)	107	Cross-sectional, 5 RACFs (Australia)	65+	DSM-III-R	GMS GAS	3.7 (current)	11.2	14[b]	–	0.9	–	–	0.78
Class et al. (1996)	106	Cross-sectional, representative sample of 6 RACFs (USA)	65–101	DSM-III-R	Modified PSE	–	0.9 (current)	–	–	–	–	–	0.80
Forsell and Winblad (1997)	966	Cross-sectional, RACFs (Sweden)	78+	DSM-IV	CPRS	3.2 (current)	–	–	–	–	–	–	0.85
Jervis and Manson (2007)	45	Cross-sectional, 1 American Indian RACF (USA)	60–96	Not stated	MDS (from residents' file)	9.0	–	–	–	–	–	–	0.65
Junginger et al. (1993)	100	Cross-sectional, random sample of residents from 1 RACF (USA)	65+	DSM-III-R	SCID	20	6	1	0	5	4	5	0.75
Kay et al. (1987)	72	Cross-sectional, 14 RACFs (Australia)	70+	Not stated	GMS	6.9 (1 month)	–	–	–	–	–	–	0.85
Parmelee et al. (1993)	451 (at Time 2)	Longitudinal, 1 RACF (USA)	61–102	Modified DSM-III-R	Symptom checklist	3.3 (current)	–	–	–	–	–	–	0.70
Smalbrugge et al. (2005)	333	Cross-sectional, representative sample of 14 RACFs (Netherlands)	55+	DSM-IV	SCAN	5.7 (current)	1.2	2.1	0.6	1.5[c]	2.1[d]	–	0.95

Diag. criteria, diagnostic criteria; GAD, generalized anxiety disorder; Agora, agoraphobia; DSM-IV, Diagnostic and Statistical Manual—fourth edition; MINI, MINI International Neu-ropsychiatric Interview; DSM-III, Diagnostic and Statistical Manual—third edition; DIS, Diagnostic Interview Schedule; DSM-III-R, Diagnostic and Statistical Manual—third edition— revised; RDC, Research Diagnostic Criteria; GMS, Geriatric Mental Schedule; GAS, Generalized Anxiety Scale; SADS-L, Schedule for Affective Disorders and Schizophrenia, Lifetime Version; PSE, Present State Examination; CPRS, Comprehensive Psychopathological Rating Scale; MDS, minimum data set; SCID, Structured Clinical Interview for DSM-III-R; SCAN, Schedules for the Clinical Assessment in Neuropsychiatry; OCD, obsessive-compulsive disorder.
[a] The period of time (e.g., 1-month prevalence) for overall anxiety disorders is the same for each specific anxiety disorder for each study, unless noted differently.
[b] This study combined all phobic disorders together, with the prevalence reported here.
[c] This prevalence rate includes the diagnoses of panic disorder with and without agoraphobia.
[d] This prevalence rate includes the diagnoses of agoraphobia with and without history of panic disorder and panic disorder with agoraphobia.

did not state what criteria were used. Seven studies used a diagnostic interview to examine the prevalence of anxiety disorders, while one study (Forsell and Winblad, 1997) utilized a rating scale. In terms of the specific anxiety disorders included in each overall prevalence rate, five studies (56%; Arvaniti *et al.*, 2005; Forsell and Winblad, 1997; Jervis and Manson, 2007; Kay *et al.*, 1987; Parmelee *et al.*, 1993) did not report which disorders were assessed, Junginger *et al.* (1993) included six disorders (panic disorder, agoraphobia, social phobia, specific phobia, obsessive–compulsive disorder (OCD), and GAD), Smalbrugge *et al.* (2005) included five disorders (panic disorder, agoraphobia, social phobia, and specific phobia), Bland *et al.* (1988) included four disorders (phobia, panic disorder, OCD, and somatization), and Cheok *et al.* (1996) included three disorders (GAD, panic disorder, and specific phobia). One study (Cheok *et al.*, 1996) applied hierarchical rules when making a diagnosis, while other studies did not comment on the use of these rules.

Overall prevalence rates for any anxiety disorder ranged from 3.2% (Forsell and Winblad, 1997) to 20% (Junginger *et al.*, 1993). Studies that assessed more anxiety disorders appeared to report a higher overall prevalence rate than those assessing fewer disorders. Further, studies with higher methodological quality ratings and larger sample sizes tended to report lower overall prevalence rates.

Prevalence of specific anxiety disorders

Five studies reported the prevalence of one or more specific anxiety disorder, with none reporting the prevalence of post-traumatic stress disorder (see Table 2.1). As with the overall prevalence of anxiety disorders, there was wide variation across studies in diagnostic criteria and measures used. In terms of criteria, one study (Bland *et al.*, 1988) used DSM-III, three studies (Junginger *et al.*, 1993; Cheok *et al.*, 1996; Class *et al.*, 1996) used DSM-III-R, and

one (Smalbrugge *et al.*, 2005) used DSM-IV. Three studies used a structured diagnostic interview (Bland *et al.*, 1988; Junginger *et al.*, 1993; Cheok *et al.*, 1996) to diagnose anxiety disorders, Smalbrugge *et al.* (2005) used a semi-structured diagnostic interview, and Class *et al.* (1996) utilized a rating scale and assessment by a psychiatrist.

The prevalence of generalized anxiety disorder. Four studies reported the prevalence of GAD, with rates ranging from 0.9% (Class *et al.*, 1996) to 11.2% (Cheok *et al.*, 1996). Junginger *et al.* (1993) found GAD to be the most common anxiety disorder. Cheok *et al.* (1996) reported it to be the second most common disorder after specific phobia, while Smalbrugge *et al.* (2005) reported it to be the second least common.

The prevalence of specific phobia. Four studies estimated the prevalence of specific phobias among older residents, with rates ranging from 1% (Bland *et al.*, 1988; Junginger *et al.*, 1993) to 14% (Cheok *et al.*, 1996). Cheok *et al.* (1996) found phobic disorders to be the most common anxiety disorder. Bland *et al.* (1988) and Smalbrugge *et al.* (2005) reported it to be as common as panic disorder and agoraphobia with and without panic disorder, respectively. Finally, Junginger *et al.* (1993) found it to be the second least common anxiety disorder. Cheok *et al.* (1996) was the only study to report the specific situations that participants feared, with phobias expressed about enclosed spaces (10), being alone (7), travelling (2), going outside (1), and cats and dogs (2).

The prevalence of social anxiety disorder. Two studies (Junginger *et al.*, 1993; Smalbrugge *et al.*, 2005) examined the prevalence of social anxiety disorder among RACF residents, with both finding it to be the least common anxiety disorder within this population. Specifically, Junginger *et al.* (1993) found no participants met criteria for social anxiety disorder using the Structured Clinical Interview for DSM-III-R (SCID; Spitzer et

Anxiety among older adults in residential care

Table 2.2 The prevalence of anxiety symptoms within residential aged care facilities (RACFs)

Study	N	Design (location of sample)	Age (years)	Assessment measure(s)	Prevalence (%) of significant anxiety symptoms	Quality rating
Drageset et al. (2013)	227	Cross-sectional, convenience sample of residents of 30 RACFs (Norway)	65+	HADS-A	14[a]	0.90
Haugan (2014)	202	Cross-sectional, 44 RACFs from 20 randomly selected municipalities (Norway)	Mean age = 85.9	HADS-A	12[a]	0.85
Kang et al. (2010)	46	Secondary analysis of cross-sectional data from 5 RACFs (USA)	60+	HARS	6.5[b]	0.75
Neville and Teri (2011)	148	Retrospective, secondary analysis of cross-sectional data from 19 RACFs (USA)	69–101	RAID CAS	11[c] (RAID) 18[d] (CAS)	0.85
Sandberg et al. (1998)	202	Cross-sectional 3 RACFs (Sweden)	75+	OBS Scale	58.4[e]	0.72
Selbæk et al. (2007)	1163	Cross-sectional sample, 26 RACFs (Norway)	Mean age = 84.4	NPI	20.5[f]	0.75
Smalbrugge et al. (2005)	333	Cross-sectional, representative sample of 14 RACFs (Netherlands)	55+	SCAN	29.7[g]	0.95
Smith et al. (2008)	198	Cross-sectional, stratified random sample of 22 RACFs (USA)	Not stated	NPI CSDD	22.2[h]	0.85
Zuidema et al. (2007)	1322	Cross-sectional, 59 RACFs (Netherlands)	Mean age = 80	NPI-NH	21[i]	0.80

Diag. criteria, diagnostic criteria; GAD, generalized anxiety disorder; Agora., agoraphobia; HADS-A, Hospital Anxiety and Depression Scale—Anxiety Subscale; HARS, Hamilton Anxiety Rating Scale; RAID, Rating Anxiety in Dementia Scale; CAS, Clinical Anxiety Scale; OBS Scale, Organic Brain Syndrome Scale; NPI, Neuropsychiatric Inventory; SCAN, Schedules for the Clinical Assessment in Neuropsychiatry; CSDD, Cornell Scale for Depression in Dementia; NPI-NH, Neuropsychiatric Inventory—Nursing Home version.
[a]Study used a cut-off score of ≥8 on HADS-A.
[b]Study used a cut-off score of ≥17 on the HARS.
[c]Study used a cut-off score of ≥11 on the RAID.
[d]Study used a cut-off score of ≥30 on the CAS.
[e]Study did not provide the cut-off score used on the OBS Scale.
[f]Study used a cut-off score of ≥4 on NPI.
[g]Study used a threshold of 1 or more anxiety symptom reported on the SCAN.
[h]Study used the endorsement of NPI's anxiety subscale screening question, which addresses being nervous, worried, or frightened for no apparent reason; seeming tense or fidgety; or being afraid to be apart from the caregiver, to determine prevalence of anxiety symptoms.
[i]Study used a cut-off of ≥4 on the NPI-NH.

A. S. Creighton *et al.*

Forest plot

Study		Prevalence (95% CI)
Junginger et al. (1993)		20.00 (12.22, 30.89)
Arvaniti et al. (2005)		17.50 (7.04, 36.06)
Jervis & Mason (2007)		8.89 (2.42, 22.76)
Kay et al. (1987)		6.94 (2.26, 16.21)
Smalbrugge et al. (2005)		5.71 (3.44, 8.91)
Bland et al. (1988)		5.03 (2.41, 9.24)
Cheok et al. (1996)		3.74 (1.02, 9.57)
Parmelee et al. (1993)		3.33 (1.86, 5.49)
Forsell & Winblad (1997)		3.21 (3.21, 4.56)

Prevalence (95% confidence interval)
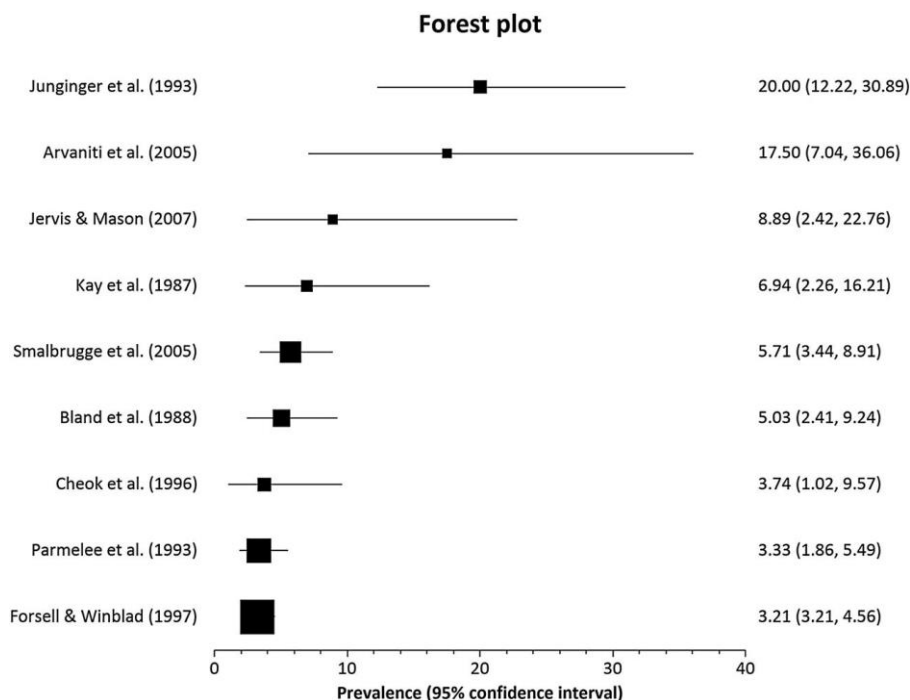
Figure 2.2 Overall prevalence of anxiety disorders in residential aged care settings.

al., 1990). Similarly, using the Dutch edition of the Schedules for the Clinical Assessment in Neuropsychiatry (World Health Organization, 1999), Smalbrugge *et al.* (2005) found the current prevalence rate to be 0.6%.

The prevalence of panic disorder. Four studies examined the prevalence of panic disorder among older aged care residents, with rates ranging from 0.9% (Cheok *et al.*, 1996) to 5% (Junginger *et al.*, 1993). One study (Smalbrugge *et al.*, 2005) included the diagnoses of panic disorder with and without agoraphobia in their estimate. Bland *et al.* (1988) found panic disorder to be as common as specific phobia, Cheok *et al.* (1996) found it to be the least common anxiety disorder, while Junginger *et al.* (1993) and Smalbrugge *et al.* (2005) reported it to be the second most common disorder after GAD and specific phobia, respectively.

The prevalence of agoraphobia. Two studies (Junginger *et al.*, 1993; Smalbrugge *et al.*, 2005) provided the prevalence rate of agoraphobia within their samples, with Smalbrugge *et al.* (2005) including in their estimate the diagnoses of agoraphobia with and without history of panic disorder, and panic disorder with agoraphobia. Using the SCID for DSM-III-R, Junginger *et al.* (1993) found agoraphobia to be the third most common anxiety disorder (4%) after GAD and panic disorder. Smalbrugge *et al.* (2005) found agoraphobia with and without history of panic and panic disorder with agoraphobia to be the second most common disorder (2.1%), after specific phobia.

The prevalence of obsessive compulsive disorder. Two studies (Bland *et al.*, 1988; Junginger *et al.*, 1993) examined the occurrence of OCD, with Bland *et al.* (1988) reporting its 6-month prevalence rate to be 3.5% and finding it more common than specific phobia and panic disorder. Junginger *et al.* (1993) found OCD to be as common as panic disorder (5%) and the second most common anxiety disorder after GAD.

Prevalence of anxiety symptoms

Nine studies examined the prevalence of anxiety symptoms in older RACF residents, with rates ranging from 6.5% (Kang *et al.*, 2010) to 58.4% (Sandberg *et al.*, 1998) (see Table 2.2 and Figure 2.2). Two studies (Drageset *et al.*, 2013; Haugan and Drageset, 2014) assessed anxiety symptoms using a self-report measure, three (Selbæk *et al.*, 2007; Zuidema *et al.*, 2007; Smith *et al.*, 2008) utilized a caregiver-reported tool, one study (Sandberg *et al.*, 1998) used a measure that included both observations and an interview with the resident, one (Kang *et al.*, 2010) used a clinician-rated tool, and one study (Smalbrugge *et al.*, 2005) used a clinician-administered diagnostic inter-view. Neville and Teri (2011) used both a self-report measure and a rating scale that utilizes self-report, caregiver reports, and clinician judgement. Inspection of Table 2.2 and Figure 2.2 indicated a general trend for studies with larger samples to report higher prevalence rates of anxiety symptoms.

Discussion

This is the first systematic review to examine the prevalence of anxiety disorders and symptoms among older aged care residents. Eighteen studies were identified, with a wide variation in prevalence estimates reported across studies.

Compared with community-dwelling older adults, there is a higher overall prevalence of anxiety disorders among older aged care residents; estimates range widely from 3.2% to 20% compared with 1.4% to 17% in the community. This is consistent with two studies that examined the difference between the prevalence of DSM-III (American Psychiatric Association, 1980) anxiety disorders in community and aged care populations (Bland *et al.*, 1988; Junginger *et al.*, 1993). However, a more recent study by Arvaniti *et al.* (2005) found the prevalence to be higher among community-dwelling older

adults than aged care residents (20% and 17.5%, respectively). While it is possible that the variation in anxiety prevalence estimates and lack of consistency across studies may reflect genuine differences between aged care samples, it is more likely that they are due to differences in methodology (Bryant *et al.*, 2008).

With regard to the prevalence of specific anxiety disorders, as with community-dwelling populations, GAD and specific phobia appear to be the most common anxiety disorders among older adults in residential care, with all five studies investigating the prevalence of specific disorders finding these disorders to be equally or more common than any other anxiety condition (Bland *et al.*, 1988; Junginger *et al.*, 1993; Cheok *et al.*, 1996; Class *et al.*, 1996; Smalbrugge *et al.*, 2005).

Very little is known about the occurrence of social anxiety disorder and agoraphobia in aged care, with only Junginger *et al.* (1993) and Smalbrugge *et al.* (2005) providing specific prevalence estimates. These authors suggested that agoraphobia is relatively common (4% and 2.1%, respectively), while social anxiety disorder is rare within this context (0% and 0.6%, respectively). Given that older adults in RACFs tend to have fewer obligations than their community-dwelling peers and are typically more restricted in their daily activities (De Bellis, 2010), residents may find it easier to avoid certain activities and situations that evoke social anxiety. The low prevalence rate could be due to researchers misattributing anxiety symptoms (e.g., avoidance) to diminished physical abilities, such as visual or gait problems (D. V. Jeste *et al.*, 2005). Thus, not only should future research into anxiety among older aged care residents examine the prevalence of each specific anxiety disorder, studies should also attempt to use well-defined diagnostic criteria that distinguish between anxiety disorders and those behaviours that may be secondary to a medical or physical condition.

Akin to community-dwelling older adults, the prevalence of anxiety symptoms

within aged care facilities was found to be higher than that of threshold anxiety disorders. The rate of clinically significant symptoms ranged from 6.5% (Kang *et al.*, 2010) to 29.7% (Smalbrugge *et al.*, 2005). Because these estimates are similar to those found in community-dwelling samples, older adults in both contexts may be equally prone to experiencing some level of anxiety that warrants intervention.

Further studies are needed to both characterize and clarify how common the experience of clinically relevant anxiety is here. It has been argued that a more nonspecific manifestation of anxiety within a RACF population is likely due to multiple comorbidities (Smalbrugge *et al.*, 2005), while in the general community, anxiety symptoms have been found to be associated with similar levels of functional impairment and decreased quality of life as threshold anxiety disorders (Lewinsohn *et al.*, 2004; Kessler *et al.*, 2005). Thus, assessing the rate of anxiety symptoms may provide a better estimate of the true burden of clinically relevant anxiety within the aged care population.

Although most of the research is of poor quality, based on the evidence provided by the two highest quality studies (i.e., attained a methodological quality score of ≥0.90) (Bland *et al.*, 1988; Smalbrugge *et al.*, 2005), the prevalence of any anxiety disorder within RACFs appears to range from 5% to 5.7%. Similarly, based on the findings of Drageset *et al.* (2013) and Smalbrugge *et al.* (2005), the prevalence of clinically significant anxiety symptoms appears to be higher, ranging from 14% to 29.7%. Future studies should aim to address the limitations outlined below to ensure their research is more methodologically sound and therefore provide a more definitive answer to the prevalence of anxiety in aged care.

Limitations of current prevalence research

A key limitation of the literature on the prevalence of anxiety in RACFs is the overall lack of attention given to this clinical issue, particularly when compared with depression. Furthermore, most studies were conducted in the 1990s using the now outdated DSM-III criteria. Research specifically examining the prevalence of anxiety among the current cohort of older adults using contemporary diagnostic criteria is urgently needed to provide us with a current understanding of this issue. This is particularly significant given that aged care residents are becoming increasingly older, more medically complex, and residing at these facilities longer (Department of Health and Ageing, 2011; Harris-Kojetin *et al.*, 2013).

Another limitation is the considerable discrepancy across studies in reported prevalence rates. While this may indicate genuine differences between populations, including differences across cultures, it also reflects the heterogeneity of the older adult population and the confounds of medical comorbidity, medication use, and functional status (Ayers *et al.*, 2007), as well as wide variations across studies in the operationalization of anxiety, the period of time measured (i.e., current, 6 months, and 12 months), and the methodology used. This high level of heterogeneity significantly reduced the ability to draw firm conclusions and also prevented the completion of a meta-analysis.

The methodological quality of this research is poor. Only five studies used random sampling to recruit RACFs/ residents or reported their sample to be representative, under half (eight studies) recruited a sample size of ≤150, five studies recruited residents from a single RACF, and eight studies either excluded residents with mild to moderate impairment or provided no information on cognitive functioning. This reduces the generalizability and accuracy of findings.

With regard to the operationalization of anxiety, studies differed in their definition of how much anxiety constituted a case. Only three studies used a specific cut-off score that delineated between 'normal' and clinically significant levels of anxiety (Kang *et al.*, 2010; Neville and Teri, 2011; Drageset *et al.*, 2013). One study based caseness on the endorsement of only a

single item from the Neuropsychiatric Inventory and the Cornell Scale for Depression in Dementia (Smith *et al.*, 2008), while another defined caseness as the presence of one or more symptom of anxiety (Smalbrugge *et al.*, 2005). Thus, it is likely that the use of more stringent criteria accounts for the lower prevalence rates found in some studies. Moreover, differences in nosologies (e.g., DSM-III or DSM-IV) are likely to have contributed to variation in rates of disorders. The use of a hierarchical approach to diagnosis by Cheok *et al.* (1996) is likely to have yielded lower prevalence estimates by excluding individuals from meeting criteria for one disorder if they also met criteria for another disorder higher in the hierarchy (e.g., depression or dementia). Given the extensive comorbidity between anxiety and both depression and dementia within the older adult population (N. D. Jeste *et al.*, 2006), the use of hierarchical rules is particularly problematic.

Another methodological limitation is the variation in the types of anxiety disorders that were included in assessments. Given the exclusion of specific conditions from estimations of overall rates of anxiety disorders (e.g., Cheok *et al.* (1996) did not assess for social anxiety disorder or agoraphobia), the prevalence rate is likely to be an underestimation.

Lastly, the use of rating scales to estimate the prevalence of anxiety disorders (Cheok *et al.*, 1996; Forsell and Winblad, 1997) and clinically significant anxiety symptoms limits the results of some studies. Their popularity is mostly likely due to their brevity and ease of administration; however, very little research has been conducted into the sensitivity and specificity of these measures within an aged care setting. The majority of the rating scales used (e.g., Hospital Anxiety and Depression Scale and Hamilton Anxiety Rating Scale) were originally developed for a younger adult population, and the cut-off scores used to determine clinically significant anxiety may not be valid in this context. Research

into the relationship between scale scores and 'gold standard' psychiatric diagnoses within this population is therefore warranted.

Directions for future research

To ensure future studies increase the generalizability of their findings, the following recommendations can be made:

(1) Future research should aim to recruit large and representative samples of aged care residents. This could be done by:
    (a) utilizing a random sampling method
    (b) recruiting participants from a number of different facilities, particularly using a stratified random sampling technique based on RACF type (e.g., nursing homes/skilled RACFs, assisted living facilities/low care, or private-/government-funded RACFs).

(2) Given that a high proportion of RACF residents have some cognitive impairment (Matthews and Dening, 2002), studies should include those with at least moderate cognitive impairment and report prevalence results separately for those with and without cognitive impairment to inform our understanding of the relationship between anxiety and cognitive functioning.

(3) Studies should use an anxiety measure that is appropriate and validated for the aged care population.

(4) As cognitive impairment affects an individual's concentration, memory, judgement, and insight into their mental health (Shankar *et al.*, 1999), and thus influences their responses to questionnaires and rating scales, measures should have been specifically developed for residents with cognitive deficits (e.g., Rating Anxiety in Dementia; Shankar *et al.*, 1999), or validated with this group, focus on the experience of anxiety symptoms in recent weeks, and include information from a caregiver or other knowledgeable informant, to improve the

reliability and validity of responses.

(5) Future studies should allow comorbid diagnoses to be made (i.e., use a hierarchy-free method of diagnosing).

(6) Each specific anxiety disorder outlined in the diagnostic nosology used should be assessed, and studies should provide details on what specific phobia subtypes/situations are most commonly endorsed.

(7) Studies should also assess for subsyndromal/ subthreshold anxiety (i.e., those instances where criteria for a full disorder have not been met, but symptom severity exceeds a threshold value determined to be clinically significant) and anxiety symptoms, as indications suggest both significantly impact on the well-being and functioning of older adults.

Conclusion

In sum, while anxiety in RACFs has not been extensively investigated, and there is substantial variation in operationalization of anxiety and methodology used, the literature suggests that anxiety disorders and symptoms are common among older adults in residential care. Compared with community-dwelling older adults, both anxiety disorders and symptoms appear to be more prevalent in the aged care population, with specific phobias and GAD being the most common disorders.

Given the variation in prevalence estimates and overall poor quality of existing studies, methodologically sound research that uses current diagnostic criteria and assesses for subsyndromal anxiety is urgently required. This will aid in the planning and development of prevention and intervention strategies, and address the lack of attention paid to anxiety within aged care settings.

Conflict of interest

None declared.

Key points

- Anxiety disorders and anxiety symptoms are common in older aged care residents.
- Prevalence estimates within the residential aged care population vary widely, with this likely to be due to the heterogeneity in methodology, operationalization of anxiety, and the number and type of anxiety disorders assessed.
- Further research is needed to help clarify how common the experience of clinically relevant anxiety is within this population, as this will aid in the planning and development of prevention and intervention strategies.

References

Alwahhabi F. 2003. Anxiety symptoms and generalized anxiety disorder in the elderly: a review. *Harv Rev Psychiatry* **11**(4): 180–193. DOI:10.1080/10673220303944.

American Psychiatric Association. 1980. Diagnostic and Statistical Manual of Mental Disorders. 3rd edn. American Psychiatric Association: Washington, DC.

American Psychiatric Association. 1987. Diagnostic and Statistical Manual of Mental Disorders. 3rd ed, revised edn. American Psychiatric Association: Washington, DC.

American Psychiatric Association. 1994. Diagnostic and Statistical Manual of Mental Disorders. 4th edn. American Psychiatric Association: Washington, DC.

Arvaniti A, Livaditis M, Kanioti E, Davis EMS, Xenitidis K. 2005. Mental health problems in the elderly in residential care in Greece— a pilot study. *Aging Ment Health* **9**(2): 142–145. DOI:10.1080/13607860412331336869.

Ayers CR, Sorrell JT, Thorp SR, Wetherell JL. 2007. Evidence-based psychological treatments for late-life anxiety. *Psychol Aging* **22**(1): 8–17. DOI:10.1037/0882-7974.22.1.8.

Beard JR, Bloom DE. 2015. Towards a comprehensive public health response to population ageing. *The Lancet* **385**(9968): 658–661.

Bland RC, Newman SC, Orn H. 1988. Prevalence of disorders in the elderly in Edmonton. *Acta Psychiatr Scand* **77**(SUPPL. 338): 57–63.

Bryant C, Jackson H, Ames D. 2008. The prevalence of anxiety in older adults: methodological issues and a review of the literature. *J Affect Disord* **109**(3): 233–250. DOI:10.1016/j.jad.2007.11.008.

Cheok A, Snowdon J, Miller R, Vaughan R. 1996. Prevalence of anxiety disorders in nursing homes. *Int J Geriatr Psychiatry* **11**(5): 405–410. DOI:10.1002/(SICI)10991166(199605)11:5<405::AIDGPS302>3.0. CO;2-O.

Class CA, Unverzagt FW, Gao S, *et al.* 1996. Psychiatric disorders in African American nursing home residents. *Am J Psychiatry* **153**(5): 677–681.

Copeland JR, Dewey ME, Wood N, *et al.* 1987. Range of mental illness among the elderly in the community. prevalence in Liverpool using the GMS-AGECAT package. *Br J Psychiatry* **150**(6): 815–823. DOI:10.1192/bjp.150.6.815.

De Bellis A. 2010. Australian residential aged care and the quality of nursing care provision. *Contemp Nurse* **35**(1): 100–113. DOI:10.5172/conu.2010.35.1.100.

De Beurs E, Beekman ATF, Van Balkom AJLM, *et al.* 1999. Consequences of anxiety in older persons: its effect on disability, well-being and use of health services. *Psychol Med* **29**(3): 583–593. DOI:10.1017/S0033291799008351

Department of Health and Ageing. 2011. Technical paper on the changing dynamics of residential aged care prepared to assist: the productivity commission inquiry into caring for older Australians. Retrieved from http://www.pc.gov.au/inquiries/completed/aged-care/residential-care-dynamics/residential-care-dynamics.pdf (Accessed 2 August 2015).

Drageset J, Eide GE, Ranhoff AH. 2013. Anxiety and depression among nursing home residents without cognitive impairment. *Scand J Caring Sci* **27**(4): 872–881. DOI:10.1111/j.1471-6712.2012.01095.x.

Anxiety among older adults in residential care

Folstein MF, Folstein SE, McHugh PR. 1975. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res* **12**(3): 189–198.

Forsell Y, Winblad B. 1997. Anxiety disorders in non-demented and demented elderly patients: prevalence and correlates. *J Neurol Neurosurg Psychiatry* **62**(3): 294–295.

Gerolimatos LA, Gregg JJ, Edelstein BA. 2013. Assessment of anxiety in long-term care: examination of the Geriatric Anxiety Inventory (GAI) and its short form. *Int Psychogeriatr* **25**(9): 1533–1542. DOI:10.1017/S1041610213000847.

Gonçalves DC, Pachana NA, Byrne GJ. 2011. Prevalence and correlates of generalized anxiety disorder among older adults in the Australian National Survey of Mental Health and Well-Being. *J Affect Disord* **132**(1–2): 223–230. DOI:10.1016/j. jad.2011.02.023.

Grenier S, Préville M, Boyer R, *et al.* 2011. The impact of DSM-IV symptom and clinical significance criteria on the prevalence estimates of subthreshold and threshold anxiety in the older adult population. *Am J Geriatr Psychiatry* **19**(4): 316–326. DOI:10.1097/JGP.0b013e3181ff416c.

Harris-Kojetin L, Sengupta M, Park-Lee E, Valverde R. 2013. Long-term care services in the United States: 2013 overview. In National Health Care Statistics Reports; No 1. National Center for Health Statistics: Hyattsville, MD.

Haugan G. 2014. Meaning-in-life in nursing-home patients: a correlate with physical and emotional symptoms. *J Clin Nurs* **23**(7–8): 1030–1043. DOI:10.1111/ jocn.12282.

Haugan G, Drageset J. 2014. The Hospital Anxiety and Depression Scale—dimensionality, reliability and construct validity among cognitively intact nursing home patients. *J Affect Disord* **165**: 8–15. DOI:10.1016/j.jad.2014.04.042.

Heun R, Papassotiropoulos A, Ptok U. 2000. Subthreshold depressive and anxiety disorders in the elderly. *Eur Psychiatry* **15**(3): 173–182. DOI:10.1016/S0924-9338(00) 00228-5.

Jervis LL, Manson SM. 2007. Cognitive impairment, psychiatric disorders, and problematic behaviors in a tribal nursing home. *J Aging Health* **19**(2): 260–274. DOI:10.1177/0898264306297191.

Jeste DV, Blazer DG, First M. 2005. Aging-related diagnostic variations: need for diagnostic criteria appropriate for elderly psychiatric patients. *Biol Psychiatry* **58**(4): 265–271. DOI:10.1016/j.biopsych.2005.02.004.

Jeste ND, Hays JC, Steffens DC. 2006. Clinical correlates of anxious depression among elderly patients with depression. *J Affect Disord* **90**(1): 37–41. DOI:10.1016/j.jad.2005.10.007.

Junginger J, Phelan E, Cherry K, Levy J. 1993. Prevalence of psychopathology in elderly persons in nursing homes and in the community. *Hosp Community Psychiatry* **44**(4): 381–383.

Kang H, Smith M, Buckwalter KC, Ellingrod V, Schultz SK. 2010. Anxiety, depression, and cognitive impairment in dementia-specific and traditional assisted living. *J Gerontol Nurs* **36**(1): 18–32. DOI:10.3928/00989134-20091204-01.

Kay DWK, Holding TA, Jones B, Littler S. 1987. Psychiatric morbidity in Hobart's dependent aged. *Aust N Z J Psychiatry* 21(4): 463–475.

Kessler RC, Brandenburg N, Lane M, *et al.* 2005. Rethinking the duration requirement for generalized anxiety disorder: evidence from the National Comorbidity Survey Replication. *Psychol Med* **35**(7): 1073–1082. DOI:10.1017/ S0033291705004538.

Kirmizioglu Y, Doan O, Kuu N, Akyüz G. 2009. Prevalence of anxiety disorders among elderly people. *Int J Geriatr Psychiatry* **24**(9): 1026–1033. DOI:10.1002/gps.2215.

Kmet LM, Lee RC, Cook LS. 2004. Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields. Alberta Heritage Foundation for Medical Research: Alberta, Canada.

Krasucki C, Howard R, Mann A. 1999. Anxiety and its treatment in the elderly. *Int Psychogeriatr* **11**(1): 25–45.

Lewinsohn PM, Shankman SA, Gau JM, Klein DN. 2004. The prevalence and co-morbidity of subthreshold psychiatric conditions. *Psychol Med* **34**(4): 613–622. DOI:10.1017/S0032291703001466.

Luppa M, Luck T, Weyerer S, *et al.* 2010. Prediction of institutionalization in the elderly: a systematic review. *Age Ageing* **39**(1): 31–38. DOI:10.1093/ageing/afp202.

Manela M, Katona C, Livingston G. 1996. How common are the anxiety disorders in old age? *Int J Geriatr Psychiatry* **11**(1): 65–70. DOI:10.1002/(SICI)10991166(199601)11:1<65::AIDGPS296>3.0. CO;2-M.

Matthews FM, Dening T. 2002. Prevalence of dementia in institutional care. *The Lancet* **360**(9328): 225–226. DOI:10.1016/S0140-6736(02)09461-8.

Moher D, Liberati A, Tetzlaff J, Altman DG. 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med* **6**(7e1000097). DOI:10.1371/journal.pmed.1000097.

Neville C, Teri L. 2011. Anxiety, anxiety symptoms, and associations among older people with dementia in assisted-living facilities. *Int J Ment Health Nurs* **20**(3): 195–201. DOI:10.1111/j.1447-0349.2010.00724.x.

Parmelee PA, Katz IR, Lawton MP. 1993. Anxiety and its association with depression among institutionalized elderly. *Am J Geriatr Psychiatry* **1**(1): 46–58.

Préville M, Boyer R, Grenier S, *et al.* 2008. The epidemiology of psychiatric disorders in Quebec's older adult population. *Can J Psychiatry* **53**(12): 822–832.

Ritchie K, Norton J, Mann A, Carrière I, Ancelin ML. 2013. Late-onset agoraphobia: general population incidence and evidence for a clinical subtype. *Am J Psychiatry* **170**(7): 790–798. DOI:10.1176/appi.ajp.2013.12091235.

Sandberg O, Gustafson Y, Brännström B, Bucht G. 1998. Prevalence of dementia, delirium and psychiatric symptoms in various care settings for the elderly. *Scand J Public Health* **26**(1): 56–62.

Selbæk G, Kirkevold Ø, Engedal K. 2007. The prevalence of psychiatric symptoms and behavioural disturbances and the use of psychotropic drugs in Norwegian nursing homes. *Int J Geriatr Psychiatry* **22**(9): 843–849. DOI:10.1002/gps.1749.

Shankar KK, Walker M, Frost D, Orrell MW. 1999. The development of a valid and reliable scale for rating anxiety in dementia (RAID). *Aging Ment Health* **3**(1): 39–49. DOI:10.1080/13607869956424.

Smalbrugge M, Pot AM, Jongenelis K, Beekman ATF, Eefsting JA. 2005. Prevalence and correlates of anxiety among nursing home patients. *J Affect Disord* **88**(2): 145–153. DOI:10.1016/j.jad.2005.06.006.

Smalbrugge M, Pot AM, Jongenelis L, *et al.* 2006. The impact of depression and anxiety on well being, disability and use of health care services in nursing home patients. *Int J Geriatr Psychiatry* **21**(4): 325–332. DOI:10.1002/gps.1466.

Smith M, Samus QM, Steele C, *et al.* 2008. Anxiety symptoms among assisted living residents: implications of the "no difference" finding for participants with and without dementia. *Res Gerontol Nurs* **1**(2): 97–104. DOI:10.3928/19404921-20080401-06.

Spitzer RL, Williams JBW, Gibbon M, First M. 1990. Structured Clinical Interview for DSM-III-R. Patient edn. American Psychiatric Press: Washington, DC.

Tolin DF, Robison JT, Gaztambide S, Blank K. 2005. Anxiety disorders in older Puerto Rican primary care patients. Am J Geriatr Psychiatry 13(2): 150–156. DOI:10.1176/appi.ajgp.13.2.150.

Weissman MM, Myers JK, Tischler GL, *et al.* 1985. Psychiatric disorders (DSM-III) and cognitive impairment among the elderly in a U.S. urban community. *Acta Psychiatr Scand* **71**(4): 366–379.

World Health Organization. 1999. Schedules for Clinical Assessment in Neuropsychiatry (SCAN). In SCAN 2.1; vragenschema's voor de klinische beoordeling in de neuropsychiatrie, Giel R, Nienhuis FL (eds.). Dutch edn. Swets and Zeitlinger: Groningen.

Zuidema SU, Derksen E, Verhey FRJ, Koopmans RTCM. 2007. Prevalence of neuropsychiatric symptoms in a large sample of Dutch nursing home patients with dementia. *Int J Geriatr Psychiatry* **22**(7): 632–638. DOI:10.1002/gps.1722.

2.3.   Summary and Conclusion

In this chapter, an overview of the literature on the prevalence of anxiety disorders and symptoms in RACFs was provided, with key conceptual and methodological limitations outlined. Based on the findings of this review, the overall prevalence rate of anxiety disorders in RACFs range between 3.2% to 20.0%, while the prevalence rate of anxiety symptoms range from 6.5% to 58.4%. With regards to specific anxiety disorders, GAD and specific phobias appeared to be the two most common disorders within this setting, while agoraphobia, social anxiety disorder (SAD), and panic disorder were relatively uncommon, but also infrequently studied.

A key limitation of the current literature on the prevalence of anxiety in RACFs was the overall lack of attention given to this clinical issue. Specifically, only 18 studies were found to examine the occurrence of anxiety disorders or symptoms within this setting, with only one being conducted in Australian RACFs (Cheok et al., 1996) and only two studies conducted in the last five years (none of which utilised the current DSM-5 (American Psychiatric Association [APA], 2013) criteria). Moreover, there was a high level of heterogeneity with regards to reported prevalence estimates, which limited our ability to draw firm conclusions and suggests the precision of the prevalence measurement was not very accurate. Methodological reasons for the broad prevalence rates across studies included small sample sizes, wide variations with regard to the operationalization of clinically significant anxiety and the types of anxiety disorders included in assessments, the time period measured (i.e., current, 6-month, or 12-month anxiety disorders), and the use of different (and now outdated) diagnostic criteria. These limitations, combined with a range of sampling issues (e.g., recruitment of participants from only one RACF and exclusion of residents with cognitive impairment), reduces the overall generalisability and accuracy of the findings, highlighting the need for further research on the prevalence of anxiety within the current cohort of older adults.

This review sets the context for the first empirical paper (*Chapter six*) on the prevalence, recognition and management of anxiety disorders in aged care settings, and highlights the high rate, but lack of attention given to this condition within this population. The findings of this review indicated that to gain a more detailed and accurate understanding of anxiety in RACFs, both threshold and subthreshold anxiety disorders needed to be assessed using current DSM-5 (APA, 2013) criteria. Moreover, given the high prevalence of anxiety in RACFs, it was considered important to identify

the most commonly used measures used to assess anxiety symptoms within aged care settings, and determine their appropriateness for this population. Thus, in the next chapter (*Chapter three*), the second systematic literature review is presented, which provides an overview of the psychometric properties of the four most commonly used anxiety measures within RACFs.

DECLARATION BY CANDIDATE

In the case of Chapter three, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Study conceptualisation, identification, screening, analysis, and interpretation of relevant literature, and preparation of manuscript.	75

The following co-authors contributed to the work:

Name	Nature of contribution
Dr. Tanya Davison	Provided guidance on the interpretation of literature and write-up, as well as the reading of drafts of the manuscript and provision of feedback and suggestions.
Professor David Kissane	Provided guidance on the interpretation of literature and write-up, as well as the reading of drafts of the manuscript and provision of feedback and suggestions.

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work:

Candidate's Signature		Date 15/01/2018

Main Supervisor's Signature		Date 15/01/2018

CHAPTER THREE

THE ASSESSMENT OF ANXIETY IN AGED CARE RESIDENTS: A SYSTEMATIC REVIEW OF THE PSYCHOMETRIC PROPERTIES OF COMMONLY USED MEASURES

3.1. PREAMBLE TO REVIEW PAPER TWO

This chapter presents the second review of this thesis, which consists of an examination of the literature to identify the measures of anxiety most commonly used with elderly RACF residents, and determine whether psychometric data support their use with this complex and frail population. Specifically, the review focused on the four most commonly used measures identified from a review of the literature, with these being the Rating Anxiety in Dementia Scale (RAID), the anxiety subscale of the Hospital Anxiety and Depression Scale (HADS-A), the State-Trait Anxiety Inventory (STAI), and the Geriatric Anxiety Inventory (GAI). Although previous reviews had been conducted to identify frequently used anxiety measures within the general elderly population (Therrien & Hunsley, 2012), prior to this review no thorough examination identifying the use of specific assessment tools within RACFs and whether they are psychometrically appropriate had been conducted. Given the reported high rates of anxiety disorders and symptoms found in the review of the prevalence of anxiety within aged care settings (presented in *Chapter two*), it was considered important to identify which measures were being used to assess for anxiety within this population and determine the support for their reliability, validity, and overall utility. This chapter also provides an introduction and rationale for the second empirical paper (*Chapter seven*), which examines the psychometric properties and sensitivity and specificity of three commonly used anxiety measures within a RACF sample.

The following paper has been published by *International Psychogeriatrics*, a peer-reviewed journal with an impact factor of 2.423 (ISI Web of Science, 2017). While the table and figure numbers in the review have been amended to generate a consistent presentation and order within the thesis, the manuscript included in this chapter has been presented in the style of the journal's submission requirements. This paper has been reprinted with permission, as outlined in the Cambridge University Press Terms and Conditions for Authors.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2017). The assessment of anxiety in aged care residents: A systematic review of the psychometric properties of commonly used measures. *International Psychogeriatrics*, 1-13. doi: 10.1017/S1041610217002599

REVIEW

The assessment of anxiety in aged care residents: a systematic review of the psychometric properties of commonly used measures

Alexandra S. Creighton,[1,2] Tanya E. Davison[2,3] and David W. Kissane[2]

[1] School of Psychological Sciences, Monash University, Clayton, Victoria, Australia
[2] Department of Psychiatry, Monash University, Clayton, Victoria, Australia
[3] Institute for Health & Ageing, Australian Catholic University, Melbourne, Victoria, Australia

ABSTRACT

Background: Assessing anxiety among residential aged care facility (RACF) residents is challenging, and it cannot be assumed that valid and reliable measures used within the community are also appropriate for this setting. This review systematically examined the literature to identify which anxiety measures were most commonly used with older adults in RACFs, and determine whether psychometric data support their use within this population.

Methods: Using the PRISMA guidelines, five electronic databases were searched using key terms and subject headings. The search was limited to literature published in English. Eligible studies utilized an anxiety measure to assess anxiety symptoms among RACF residents. Based on the findings of this search, a critical review of the research into the reliability, validity, and administrative and respondent burden of the most commonly used measures (i.e. used in four or more studies) was conducted.

Results: In total, 1,771 articles were identified, with 50 studies included in this review. Overall, 22 measures were used, with the majority of studies utilizing a clinician-administered or self-report measure. The RAID, HADS, STAI, and GAI were the most commonly used measures. While overall there is a lack of research and consensus into the psychometric properties of these measures within RACFs, strongest evidence of reliability and validity was found for the GAI.

Conclusion: Commonly used measures of anxiety within aged care populations are not well validated for this complex subsample of older adults. Strengths and weaknesses of each measure with regards to their usefulness in aged care settings are discussed, with future research areas highlighted.

Key words: residential aged care, nursing home, long-term care, screening, assessment, anxiety, assessment measures

Background

Anxiety is one of the most common psychological disorders affecting older adults (Gonçalves *et al*., 2011). Residents of aged care facilities (also known as nursing homes, hostels, assisted living facilities, or long-term care/residential homes) are at a particularly high risk of anxiety; with prevalence rates for anxiety disorders and symptoms estimated to be between 3.2% and 20% and 6.5% and 58.4%, respectively (see Creighton *et al*., 2015 for a review). Given the high occurrence of this condition and its strong association with factors such as increased pain, greater functional impairment, and lower quality of life (Creighton *et al*., 2016), accurate assessment of anxiety within this population is vital to ensure appropriate and timely diagnosis and treatment.

A. S. Creighton *et al*.

Databases: Scopus, Ovid MEDLINE, PsycINFO, CINAHL, Cochrane.

Search:

(anxiety OR anxiety symptoms OR subthreshold anxiety OR subsyndromal anxiety)

AND

(assessment OR screening OR measurement)

AND

(nursing AND home* OR aged care OR assisted living OR residential care)

Figure 3.1. Search terms and strategy.

However, the psychological assessment of older adults in residential aged care facilities (RACFs) is challenging. Sensory deficits, medical comorbidities, and cognitive impairment, which are common in this population, can affect the presentation of anxiety, and it is difficult to distinguish between medical and psychological causes (Edelstein *et al*., 2007; Therrien and Hunsley, 2012). For instance, behaviors such as pacing, restlessness, and avoidance, may potentially indicate anxiety or agitation related to dementia (Kogan *et al*., 2000), which is common in RACF settings. Similarly, physiological signs of anxiety in this population (e.g. shortness of breath, palpitations) are also common symptoms of many physical health conditions (e.g. cardiovascular disease, hyperthyroidism) that increase with advancing age (Kogan *et al*., 2000) or can be a side-effect of medications prescribed to older adults. Given these challenges, the need for accurate and reliable measures of anxiety for use in the RACF setting is critical.

To date, reviews have been conducted identifying the most commonly used anxiety measures for the older adult (i.e. aged 65 years and over) population as a whole (Kogan *et al*., 2000; Edelstein *et al*., 2007; Therrien and Hunsley, 2012), but none specifically examined the use of anxiety measures in RACFs. As aged care residents are typically older and more cognitively and functionally impaired (Australian Institute of Health and Welfare (AIHW), 2015), it cannot be assumed that anxiety measures that are valid and reliable within the community are also appropriate for the RACF setting. Thus, using a similar methodology as Therrien and Hunsley (2012), this review aimed to examine

current research to identify which anxiety measures are most commonly used, and determine the extent to which there is psychometric data to support their use in RACFs, to provide further insight into their accuracy, validity and reliability.

Method

Identification of relevant literature

Guided by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA; Moher *et al*., 2009), five databases (Scopus, Ovid MEDLINE, PsycINFO, CINAHL, and Cochrane) were searched on 21 February 2017 using the search terms and limiters outlined in Figure 3.1.

Eligibility criteria

To the authors' knowledge, no review has been conducted on the literature with the aim of identifying the most commonly used measures of anxiety among older adults in RACFs. Thus, all studies published from inception to February 2017 were considered if they met the following inclusion criteria:

1. the study was empirical and used an anxiety measure to assess anxiety symptoms;
2. included data on RACF residents aged 50 years or older; and
3. published in English, in a peer-reviewed journal.

Study selection and data extraction

Using the systematic review software Covidence, all references returned by electronic searches were examined for duplicates and screened by title and abstract.

The full text for potential studies was then sourced and examined to determine suitability for inclusion.

For each included study, information was collected on the country where it was conducted, year of publication, anxiety measure used, and the purpose for which it was utilized. The authors also noted whether the researchers commented on the suitability of the selected measure for older adults, or the RACF population in particular.

Similar to Therrien and Hunsley (2012), due to the large number of measures used in the literature, this review focused on those instruments that were used in four or more studies. As the majority of measures were used by only one to two studies each, including studies of measures used so infrequently would likely have been of little relevance for both research and clinical settings.

By limiting the focus on tools described in at least four studies allowed for a more detailed assessment of the psychometric properties of measures that were frequently used with older adults. For each measure, information on its reliability, validity, acceptability in terms of respondent burden, and feasibility in terms of administrative burden was extracted from the included studies and instrument manuals. Evidence of treatment sensitivity was derived from studies that utilized the measure to examine the effects of mental health treatments in RACF residents. The standards for summarizing the quality of assessment measures were adapted from Andresen's (2000) overview of criteria for assessing instruments (see Table 3.1).

Results

The search returned 1,771 articles (Figure 3.2). After removal of duplicates and addition of 11 papers identified through other sources, 1,686 studies remained. These were screened by title and abstract, after which 73 articles were retained for further examination. The full texts of these papers were then assessed for eligibility, with 50 studies included in this review. Figure 3.2 outlines the process of study selection and reasons for exclusion.

Participant and study characteristics

The review yielded studies conducted between 1992 and 2016, from 19 countries (United States of America ($n = 9$); Netherlands ($n = 8$);

Norway ($n = 8$); United Kingdom ($n = 7$); Australia ($n = 6$); Sweden ($n = 3$); Germany, France, Taiwan, Japan ($n = 2$); and Spain, Singapore, Estonia, Belgium, Portugal, Italy, Finland, Malta, and Argentina ($n = 1$)). Forty-two studies (84.0%) recruited their sample from RACFs only, while eight (16.0%) recruited from RACFs and community and/or medical settings. Sample sizes ranged from 17 (Smith *et al*., 2008) to 1,322 RACF residents (Zuidema *et al*., 2007). One study (Selwood *et al*., 2005) did not report the number of RACF residents included.

Commonly used measures of anxiety in RACFs

Overall, 22 measures were used in the 50 studies, with 15 (68.2%) used in only one or two studies. Seven measures were specific to anxiety, nine assessed anxiety using a subscale, five used a single-item, and one was originally developed to assess depression only. Overall, seven instruments employed clinician-administered interviews (31.8%), while two (4.5%) measures consisted of an observational scale completed by the clinician. Six (27.3%) measures were completed by the residents themselves (i.e. self-report), while three (13.6%) were completed by a staff member. While over half of included studies suggested that the measure used to assess anxiety was appropriate for older adults (30 studies; 60.0%), only 10 (20.0%) reported whether age-relevant norms were available. Moreover, only six studies (12.0%) proposed that the measure was appropriate for RACF residents in particular. Further information on the specific measures used across studies can be obtained from the authors upon request.

Based on the findings of this systematic search, only four measures were found to be used in at least four studies within aged care settings: the Rating Anxiety in Dementia scale (RAID; Shankar *et al*., 1999; 10 studies); anxiety subscale of the Hospital Anxiety and Depression Scale (HADS-A; Zigmond and Snaith, 1983; nine studies); State-Trait Anxiety Inventory (STAI; Spielberger *et al*., 1983; four studies); and the Geriatric Anxiety Inventory (GAI; Pachana *et al*., 2007; four studies).

The remainder of this review focuses on these measures, with details about the characteristics of each instrument, as well as their psychometric properties and utility in detecting anxiety in the RACF population,

A. S. Creighton *et al.*

Table 3.1. Criteria for rating psychometric properties and clinical utility of assessment measures (Andresen, 2000)

DOMAIN	MEASUREMENT PROPERTY	DEFINITION	STANDARD
Reliability		The degree to which the tool provides a consistent answer and is free from random error	
	Internal consistency	The degree of interrelatedness among the items	• Cronbach's alpha (α) and Kuder–Richardson 20 coefficient (KR-20) for internal consistency ratings: excellent (≥ 0.80); adequate (0.70–0.79); poor (≤ 0.69)
	Inter-rater	The extent to which scores for patients who have not changed are the same for repeated measurements by different persons on the same occasion	• ICC and κ for intra/inter and test-retest ratings: excellent (≥ 0.75); adequate (0.40–0.74); poor (≤ 0.39)
	Test-retest	The extent to which scores for patients who have not changed are the same for repeated measurements over time	• ICC and κ for intra/inter and test-retest ratings: excellent (≥ 0.75); adequate (0.40–0.74); poor (≤ 0.39)
Validity		The degree to which a tool measures what it purports to measure	
	Construct validity	The degree to which the scores of a measure are related to scores of another measure that is supposed to assess the same construct (convergent validity), and is independent of those scores on measures that are supposed to be unrelated (discriminant validity)	• Correlations: excellent (≥ 0.60); adequate (0.30–0.59); or poor (≤ 0.29) for convergent validity • Discriminant validity evidenced by correlations <0.30
		Factorial validity examines the extent to which the underlying structure of a scale is recoverable in group of test scores	• Construct factorial confirmation: excellent (has been confirmed within RACF sample); moderate (few problems identified); poor (weak or not confirmed)
	Criterion validity	The degree to which the scores of a measure are an adequate reflection of a "gold standard"; sensitivity is the ability of the test to correctly identify those with the disorder; specificity is the ability of the test to correctly identify those without the disorder	• ROC analysis – AUCs are as follows: excellent (≥ 0.90); adequate (0.70–0.89); poor (≤ 0.69)
Respondent burden		Ease of completing the instrument	• Excellent: completion time ≤ 5 minutes • Adequate: completion time between 6 and 15 minutes • Poor: completion time ≥ 16 minutes
Administrative burden		Ease of administering, scoring, and interpreting the instrument	• Excellent: self-report, scoring by hand, and the resulting metric is relevant and interpretable for researchers and clinicians • Adequate: interview, computer scoring, and more obscure interpretation • Poor: costly and/or complex scoring and/or interpretation

Note. ICC, Intra-class correlations; ROC, Receiver operating characteristics; AUCs, Area under the Curves.
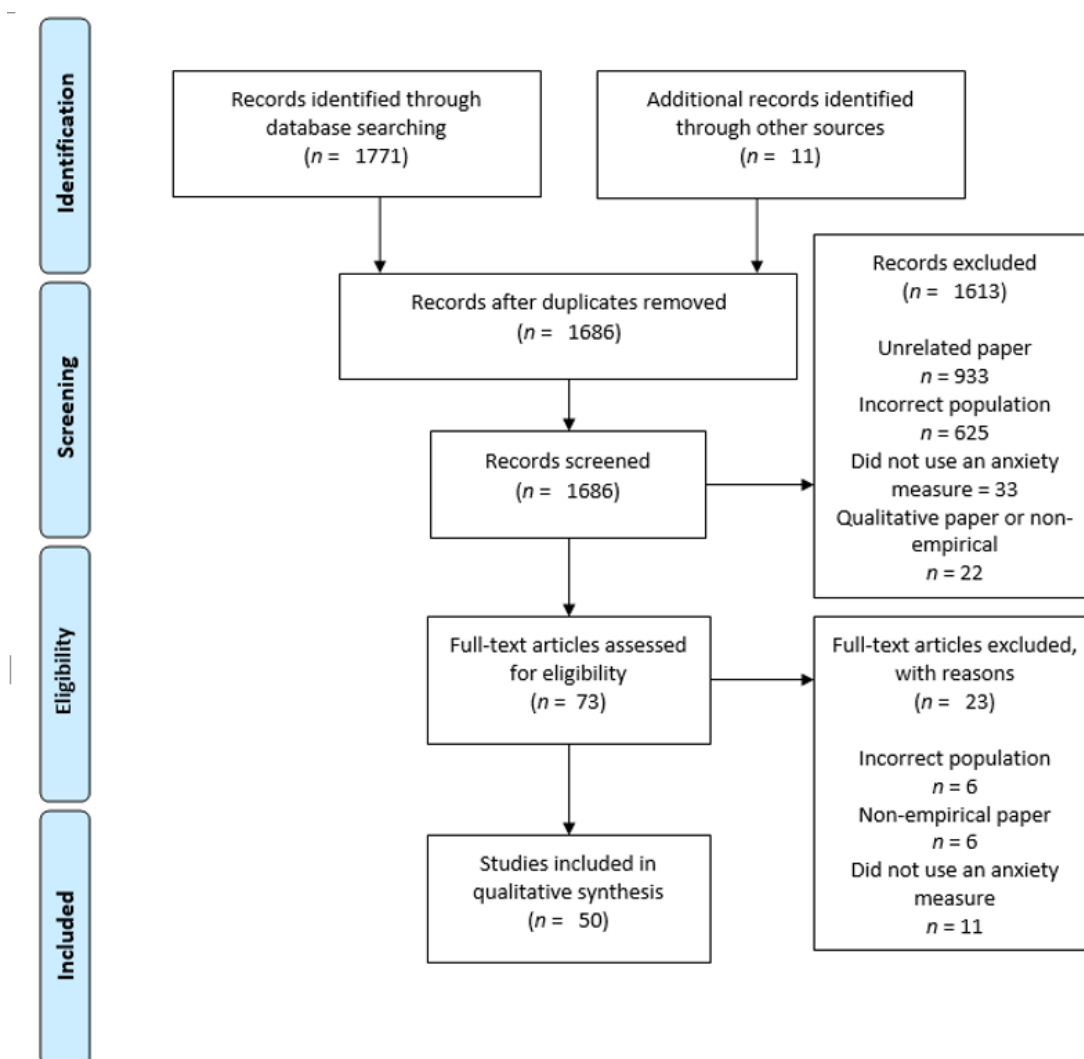
Figure 3.2. Flowchart depicting study selection

being provided (see Table 3.2).

Psychometric evaluation of measures

RATING ANXIETY IN DEMENTIA SCALE

The RAID (Shankar *et al*., 1999) is an 18-item clinical rating scale specifically developed to assess anxiety symptoms over the last two weeks in people with dementia. The measure is completed by the clinician using information from interviews conducted with the patient and an informant, and consists of four subscales: worry, apprehension and vigilance, motor tension, and autonomic hypersensitivity. Scores range from 0 to 54, with each item rated on a scale of 0 (absent) to 3 (severe). Higher scores indicate higher levels of anxiety. The RAID takes approximately 20 minutes to complete (10-minute interview

with the informant, and 10-minute interview with the patient), and so rates poor on administrative burden and adequate on respondent burden. In previous research, the RAID has been used and validated with dementia patients in inpatient wards, day centers, hospitals, and geriatric clinics (Shankar *et al*., 1999; Twelftree and Qazi, 2006; Snow *et al*., 2012).

Within RACFs, the RAID was the most commonly used anxiety measure (10 studies; Selwood *et al*., 2005; Hancock *et al*., 2006; Smith *et al*., 2008; Cooke *et al*., 2010; Sung *et al*., 2010; Neville and Teri, 2011; Azcurra, 2012; Sung *et al*., 2012; Wenborn *et al*., 2013; Goyal *et al*., 2016). However, only one study (Goyal *et al*., 2016) was conducted with the specific purpose of assessing its psychometric properties (Table 3.2). In 101 Norwegian RACF residents (28 of whom met DSM-5

A. S. Creighton *et al*.

criteria for GAD), the RAID was found to have strong internal consistency ($\alpha = 0.81$) and inter-rater reliability ($n = 53$, ICC = 0.82), with a total score of ≥ 11 and ≥ 12 resulting in agreement between the two raters 79.2% of the time (Cohen's = 0.58). Participants with GAD had significantly higher mean RAID scores than those without, and while a strong correlation with the Cornell Scale for Depression in Dementia (CSDD; Alexopoulos *et al*., 1988) was found, less than half the variance in the RAID was explained by the CSDD ($r = 0.65$, $r^2 = 0.42$). This suggests the RAID is measuring symptoms of anxiety that are separate to those that often overlap with depression. Finally, a ROC analysis found the AUC to be adequate (0.80) in diagnosing GAD in residents with dementia, with cut-offs of ≥ 11 and ≥ 12 giving good sensitivity (85.7%, 82.1%) and adequate specificity (67.1%, 70.0%).

All studies using the RAID within RACFs utilized a cut-off of ≥ 11 to indicate significant anxiety, with four studies reporting the RAID's internal consistency; which ranged from adequate to excellent (Table 3.2). Evidence of inter-rater reliability was provided by Sung *et al*. (2010), who found an agreement of 90% when using the cut-off score of ≥ 11. Smith *et al*. (2008) found the RAID significantly correlated with the Hamilton Anxiety Rating Scale (Hamilton, 1959) ($r = 0.79$), which provides some indication of excellent convergent validity within RACFs. Four studies utilized the RAID to assess the effects of psychological interventions on anxiety in RACF residents (Cooke *et al*., 2010; Sung *et al*., 2010; Sung *et al*., 2012; Wenborn *et al*., 2013), with two finding significant decreases in anxiety post-participation in a music intervention and when compared to a control group. Thus, there is some evidence that the RAID can be sensitive to treatment effects in RACFs.

HOSPITAL ANXIETY AND DEPRESSION SCALE – ANXIETY SUBSCALE

The HADS-A (Zigmond and Snaith, 1983) is a seven-item subscale that measures the presence and severity of anxiety over the last week. It is a self-report measure that was originally developed to detect clinically significant anxiety in adults attending medical outpatient clinics, and so excludes somatic symptoms. Each item is rated from 0 to 3, with scores on the subscale ranging from 0 to 21. In the original study by Zigmond and Snaith

(1983), recommended cut-off scores were 7/8 for possible anxiety and 10/11 for probable anxiety, with higher scores indicating higher levels of anxiety. Given the HADS-A comprises a small number of items, administrative and respondent burden is considered excellent. However, due to the prevalence of medical/cognitive impairments in the older adult population, studies have found that many participants require assistance completing the measure (e.g. Davies *et al*., 1993).

Within RACF-based research, the HADS-A was found to be the second most commonly used measure of anxiety (nine studies; Haslam *et al*., 2010; Richmond *et al*., 2011; Dozeman *et al*., 2012; Baldacchino and Bonello, 2013; Drageset *et al*., 2013; Bosmans *et al*., 2014; Haugan and Drageset, 2014; Drageset *et al*., 2015; Haugan, 2015). Despite its popularity, only one study examined its psychometric properties in RACFs (Haugan and Drageset, 2014) (Table 3.2). Specifically, among 429 cognitively intact Dutch RACF residents (sample 1 had $n = 227$; sample 2 had $n = 202$), the internal consistency of the HADS-A ranged from poor to excellent ($\alpha = 0.65$–0.83), while composite reliability was reported to be good ($\rho c = 0.78$–0.83). In terms of discriminant validity of the subscale, the authors reported moderate correlations with sense of coherence ($r = -0.44$), health-related quality of life ($r = -0.38$), quality of life ($r = 0.30$), and meaning in life ($r = -0.45$), but low negative correlations with measures of social support ($r = -0.19$), hope ($r = -0.28$) and self-transcendence ($r = -0.25$). Finally, Haugan and Drageset (2014) reported moderate evidence for the factorial validity of the HADS. Specifically, while the original 2-factor model of the HADS was found to be a good fit in sample 1, in sample 2, this model was found to be a poor fit. Moreover, one item of the HADS-A subscale (I feel restless as if I have to be on the move) was also reported to have a relatively low factor loading (0.45) with the construct of anxiety.

Only two other studies included in this review reported the internal consistency of the HADS-A, which ranged from adequate to excellent ($\alpha = 0.78$–0.85; Drageset *et al*., 2013; Haugan, 2015).

To the authors' knowledge, no research has been conducted into the sensitivity and specificity of the HADS-A in RACF residents, and the lack of a known clinical cut-score was

Table 3.2. Psychometric properties of the RAID, HADS-A, STAI, and GAI in RACF samples

MEASURE	AUTHOR(S)	RELIABILITY	CONVERGENT VALIDITY	DISCRIMINANT VALIDITY	FACTORIAL VALIDITY	SENSITIVITY/ SPECIFICITY	ROC ANALYSIS – AUC
RAID	Cooke et al. (2010)	Cronbach's α = 0.91	Not examined	Not examined	Not examined	Not examined	Not examined
	Sung et al. (2010); Sung et al. (2012)	Cronbach's α = 0.73, IRR = 90%	Not examined	Not examined	Not examined	Not examined	Not examined
	Goyal et al. (2016)	Cronbach's α = 0.81, ICC = 0.82	Not examined	CSDD: r = 0.65	Not examined	Sensitivity = 82.1%, Specificity = 70.0%, Cut-off = 12	0.80
HADS-A	Smith et al. (2008)	Not reported	HARS: r = 0.79	Not examined	Not examined	Not examined	Not examined
	Drageset et al. (2013)	Cronbach's α = 0.85	Not examined	Not examined	Not examined	Not examined	Not examined
	Haugan (2015)	Cronbach's α = 0.78	Not examined	Not examined	Not examined	Not examined	Not examined
	Haugan and Drageset (2014)	Cronbach's α = 0.65–0.83	Not examined	OLS: r = −0.443 RSPS: r = −0.192 SF-36: r = −0.383 PIL: r = −0.450 HHI: r = −0.282 STS: r = −0.247 QLQ-C15-PAL[a]: r = −0.303	CFA revealed moderate support for original two-factor model of HADS; sample 1 found to have good model fit, while sample 2 was poor. Item 11 of HADS-A found to have only a fair level of loading with the anxiety factor (loading = 0.49)	Not examined	Not examined
STAI	Keister (2006)	Cronbach's α = 0.93	Not examined	Not examined	Not examined	Not examined	Not examined
GAI	Boddice et al. (2008)	Not reported	CIDI: φ = 0.875	Not examined	Not examined	% correct[b] = 80.0%, Cut-off = 9	Not examined
STAI	Davison et al. (2016)	Cronbach's α = 0.89	Not examined	GDS-15: r = 0.42, EXIT: r = 0.21, AFABS: r = −0.29, Age: 0.01	Not examined	Not examined	Not examined
	Gerolimatos et al. (2013)	Cronbach's α = 0.92	Not examined	Not examined	Not examined	Sensitivity = 100.0%, Specificity = 60.0%, Cut-off = 9, % correct[b] = 65.3%	0.78

Note. ROC, Receiver Operating Curve; AUC, Area under the Curve; RAID, Rating Anxiety in Dementia Scale; IRR = Inter-rater reliability; ICC, Intra-class coefficient; HARS, Hamilton Anxiety Rating Scale; HADS-A, Hospital Anxiety and Depression Scale – Anxiety Subscale; CSDD, Cornell Scale for Depression in Dementia; OLS, Orientation to Life Scale; RSPS, Revised Social Provisions Scale; SF-36, Short-Form Health Survey; PIL, Purpose in Life Test; HHI, Herth Hope Index; STS, Self-Transcendence Scale; QLQ-C15-PAL, Cancer Quality of Life Questionnaire Core 15 Palliative Tool; CFA, Confirmatory factor analysis; STAI, State-Trait Anxiety Inventory; GAI, Geriatric Anxiety Inventory; CIDI, Composite International Diagnostic Interview; GDS-15, Geriatric Depression Scale-15 item; EXIT, Executive Interview; AFABS, Adult Functional Adaptive Behavior Scale.
[a]Global quality-of-life assessed by one-item from the QOL-C15-PAL.
[b]% correct = is the percentage of all participants in the study who met diagnostic criteria for an anxiety disorder and were correctly classified as having an anxiety disorder based on the cut-off score.

evidenced by variable cut-offs used across studies to determine anxiety cases. Specifically, Dozeman *et al*. (2012) used a score of ≥8 as a cut-off for an anxiety disorder, while Drageset *et al*. (2015) and Drageset *et al*. (2013) used a score of 8–10 to indicate possible cases of anxiety, and ≥11 to indicate cases that require further investigation and possible treatment. This lack of consistency replicates the findings of non-RACF studies, where the utilization of the HADS-A subscale as a case-finding instrument is concerning, as demonstrated by variable sensitivity, specificity, and optimal cut-off scores (Spinhoven *et al*., 1997; Bryant *et al*., 2009; Roberts *et al*., 2014). Moreover, the treatment sensitivity of the HADS-A in RACF residents is also unknown, with none of the studies assessing mental health interventions finding significant results.

STATE-TRAIT ANXIETY INVENTORY

The STAI (Spielberger *et al*., 1983) is a 40-item self-report measure originally designed to assess general anxiety in young and middle-aged adults. It contains two 20-item subscales measuring state (transient) and trait (enduring) anxiety using a four-point Likert scale. Scores range from 20 to 80, with higher scores indicating higher levels of anxiety.

To the authors' knowledge, no research has been conducted with the specific aim of examining the psychometric properties of the STAI in RACFs. To date, it appears that only Keister (2006) has reported psychometric information on the STAI within an aged care setting, with the author finding the measure to have excellent internal consistency within their sample. Research into its use with other older adult populations has produced mixed results. Internal consistency has been reported to range from adequate to excellent among community-dwelling older adults (Stanley *et al*., 1996; Stanley *et al*., 2001; Twelftree and Qazi, 2006; Bergua *et al*., 2012; Bergua *et al*., 2016) and geriatric mental health patients (Ward *et al*., 1994; Kabacoff *et al*., 1997; Twelftree and Qazi, 2006). Overall test-retest reliability has ranged from adequate to excellent for the trait subscale ($r = 0.58$–0.84) and adequate for the state subscale ($r = 0.51$–0.62; Stanley *et al*., 1996; Stanley *et al*., 2001). Evidence of convergent validity for the STAI-state and trait subscales is mixed, with some studies reporting it to be adequate for both subscales (Kabacoff *et al*., 1997; Stanley *et al*.,

2001), while Stanley *et al*. (1996) found the state subscale did not correlate with other anxiety measures among older adults with GAD. Discriminant validity is also questionable, with both subscales found to correlate with depression measures (Stanley *et al*., 2001; Potvin *et al*., 2011), and Kabacoff *et al*. (1997) finding the state subscale failed to differentiate between older adults with and without a diagnosed anxiety disorder. Finally, several cut-off scores have been proposed, with no real consensus reached (Kvaal *et al*., 2005; Dennis *et al*., 2007).

Despite the absence of research into the STAI's psychometric properties in RACF residents, the measure was used in four aged care studies (Nagatomo *et al*., 1995; Lin and Taylor, 1998; Keister, 2006; Leong and Nuo, 2007). Various cut-offs to determine significant levels of anxiety were used across studies. For example, Leong and Nuo (2007) used a cut-off of ≥38 for female RACF residents and ≥40 for male residents, while Nagatomo *et al*. (1995) used a cut-off of ≥45 for females and ≥44 for males.

Some evidence that the STAI may be sensitive to treatment effects in RACF residents was provided by Lin and Taylor (1998), who found a significant decrease in STAI-state scores post-intervention (when compared to pre-intervention scores) in 21 RACF residents with chronic pain after a therapeutic touch intervention. However, the authors reported respondent burden, with 75% of participants finding completion of the STAI stressful. In contrast, administrative burden in the RACF setting is likely to be excellent, given the self-report format (with no staff involvement necessary) and ability to be hand-scored by the clinician.

GERIATRIC ANXIETY INVENTORY

The GAI (Pachana *et al*., 2007) is a 20-item self-report screening tool which, using language commonly utilized by older adults to describe anxiety (e.g. "nerves", "butterflies in my stomach"), assesses the presence of generalized anxiety symptoms over the past week. Each item uses a dichotomous agree/disagree format to facilitate its use with individuals with mild cognitive impairment and lower levels of education. Scores range from 0 to 20, with higher scores indicating higher levels of anxiety (Pachana *et al*., 2007). Only two studies were found to specifically examine the GAI's psychometric properties

with RACF residents, with one examining reliability, discriminant validity, sensitivity, and specificity (Gerolimatos *et al*., 2013), and one examining the GAI's predictive validity (Boddice *et al*., 2008) (Table 3.2). Gerolimatos *et al.* (2013) found excellent internal consistency ($\alpha = 0.92$), with Davison *et al.* (2016) also finding high internal reliability in their sample of 41 residents ($\alpha = 0.89$). To the authors' knowledge, the GAI's test-retest and inter-rater reliability in RACFs is unknown, but research in non-RACF samples have reported it to be excellent (test-retest after one week: $r = 0.86$–0.91; inter-rater reliability: $r = 0.89$–0.99; Pachana *et al*., 2007; Rozzini *et al*., 2009). Boddice *et al*. (2008) reported excellent discriminant validity in RACFs, with weak correlations between the GAI and measures of executive function ($r = 0.21$) and functional behaviors ($r = -0.29$). A moderate significant correlation with the Geriatric Depression Scale was found ($r = 0.42$) but was reported to be expected given the conceptual overlap of anxiety and depression. A ROC analysis by Gerolimatos *et al*. (2013) found the AUC for the GAI to be adequate (AUC = 0.79), with a cut-off of ≥9 being found to provide optimal sensitivity and specificity to discriminate between individuals who met criteria for at least one anxiety diagnosis. Moreover, the measure's predictive validity has also been reported to be good within RACFs, with Boddice *et al*. (2008) finding a cut-off of ≥9 correctly identifying 80.0% (four out of five) of residents who met criteria for a DSM-IV anxiety disorder. This is similar to more recent findings in non-RACF samples, with studies reporting a score of 8/9 to have the highest sensitivity and specificity (AUC = 0.90–0.98; Diefenbach *et al*., 2009; Byrne *et al*., 2010; Johnco *et al*., 2015) in identifying individuals with an anxiety disorder. Finally, evidence of the GAI's treatment sensitivity in RACFs is demonstrated by Davison *et al*. (2016) and Lopes *et al*. (2016), with the studies using the GAI to assess the effect of acceptance and commitment therapy and reminiscence therapy on anxiety symptoms, respectively. Both studies reported a decline in scores on the GAI post-treatment, with Lopes *et al*. (2016) finding a significant difference between the experimental and control group post-treatment.

Assessment of anxiety in aged care residents

Discussion

This review aimed to identify the most commonly used measures of anxiety in RACF residents, and determine their appropriateness for use with this population by examining their psychometric properties, and respondent and administrative burden. Overall, a lack of consistency in the assessment of anxiety is evident, with 22 different tools used across 50 studies.

While most authors reported that the anxiety measure they selected was appropriate for older adults, only six articles explicitly referred to its suitability for RACF residents, in particular. Surprisingly, of the four most commonly used measures in the literature, only two (RAID and GAI) were specifically developed for older adults, with many researchers relying instead on measures developed for younger populations. Some measures are heavily weighted with somatic items (e.g. Beck Anxiety Inventory, STAI, Goldberg Anxiety Scale), and so may be problematic for use with the RACF population. While there is some research supporting the use of these measures with older adults in community and primary care settings, there are significant differences between community and aged care-dwelling older adults, with RACF residents being substantially older, and more cognitively and functionally impaired (AIHW, 2015). Thus, the assessment of anxiety in RACFs using these measures is likely to be challenging and further complicated by age-related differences in anxiety presentation and high rates of medical comorbidities (Kogan *et al*., 2000). Further research is therefore urgently needed to gather evidence to support the use of existing measures or else to develop new measures to accurately assess anxiety in this growing population.

A key finding of this review is the overall lack of research into the psychometric properties of the anxiety measures currently used within RACFs. Among the three most commonly used measures, the RAID and HADS-A had only one study each investigating their psychometric appropriateness within RACFs, while the STAI had none. In contrast, the GAI had two studies conducted with the primary aim of examining its psychometrics within an aged care population, and was only used in two additional studies. Thus, when considering the evidence for the reliability, validity,

sensitivity, and specificity of these measures within RACFs (as discussed below), it must be noted that existing data come from only one to two published studies. This limits the generalizability and reliability of both psychometric findings and the findings from other empirical studies that used the measure within this population. With regards to reliability, internal consistency was found to range from adequate to excellent across all measures, with the GAI having the strongest internal reliability within RACF samples. Inter-rater reliability in RACFs was reported for the RAID only (and found to be excellent), while no aged care studies had examined the test-retest reliability of any of the four measures. Although research on community-based samples of older adults suggests the RAID, STAI, and GAI all have adequate inter-rater and test-retest reliability, the lack of aged care research into these domains means researchers and clinicians must be cautious when these measures are administered multiple times to RACF residents and/or by more than one clinician. Overall, the GAI appeared to be the most reliable measure for use within RACFs populations and the HADS-A and STAI appear to be less reliable, despite being widely used.

Within RACFs, there appeared to be a significant lack of evidence for discriminant, convergent, and factorial validity for all four measures. Specifically, no research was found to examine the validity of the STAI in RACFs, while two studies reported on the GAI and only one study had been conducted on the HADS-A and RAID. Excellent convergent validity was reported for both the GAI and RAID, with the GAI demonstrating the strongest correlation with another measure of anxiety. However, it is important to note that both the GAI and RAID were compared with only one anxiety measure each in the included studies, thereby limiting our ability to confidently establish their validity within this population. Evidence of discriminant validity in RACF residents was found for the HADS-A and GAI only. Again, the GAI had the strongest support for discriminant validity; however, both measures were found to moderately correlate with a measure of depression ($r = >0.40$). While some correlation is expected given the conceptual overlap between anxiety and depression in older adults (Beekman *et al.*, 2000), the ability to distinguish between the two conditions is vital to ensure accurate diagnosis and effective

treatment. Finally, only the HADS' factorial validity had been assessed within RACFs, with the single available study reporting mixed findings regarding the relevance of the original 2-factor model.

Limited research examined the degree to which anxiety measures accurately detected anxiety disorders in RACFs, with only the RAID and GAI being found to have such research conducted within an aged care context. The RAID had strong sensitivity and specificity in detecting GAD, while the GAI appeared to be able to discriminate between those with and without an anxiety disorder. This suggests both measures are likely to be effective in detecting anxiety in RACFs; however, further research is needed as current evidence is based on one to two studies only.

Finally, with regards to administrative and respondent burden, the GAI appeared to out-perform other measures, being the easiest to administer, complete, and score. This is likely due to the GAI being specifically developed for older adults (e.g. through the wording of items and short response sets), thereby enhancing respondent comprehension of items and minimizing fatigue. While the HADS-A and STAI both appeared to have low administrative burden, respondent burden for use with older adults was high due to difficulty comprehending items and response sets. Finally, while specifically developed for older adults, the RAID had high administrative burden due to the long administration time, as well as the requirement for information from both the older adult and a caregiver. Although the inclusion of an informant interview may be appropriate for residents with higher levels of cognitive deficits, the additional administration time is likely to be an additional burden on aged care staff, who are already impacted by rigid routines and time constraints (McCabe *et al.*, 2017).

Limitations

Limitations of this review should be acknowledged. Included studies were limited to peer-reviewed papers published in English. While this may impact on the comprehensiveness of the review, there is no evidence it causes systematic bias (Morrison *et al.*, 2012). In addition, as most included measures had only one to two studies examining their psychometrics in RACFs, the generalizability and reliability of the findings of this review are

likely to be limited.

Conclusions

Overall, this review highlights the lack of consensus among researchers with regards to which anxiety measure is most appropriate for an aged care population and suggests the most commonly used measures of anxiety within RACFs are currently not well validated for this complex and growing subsample of older adults. The GAI appears to be the best validated available measure of anxiety for aged care residents that can be easily administered in the RACF setting, with a cut-off of 9 optimal in detecting clinically significant anxiety. Further research aimed at validating these measures in RACF residents is needed. (Luppa *et al*., 2010).

Conflict of interest

None.

Description of authors' roles

With the assistance of TED and DWK, ASC conducted the systematic review, undertook the interpretation, and wrote the first draft of the manuscript. TED and DWK read and provided comments and suggestions for all further drafts. All authors have contributed to and approved the final manuscript.

Acknowledgments

References

Alexopoulos, G. S., Abrams, R., Young, R. C. and Shamoian, C. A. (1988). Cornell scale for depression in dementia. *Biological Psychiatry*, 23, 271–284. doi: 10.1016/0006-3223(88)90038-8.

Andresen, E. M. (2000). Criteria for assessing the tools of disability outcomes research. *Archives of Physical Medicine and Rehabilitation*, 81(12 Suppl. 2), S15–S20. doi: 10.1053/apmr.2000.20619.

Australian Institute of Health and Welfare (2015). *Residential Aged Care and Home Care 2014–15*. Canberra: Australian Institute of Health and Welfare.

Azcurra, D. J. L. S. (2012). A reminiscence program intervention to improve the quality of life of long-term care residents with Alzheimer's disease. A randomized controlled trial. *Revista Brasileira de Psiquiatria*, 34, 422–433. doi: 10.1016/j.rbp.2012.05.008.

Baldacchino, D. R. and Bonello, L. (2013). Anxiety and depression in care homes in Malta and Australia: part 1. *British Journal of Nursing*, 22, 677–683.

Beekman, A. T. F., De Beurs, E., Van Balkom, A. J. L. M., Deeg, D. J. H., Van Dyck, R. and Van Tilburg, W. (2000). Anxiety and depression in later life: co-occurrence and communality of risk factors. *American Journal of Psychiatry*, 157, 89–95.

Bergua, V. *et al*. (2012). The STAI-Y trait scale: psychometric properties and normative data from a large population-based study of elderly people. *International Psychogeriatrics*, 24, 1163–1171. doi: 10.1017/S1041610212000300.

Bergua, V. *et al*. (2016). Short STAI-Y anxiety scales: validation and normative data for elderly subjects. *Aging and Mental Health*, 20, 987–995. doi: 10.1080/13607863.2015.1051511.

Boddice, G., Pachana, N. A. and Byrne, G. J. (2008). The clinical utility of the geriatric anxiety inventory in older adults with cognitive impairment. *Nursing Older People*, 20, 36–39. doi: https://doi.org/10.7748/nop2008.10.20.8.36.c6809.

Bosmans, J. E. *et al*. (2014). Cost-effectiveness of a stepped care programme to prevent depression and anxiety in residents in homes for the older people: a randomised controlled trial. *International Journal of Geriatric Psychiatry*, 29, 182–190. doi: 10.1002/gps.3987.

Bryant, C., Jackson, H. and Ames, D. (2009). Depression and anxiety in medically unwell older adults: Prevalence and short-term course. *International Psychogeriatrics*, 21, 754–763. doi: 10.1017/S1041610209009399.

Byrne, G. J., Pachana, N. A., Goncalves, D. C., Arnold, E., King, R. and KeatKhoo, S. (2010). Psychometric properties and health correlates of the geriatric anxiety inventory in Australian community-residing older women. *Aging and Mental Health*, 14, 247–254. doi: 10.1080/13607861003587628.

Cooke, M. L., Moyle, W., Shum, D. H. K., Harrison, S. D. and Murfield, J. E. (2010). A randomized controlled trial exploring the effect of music on agitated behaviours and anxiety in older people with dementia. *Aging & Mental Health*, 14, 905–916. doi: 10.1080/13607861003713190.

Creighton, A. S., Davison, T. and Kissane, D. W. (2016). The correlates of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *International Journal of Geriatric Psychiatry*, 32, 141–154.

Creighton, A. S., Davison, T. E. and Kissane, D. W.

A. S. Creighton *et al*.

(2015). The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *International Journal of Geriatric Psychiatry*, 31, 555–566. doi: 10.1002/gps.4378.

Davies, K. N., Burn, W. K., McKenzie, F. R., Brothwell, J. A. and Wattis, J. P. (1993). Evaluation of the hospital anxiety and depression scale as a screening instrument in geriatric medical inpatients. *International Journal of Geriatric Psychiatry*, 8, 165–169. doi: 10.1002/gps.930080209.

Davison, T. E., Eppingstall, B., Runci, S. and O'Connor, D. W. (2016). A pilot trial of acceptance and commitment therapy for symptoms of depression and anxiety in older adults residing in long-term care facilities. *Aging & Mental Health*, 1–8. doi: 10.1080/13607863.2016.1156051.

Dennis, R. E., Boddington, S. J. A. and Funnell, N. J. (2007). Self-report measures of anxiety: Are they suitable for older adults? *Aging and Mental Health*, 11, 668–677. doi: 10.1080/13607860701529916.

Diefenbach, G. J., Tolin, D. F., Meunier, S. A. and Gilliam, C. M. (2009). Assessment of anxiety in older home care recipients. *Gerontologist*, 49, 141–153. doi: 10.1093/geront/gnp019.

Dozeman, E. *et al*. (2012). Contradictory effects for prevention of depression and anxiety in residents in homes for the elderly: a pragmatic randomized controlled trial. *International Psychogeriatrics*, 24, 1242–1251. doi: 10.1017/S1041610212000178.

Drageset, J., Dysvik, E., Espehaug, B., Natvig, G. K. and Furnes, B. (2015). Suffering and mental health among older people living in nursing homes-A mixed-methods study. *Peer J*. doi: 10.7717/peerj.1120.

Drageset, J., Eide, G. E. and Ranhoff, A. H. (2013). Anxiety and depression among nursing home residents without cognitive impairment. *Scandinavian Journal of Caring Sciences*, 27, 872–881. doi: 10.1111/j.1471-6712.2012.01095.x.

Edelstein, B. A., Woodhead, E. L., Segal, D. L., Bower, E. H., Lowery, A. J. and Stoner, S. A. (2007). Older adult psychological assessment. *Clinical Gerontologist*, 31, 1–35.

Gerolimatos, L. A., Gregg, J. J. and Edelstein, B. A. (2013). Assessment of anxiety in long-term care: examination of the geriatric anxiety inventory (GAI) and its short form. *International Psychogeriatrics*, 25, 1533–1542. doi: 10.1017/S1041610213000847.

Gonçalves, D. C., Pachana, N. A. and Byrne, G. J. (2011). Prevalence and correlates of generalized anxiety disorder among older adults in the Australian national survey of mental health and well-being. *Journal of Affective Disorders*, 132, 223–230. doi: http://dx.doi.org/10.1016/j.jad.2011.02.023.

Goyal, A. R., Bergh, S., Engedal, K., Kirkevold, M. and Kirkevold, Ø. (2016). Norwegian version of the rating anxiety in dementia scale (RAID-N): a validity and reliability study. *Aging and Mental Health*, 1–6. doi: 10.1080/13607863.2016.1220921.

Hamilton, M. (1959). The assessment of anxiety states by rating. *British Journal of Medical Psychology*, 32, 50–55.

Hancock, G. A., Woods, B., Challis, D. and Orrell, M. (2006). The needs of older people with dementia in residential care. *International Journal of Geriatric Psychiatry*, 21, 43–49.

Haslam, C., Haslam, S. A., Jetten, J., Bevins, A., Ravenscroft, S. and Tonks, J. (2010). The social treatment: the benefits of group interventions in residential care settings. *Psychology & Aging*, 25, 157–167. doi: 10.1037/a0018256.

Haugan, G. (2015). The FACIT-Sp spiritual well-being scale: an investigation of the dimensionality, reliability and construct validity in a cognitively intact nursing home population. *Scandinavian Journal of Caring Sciences*, 29, 152–164. doi: 10.1111/scs.12123.

Haugan, G. and Drageset, J. (2014). The hospital anxiety and depression scale - dimensionality, reliability and construct validity among cognitively intact nursing home patients. *Journal of Affective Disorders*, 165, 8–15. doi: 10.1016/j.jad.2014.04.042.

Johnco, C., Knight, A., Tadic, D., Wuthrich, V. M., Pachana, N. A. and Oude Voshaar, R. C. (2015). Psychometric properties of the geriatric anxiety inventory (GAI) and its short-form (GAI-SF) in a clinical and non-clinical sample of older adults. *International Psychogeriatrics*, 27, 1089–1097. doi: 10.1017/S1041610214001586.

Kabacoff, R. I., Segal, D. L., Hersen, M. and Van Hasselt, V. B. (1997). Psychometric properties and diagnostic utility of the beck anxiety inventory and the state-trait anxiety inventory with older adult psychiatric outpatients. *Journal of Anxiety Disorders*, 11, 33–47. doi: 10.1016/S0887-6185(96)00033-3.

Keister, K. J. (2006). Predictors of self-assessed health, anxiety, and depressive symptoms in nursing home residents at week 1 postrelocation. *Journal of Aging & Health*, 18, 722–742.

Kogan, J. N., Edelstein, B. A. and McKee, D. R. (2000). Assessment of anxiety in older adults: current status. *Journal of Anxiety Disorders*, 14, 109–132. doi: 10.1016/S0887-6185(99)00044-4.

Kvaal, K., Ulstein, I., Nordhus, I. H. and Engedal, K. (2005). The Spielberger state-trait anxiety inventory (STAI): the state scale in detecting mental disorders in geriatric patients. *International Journal of Geriatric Psychiatry*, 20, 629–634. doi: 10.1002/gps.1330.

Leong, I. Y. and Nuo, T. H. (2007). Prevalence of pain in nursing home residents with different cognitive and communicative abilities. *Clinical Journal of Pain*, 23, 119–127.

Lin, Y. and Taylor, A. G. (1998). Effects of therapeutic touch in reducing pain and anxiety in an

elderly population. *Integrative Medicine*, 1, 155–162.

Lopes, T. S., Afonso, R. M. L. B. M. and Ribeiro, Ó. M. (2016). A quasi-experimental study of a reminiscence program focused on autobiographical memory in institutionalized older adults with cognitive impairment. *Archives of Gerontology and Geriatrics*, 66, 183–192. doi: 10.1016/j.archger.2016.05.007.

Luppa, M., Luck, T., Weyerer, S., König, H., Brähler, E. and Riedel-Heller, S. G. (2010). Prediction of institutionalization in the elderly: a systematic review. *Age and Ageing*, 39, 31–38. doi: 10.1093/ageing/afp202.

McCabe, M. P., Mellor, D., Karantzas, G., Von Treuer, K., Davison, T. and O'Connor, D. W. (2017). Organizational factors related to the confidence of workers in working with residents with dementia or depression in aged care facilities. *Aging & Mental Health*, 21, 487–493. doi: 10.1080/13607863.2015.1118011.

Moher, D., Liberati, A., Tetzlaff, J. and Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*, 6, e1000097. doi: 10.1371/journal.pmed.1000097.

Morrison, A. *et al.* (2012). The effect of English-language restriction on systematic review-based meta-analyses: a systematic review of empirical studies. *International Journal of Technology Assessment in Health Care*, 28, 138–144. doi: 10.1017/s0266462312000086.

Nagatomo, I., Nomaguchi, M. and Takigawa, M. (1995). Anxiety and quality of life in residents of a special nursing home. *International Journal of Geriatric Psychiatry*, 10, 541–545. doi: 10.1002/gps.930100703.

Neville, C. and Teri, L. (2011). Anxiety, anxiety symptoms, and associations among older people with dementia in assisted-living facilities. *International Journal of Mental Health Nursing*, 20, 195–201. doi: 10.1111/j.1447-0349.2010.00724.x.

Pachana, N. A., Byrne, G. J., Siddle, H., Koloski, N., Harley, E. and Arnold, E. (2007). Development and validation of the geriatric anxiety inventory. *International Psychogeriatrics*, 19, 103–114. doi: 10.1017/S1041610206003504.

Potvin, O. *et al.* (2011). Norms and associated factors of the STAI-Y State anxiety inventory in older adults: results from the PAQUID study. *International Psychogeriatrics*, 23, 869–879. doi: 10.1017/S1041610210002358.

Richmond, R. L., Law, J. and Kay-Lambkin, F. (2011). Physical, mental, and cognitive function in a convenience sample of centenarians in Australia. *Journal of the American Geriatrics Society*, 59, 1080–1086. doi: 10.1111/j.1532-5415.2011.03404.x.

Roberts, M. H., Fletcher, R. B. and Merrick, P. L. (2014). The validity and clinical utility of the hospital anxiety and depression scale (HADS) with older adult New Zealanders. *International Psychogeriatrics*, 26, 325–333. doi: 10.1017/S104161021300197X.

Assessment of anxiety in aged care residents

Rozzini, L. *et al.* (2009). Anxiety symptoms in mild cognitive impairment. *International Journal of Geriatric Psychiatry*, 34, 300–305.

Selwood, A., Thorgrimsen, L. and Orrell, M. (2005). Quality of life in dementia – a one-year follow-up study. *International Journal of Geriatric Psychiatry*, 20, 232–237.

Shankar, K. K., Walker, M., Frost, D. and Orrell, M. W. (1999). The development of a valid and reliable scale for rating anxiety in dementia (RAID). *Aging and Mental Health*, 3, 39–49. doi: 10.1080/13607869956424.

Smith, M. *et al.* (2008). Anxiety symptoms among assisted living residents: implications of the "no difference" finding for participants with and without dementia. *Research in Gerontological Nursing*, 1, 97–104. doi: 10.3928/19404921-20080401-06.

Smith, M., Buckwalter, K. C., Kang, H., Ellingrod, V. and Schultz, S. K. (2008). Dementia-specific assisted living: clinical factors and psychotropic medication use. *Journal of the American Psychiatric Nurses Association*, 14, 39–49.

Snow, A. L. *et al.* (2012). Psychometric properties of a structured interview guide for the rating for anxiety in dementia. *Aging and Mental Health*, 16, 592–602. doi: 10.1080/13607863.2011.644518.

Spielberger, C. D., Gorush, R. L., Lushene, R., Vagg, P. R. and Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory STAI (Form Y): Self-Evaluation Questionnaire*. Palo Alto, CA: Consulting Psychologists Press.

Spinhoven, P., Ormel, J., Sloekers, P. P. A., Kempen, G. I. J. M., Speckens, A. E. M. and Van Hemert, A. M. (1997). A validation study of the hospital anxiety and depression scale (HADS) in different groups of dutch subjects. *Psychological Medicine*, 27, 363–370. doi: 10.1017/S0033291796004382.

Stanley, M. A., Beck, J. G. and Zebb, B. J. (1996). Psychometric properties of four anxiety measures in older adults. *Behaviour Research and Therapy*, 34, 827–838. doi: 10.1016/0005-7967(96)00064-2.

Stanley, M. A., Novy, D. M., Bourland, S. L., Beck, J. G. and Averill, P. M. (2001). Assessing older adults with generalized anxiety: a replication and extension. *Behaviour Research and Therapy*, 39, 221–235. doi: 10.1016/S0005-7967(00)00030-9.

Sung, H., Chang, A. M. and Lee, W. (2010). A preferred music listening intervention to reduce anxiety in older adults with dementia in nursing homes. *Journal of Clinical Nursing*, 19, 1056–1064. doi: 10.1111/j.1365-2702.2009.03016.x.

Sung, H., Lee, W. L., Li, T. L. and Watson, R. (2012). A group music intervention using percussion instruments with familiar music to reduce anxiety and agitation of institutionalized older adults with dementia. *International Journal of Geriatric Psychiatry*, 27, 621–627. doi: 10.1002/gps.2761.

Therrien, Z. and Hunsley, J. (2012). Assessment of anxiety in older adults: a systematic review of commonly used measures. *Aging and Mental Health*, 16, 1–16. doi:

A. S. Creighton *et al*.

10.1080/13607863.2011.602960.

Twelftree, H. and Qazi, A. (2006). Relationship between anxiety and agitation in dementia. *Aging and Mental Health*, 10, 362–367. doi: 10.1080/13607860600638511.

Ward, L. C., Wadsworth, A. P. and Peterson, L. P. (1994). Concurrent validity of measures of anxiety, depression, and somatization in elderly, demented, male patients. *Clinical Gerontologist*, 15, 3–13. doi: 10.1300/J018v15n01_02.

Wenborn, J. *et al*. (2013). Providing activity for people with dementia in care homes: a cluster randomised controlled trial. *International Journal of Geriatric Psychiatry*, 28, 1296–1304. doi: 10.1002/gps.3960.

Zigmond, A. and Snaith, R. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica*, 67, 361–370.

Zuidema, S. U., Derksen, E., Verhey, F. R. J. and Koopmans, R. T. C. M. (2007). Prevalence of neuropsychiatric symptoms in a large sample of Dutch nursing home patients with dementia. *International Journal of Geriatric Psychiatry*, 22, 632–638. doi: 10.1002/gps.1722.

3.3. SUMMARY AND CONCLUSION

In this chapter, a review was presented that identified the most commonly used anxiety measures used in research within RACFs, and examined the evidence of their psychometric appropriateness for use within this population. Specifically, the paper focused on the following four measures as they were found to be the most frequently used with aged care residents: the RAID, HADS-A, STAI, and GAI. On the whole, the review highlighted the variability in measures used across aged care research, which suggests a lack of knowledge and consensus regarding the most suitable tool to assess for anxiety within this setting. Another key finding of the review was the overall lack of research into the psychometric properties of anxiety measures within RACF populations. Despite their popularity, the RAID and HADS-A only had one study each investigating their psychometric appropriateness within an aged care setting, the STAI had none, while the GAI had two. The limited research to date reduces the generalizability of findings, thus further studies are needed to replicate and extend the findings of existing research.

Moreover, the review highlighted that there is limited research examining the degree to which anxiety measures accurately detect anxiety disorders in RACFs. The RAID and GAI were the only measures found to have any such research conducted within an aged care context, and this was in only a very small number of studies. The problem of limited research was compounded by the lack of consistent cut-off scores used across studies. With the aged care population rapidly growing, there is a real need for research to determine the sensitivity and specificity of anxiety measures within this context, as well as to identify appropriate cut-off scores. The findings from this review provided the context and rationale for the second empirical paper (*Chapter seven*), which aimed to address these gaps and limitations by examining the psychometric properties and sensitivity and specificity of the RAID, HADS-A, and GAI within a RACF sample.

In the next chapter, a systematic review of the research into the correlates of anxiety among aged care residents is provided. With anxiety found to be so common among the RACF population (as evidenced by the review presented in *Chapter two*), it was considered important to identify and examine those factors associated with anxiety within this population. Not only will this enable us to get a better understanding of the characteristics of this condition within RACFs and the possible reasons for its high prevalence within this setting, it will also help improve the detection and assessment

of residents who experience anxiety or are at risk of developing anxiety, as well as aid in the development of targeted prevention and intervention strategies. Thus, in the next chapter (*Chapter four*), the third and final systematic review is presented, which provides an overview and critical analysis of the current literature examining the factors associated with anxiety among aged care residents.

DECLARATION BY CANDIDATE

In the case of Chapter four, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Study conceptualisation, identification, screening, analysis, and interpretation of relevant literature, and preparation of manuscript.	75

The following co-authors contributed to the work:

Name	Nature of contribution
Dr. Tanya Davison	Provided guidance on the interpretation of literature and write-up, as well as the reading of drafts of the manuscript and provision of feedback and suggestions.
Professor David Kissane	Provided guidance on the interpretation of literature and write-up, as well as the reading of drafts of the manuscript and provision of feedback and suggestions.

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work:

Candidate's Signature	■■■■■■■	Date 15/01/2018

Main Supervisor's Signature	■■■■■■■	Date 15/01/2018

Chapter Four

The Correlates of Anxiety Among Older Adults in Nursing Homes and Other Residential Aged Care Facilities: A Systematic Review

4.1. PREAMBLE TO REVIEW PAPER THREE

This chapter presents the third and final systematic review of the thesis, which aimed to provide an overview and critical analysis of the literature that identifies and examines which factors are associated with anxiety symptoms and disorders within RACFs. Given the reported high prevalence and overall lack of information on how best to assess for anxiety within this growing population, it was considered important to gain a better understanding of the characteristics and factors associated with this condition. It was hoped that in doing so, our ability to detect residents who were either experiencing or at-risk of anxiety would be enhanced, as well as enable the development of targeted prevention and intervention strategies. This chapter also provides an introduction and rationale for the third empirical paper of this thesis presented in *Chapter eight*, which examines the correlates associated with anxiety symptoms among elderly RACF residents.

This review has been published in the *International Journal of Geriatric Psychiatry*, a peer-reviewed journal with an impact factor of 3.018 (ISI Web of Knowledge, 2017). In accordance with Monash University's guidelines for a thesis including published works, the manuscript has been presented in the original publication format of the journal. However, the Tables and Figures within the manuscript have been renumbered to generate a consistent presentation and order within the thesis. This paper has been reprinted with permission from John Wiley & Sons, Ltd (see Appendix B).

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2016). The correlates of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *International Journal of Geriatric Psychiatry, 32*(2), 141-154.

REVIEW ARTICLE

The correlates of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review

Alexandra S. Creighton[1,2], Tanya E. Davison[2] and David W. Kissane[2]

[1]School of Psychological Sciences, Monash University, Clayton, Victoria, Australia
[2]Department of Psychiatry, Monash University, Clayton, Victoria, Australia
Correspondence to: Professor D. W, Kissane, Level 3, P Block, Monash Medical Centre, 246 Clayton Road, Clayton, Victoria, 3168, Australia.
E-mail: David.Kissane@monash.edu

Objective: To synthesize and summarize the studies examining the correlates and predictors of anxiety in older adults living in residential aged care.

Methods: Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, five electronic databases were searched using key terms and subject headings, as well as reference lists of relevant papers. The search was limited to peer-reviewed literature published in English. Eligible studies examined the association between at least one correlate/factor and anxiety disorders or symptoms in aged care residents aged 50+ years.

Results: A total of 3741 articles were identified, of which 34 studies (with a total of 1 543 554 participants) were included in this review. Correlates associated with anxiety included pain, use of anti-depressants/lithium, depression, and lower perceived quality of life. Less consistent and/or less studied variables included younger age, female gender, higher educational level, functional dependence, subjective health status, more prescribed medications, impaired vision, insomnia, external locus of control, fear of falling, attachment, hope, meaning in life, and the influence of social, environmental, and staff/policy correlates.

Conclusions: While several variables were found to have strong associations with anxiety in aged care residents, a number of factors have been examined by only one or two studies. Further research (preferably prospective studies) is therefore needed to reliably confirm findings and to help plan and develop preventative and intervention strategies. Copyright © 2016 John Wiley & Sons, Ltd.

Introduction

Anxiety has been found to be one of the most common psychiatric conditions in later life (Gonçalves, Pachana, & Byrne, 2011). However, research into anxiety among residents of residential aged care facilities (RACFs; also known as nursing

homes, hostels, assisted-living facilities, and long-term care/residential homes) has only recently gained momentum.

To date, the rate of anxiety disorders and symptoms within this population is reported to range from 3.2% to 20% and 6.5% to 58.4%, respectively (Creighton, Davison, & Kissane, 2015). This suggests that, compared to community-dwelling elderly (where prevalence rates for anxiety disorders range from 0.7% to 17%) (Copeland et al., 1987; Kirmizioglu, Doan, Kuu, & Akyüz, 2009), anxiety is more prevalent in aged care residents. With people now living longer than previous generations, often with chronic health conditions, it is likely that this problem will worsen over coming years.

In an attempt to improve the detection of elderly people who experience anxiety or are at risk of developing anxiety, researchers have begun to investigate potential risk factors and correlates of late-life anxiety. Reviews on the factors associated with anxiety within a community-based population suggest variables such as cognitive impairment, high blood pressure, poor self-perceived health, functional limitations, female gender, and external locus of control are associated with an increased risk of anxiety (Vink, Aartsen, & Schoevers, 2008; Wolitzky-Taylor, Castriotta, Lenze, Stanley, & Craske, 2010). As well as adding to our understanding of the condition, this research provides some indications of how we might prevent anxiety disorders from developing or intervene to reduce the burden of anxiety in older adults.

However, to date no systematic review has been conducted specifically examining research on the correlates and predictors of anxiety within the rapidly growing aged care population. As older adults within RACFs are substantially older and more cognitively and functionally impaired than the community-dwelling elderly (Australian Institute of Health and Welfare, 2012), generalizing findings from community-based studies is problematic, and thus an overview of research conducted within RACFs is required. Given that reviews provide the field with

an overview of the current state of knowledge in an integrative and critical manner, this systematic review aims to address this gap by describing and evaluating current research into the correlates of anxiety disorders and symptoms among older aged care residents. Not only will this enable an examination of key conceptual and methodological issues and provide potential directions for future research, it is hoped this review will also provide an understanding of which factors have been consistently found to be associated with anxiety. This knowledge is important and has significant implications for the development of appropriate and targeted prevention and intervention strategies for the growing RACF population.

Methods

Identification of relevant literature

The review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher, Liberati, Tetzlaff, & Altman, 2009). Five databases (Scopus, Ovid MEDLINE, PsycINFO, CINAHL, and Cochrane) were searched on 17 November 2015 using the search terms and limiters outlined in Figure 4.1. Reference lists of included articles were also manually screened to identify papers that had not yet been included.

Eligibility criteria

To the authors' knowledge, no previous review has been conducted on the literature examining the correlates of anxiety in RACFs. Thus, all studies published from inception to October 2015 were considered, if they met the following inclusion criteria:
(1) Reported cross-sectional or longitudinal quantitative data examining the association between anxiety and at least one factor. Studies that used anxiety as either a dependent or independent variable were

---

Databases: Scopus, Ovid MEDLINE, PsycINFO, CINAHL, Cochrane.

Search:

(correlate* OR factor* OR associat* OR predictor*)

AND

(anxiety OR anxiety disorders OR anxiety symptoms OR subthreshold anxiety OR subsyndromal anxiety OR specific OR simple phobia OR generali* anxiety disorder OR agoraphobia OR panic disorder OR social phobia OR social anxiety disorder)

AND

(nursing home* OR aged care OR assisted living OR residential care)

Limiters: English, Peer-reviewed

Figure 4.1 Search terms and strategy

included;
(2) Included data on RACF residents aged 50 years or older; and
(3) Published in English, in a peer-reviewed journal.

The primary outcome measure was the reported association between anxiety and the factor(s)/correlate(s) studied in the RACF population. Case reports, qualitative studies, reviews, theses, dissertations, and conference abstracts were excluded as they were considered to be outside the scope of this review.

Study selection and data extraction

Using the systematic review software Covidence, all references returned by the electronic searches were examined for duplicates and screened by title and abstract. The full text for potential studies was then sourced and examined to determine eligibility for inclusion.

For each included study, information was collected on: the country where the study was conducted, year of publication, study design, sample size, age range/mean age of participants, method/measure used to assess anxiety, the correlate(s) studied, statistical analyses used, whether statistical significance was found, and the direction of association.

Categorization of variables and coding associations with anxiety

Because of the limited amount of published literature in this area, all variables identified were included in the review. These were organized using the following categories: (i) demographic; (ii) medical/biological; (iii) psychological/cognitive/emotional; (iv) social/cultural factors; and (v) physical environment/staff/ policy factors.

Tables 4.2–4.6 provide an overview of the findings from the included studies, with the direction of association being indicated by a "+" for a positive association with anxiety, and "-" for a negative association. Strength of evidence has been denoted by the number of +/- (see footnotes for Tables 4.2–4.6).

A variety of univariate and multivariate statistical analyses were used to evaluate correlates, with the most common being regression, correlations, t-test, and chi-

square. If both uni-/bivariate and multivariate tests were conducted, uni-/biviariate tests were reported for consistency across studies.

Appraisal of methodological quality

Methodological quality was appraised using the Standard Quality Assessment Criteria for Evaluating Primary Research Papers (Kmet, Lee, & Cook, 2004). This checklist comprises 11 criteria assessing: appropriateness of study design, clarity with which participant selection and characteristics are described, adequacy of sample size, appropriateness of analytic methods, and whether the conclusions were supported by the data. Each criterion is given a score from 0 to 2, with 2 given for fully meeting the criterion, 1 for partially meeting the criterion, and 0 for not meeting criterion. A summary score ranging from 0 to 1 was calculated, with higher scores indicating a higher level of methodological quality. Studies with samples sizes ≤50 were excluded from this review, because of concerns about the lack of power needed to run the correlational analyses they conducted.

Results

The search returned 4478 articles (see Figure 4.2). After the removal of duplicates and addition of six other papers identified through other sources, 3741 studies remained. These were then screened by title and abstract, after which 97 articles remained. The full texts of these studies were then assessed for eligibility, with 34 studies included in this review. Figure 4.2 outlines the process of study selection and reasons for exclusion. Collectively, these studies examined 54 variables and their association with anxiety in RACF residents.

Participant and study characteristics

Sample sizes ranged from 51 (Van Almenkerk, Depla, Smalbrugge, Eefsting, & Hertogh, 2015) to 1 492 200 (Walid & Zaytseva, 2009), with a total of 1 543 554 participants across all studies (median = 238 participants). An overlap in participants was present across two studies by Drageset and colleagues (Drageset, Eide, & Ranhoff, 2013a, 2013b); two by Haugan (Haugan, 2014; Haugan, Innstrand, & Moksnes, 2013); and four studies by Smalbrugge and colleagues (Smalbrugge et al. (2005a); Smalbrugge, Jongenelis, Pot, Beekman, & Eefsting, 2007; Smalbrugge et al., 2005b; Smalbrugge et al., 2006). Only one of each of these studies contributed to the number of subjects; however, given that each study examined different correlates, all were included in the review.

An additional Fisher's exact test examining differences in proportions of significant associations between studies with small ($n < 220$) or large sample sizes ($n \geq 220$) found no statistically significant association ($p = 0.427$).

Table 4.1 presents the characteristics of all studies included in this review, including participant characteristics, study design and quality rating, anxiety assessment measures, and performed statistical analyses. Thirty studies (83%) utilized a cross-sectional design, while four (12%) were prospective/longitudinal. Eleven studies (31%) were a secondary analysis of data collected for a previous study. Sixty-two percent ($n = 21$) of included studies attempted to control for potential confounders of anxiety, with the majority using regression analyses (e.g. multiple linear regression, logistic regression) to do so. Studies controlled for factors such as depression, Schizophrenia, Parkinson's disease, behavioural symptoms, and demographic factors, which were considered appropriate given the predictor/correlate of anxiety being studied. The review yielded studies from 13 countries, with the largest number of studies from the United States of America ($n = 14$), followed by the Netherlands ($n =$

Correlates of anxiety in residential care
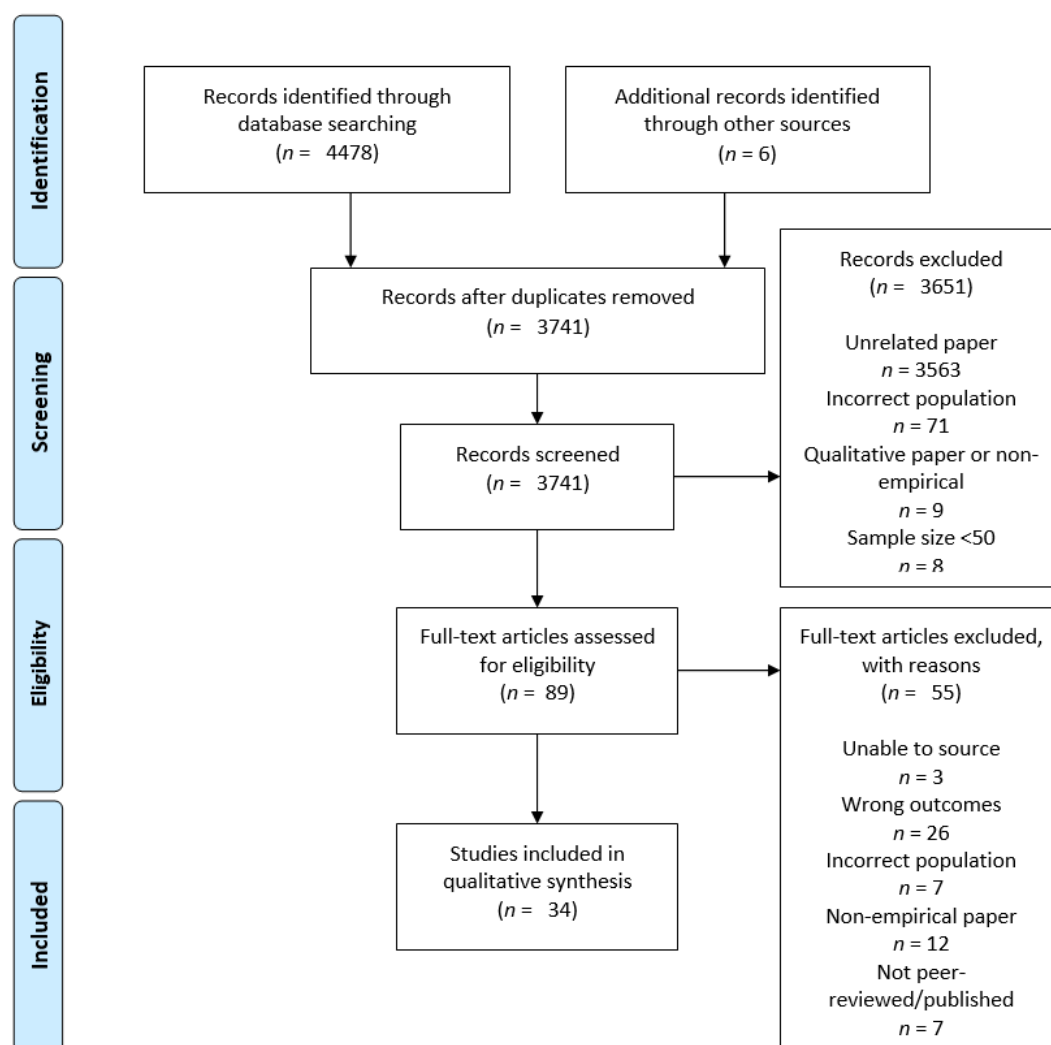
Figure 4.2 Flowchart depicting study selection

7), Norway ($n = 4$), United Kingdom ($n = 2$) Australia ($n = 2$), and Malta, Italy, Spain, Japan, France, Egypt, and Canada (all had an $n = 1$).

Correlates of anxiety in RACF residents

Tables 4.2 to 4.6 summarize the associations between potential correlates and anxiety in RACF residents.

Demographic correlates. Five demographic variables were examined (age, educational status, gender, marital status, and whether or not the resident had children), with younger age, a higher educational level, and female gender found to be significantly related to higher anxiety (Table 4.2).

Biological/health-related correlates. Out of 18 variables examined, 14 were found to be significantly associated with anxiety. Specifically, use of anticholinergic medications, antipsychotic medications, and antidepressants, higher cognitive functioning, a higher number of medications, an increased risk of falls,

Table 4.1   Study Characteristics

Author(s) (year)	Participants	Design (location of sample)	Measure of anxiety (administration method)	Statistical test(s)	Quality rating
Baldacchino and Bonello (2013)	137 Maltese older adults from six RACFs; aged ≥65 years	Cross-sectional, comparative study; purposive convenience sampling used to recruit RACFs (Malta and Australia)	HADS-A (SR)	Student t-test; one-way ANOVA	0.85
Carstensen and Fremouw (1988)	51 older adults from one rural RACF; aged ≥55 years	Cross-sectional, observational study (USA)	SADS (SR)	Correlation coefficients	0.75
Casten, Parmelee, Kleban, Powell Lawton, and Katz (1995)	579 older adults from one RACF; aged ≥61 years	Cross-sectional study; secondary analysis of data obtained from a larger, ongoing study (USA)	DSM-III-R Symptom Checklist (SI); POMS (SR)	Hierarchical multiple regression; SEM	0.91
Chatterjee, Mehta, Sherer, and Aparasu (2010)	13 507 older adults with dementia from 1174 RACFs; aged ≥65 years	Cross-sectional, nationally representative sample of RACF residents with dementia; utilized data from the 2004 National Nursing Home Survey (USA)	MDS (CR)	Multivariate logistic regression	0.95
Cheok, Snowdon, Miller, and Vaughan (1996)	107 older adults from five RACFs; aged ≥65 years	Cross-sectional study; convenience sampling used to recruit residents (Australia)	GA scale (SR)	t-test; chi-square test	0.75
Drageset et al. (2013a)	227 older adults without cognitive impairment from 30 RACFs; ≥65 years	Cross-sectional, observational study; convenience sample of RACFs (Norway)	HADS-A (SR)	Chi-square test; ordinal logistic regression	0.90
Drageset et al. (2013b)	227 older adults without cognitive impairment from 30 RACFs; ≥65 years	Prospective, observational study (Norway)	HADS-A (SR)	Cox proportional hazards regression model	0.95
Hancock, Woods, Challis, and Orell (2006)	238 older adults with dementia from 24 RACFs; aged ≥60 years	Cross-sectional, observational study (United Kingdom)	RAID (SSI)	t-test	0.85
Haugan et al. (2013)	202 cognitively intact older adults from 44 RACFs; aged ≥65 years	Cross-sectional, observational study (Norway)	HADS-A (SR)	SEM	0.95
Haugan (2014)	202 cognitively intact older adults from 44 RACFs; aged ≥65 years	Cross-sectional, observational study; random sampling of RACFs (Norway)	HADS-A (SR)	Correlational analyses	0.95
Hoe et al. (2006)	238 older adults with dementia from 24 RACFs; aged ≥60 years	Cross-sectional, observational study; secondary analysis of data obtained from larger study (United Kingdom)	RAID (SSI)	Correlational analyses; multivariate regression	0.75
Junginger, Phelan, Cherry, and Levy (1993)	100 older adults from one RACF; aged ≥65 years	Cross-sectional, random sample of residents (USA)	SCID for DSM-III-R (SI)	Chi-square	0.75

(Continues)

pain, functional impairment, more medical diagnoses, impaired vision, insomnia, experience of a stroke, more medical specialist consultations, and having worse self-perceived health were found to be associated with higher anxiety. No association was found with use of anxiolytics or tranquilizers, the presence of chronic obstructive pulmonary disease, or impaired hearing (Table 4.3).

Psychological/emotional correlates. Out of 11 variables examined, 10 were found to be associated with anxiety. Depression, a lower perceived quality of life, external locus of control, more frequent behavioural problems, the experience of a negative life event, and fear of falling were all found to

Correlates of anxiety in residential care

Table 4.1   (Continued)

Author(s) (year)	Participants	Design (location of sample)	Measure of anxiety (administration method)	Statistical test(s)	Quality rating
Kamble, Chen, Sherer, and Aparasu (2009)	6103 older adults with dementia; aged ≥65 years	Cross-sectional, nationally representative study of RACFs and residents with dementia; stratified, two-stage probability study design; utilized data from the 2004 National Nursing Home Survey (USA)	MDS (CR)	Multiple logistic regression	0.95
Karkare, Bhattacharjee, Kamble, and Aparasu (2011)	13 507 older adults from 1174 RACFs; aged ≥65 years	Cross-sectional, nationally representative study of RACFs and residents; stratified, two-stage probability study design; utilized data from the 2004 National Nursing Home Survey (USA)	MDS (CR)	Multiple logistic regression	0.90
Keister (2006)	114 older adults from 11 RACFs; aged ≥65 years	Prospective study; convenience sampling of residents used; data from Time 1 used only (USA)	STAI (SR)	Hierarchical regression	0.80
Landi et al. (2015)	1490 older adults from 31 RACFs; aged ≥65 years	Prospective, observational study; secondary analysis of data from a larger, prospective cohort study (Italy)	MDS (CR)	Chi-square test; ANOVA	0.95
Lapane, Quilliam, Chow, and Kim (2012)	9952 older adults from 185 RACFs	Cross-sectional study; random sampling of residents used (USA)	MDS (CR)	Multiple logistic regression	0.95
Milliren (1977)	131 residents from one RACF	Cross-sectional study; secondary analysis of data (USA)	Mental Status Quotient (SI)	Chi-square test	0.75
Moreno et al. (2008-2009)	105 older adults from one RACF; aged ≥65 years	Cross-sectional study (Spain)	Spanish version of Templer Death Anxiety Scale (SR)	ANOVA	0.85
Mullins and Lopez (1982)	228 older adults from three RACFs; mean age = 75.18 years	Cross-sectional, comparative study of older (≥75 years) and younger (≤74 years) residents (USA)	Templer Death Anxiety Scale (SR)	Discriminant analysis	0.75
Neville and Teri (2011)	148 older adults from 19 RACFs; aged ≥69 years	Cross-sectional study; retrospective, secondary analysis of data (USA)	RAID (SSI)	Regression analysis	0.90
Nijk, Zuidema, and Koopmans (2009)	1322 older adults with dementia from 25 RACFs; aged 37–102 years	Cross-sectional (Netherlands)	NPI-NH (OS)	Logistic regression	0.95
Parmelee, Katz, and Lawton (1993)	994 older adults from one RACF and one independent living apartment; aged 61–102 years	Prospective study (USA)	Checklist of symptoms based on the SADS for DSM-III-R	Chi-square test; ANOVA	0.65
Prado-Jean et al. (2010)	319 older adults with dementia from 17 RACFs; aged ≥65 years	Cross-sectional study; random sample of RACFs (France)	NPI-NH (OS)	Student t-test; chi-square test	0.80
Sharaf and Ibrahim (2008)	208 older adults from all government and two private RACFs; aged ≥60 years	Cross-sectional study (Egypt)	STAI (SR)	t-test; ANOVA; Pearson correlation; stepwise multiple regression	0.90

(Continues)

be significantly and positively related to higher anxiety. Higher intra-personal self-transcendence, hope, more meaning in life, and higher wellbeing were all found to have a significant negative association with anxiety. No association was found with stress or interpersonal self-transcendence (Table 4.4).

Social/cultural correlates. Out of eight variables examined, only lower perceived social support and social competence, and attachment were found to be significantly associated with higher anxiety. Loneliness, receiving reassurance of worth from others, opportunity for nurturance, religiousness, and social integration had no association with anxiety (Table 4.5).

Table 4.1   (Continued)

Author(s) (year)	Participants	Design (location of sample)	Measure of anxiety (administration method)	Statistical test(s)	Quality rating
Smalbrugge et al. (2005a); Smalbrugge et al. (2005b); Smalbrugge et al. (2007)	333 older adults from 14 RACFs; aged ≥55 years	Cross-sectional, observational study; secondary analysis of data obtained for AGED study (Netherlands)	SCAN (SSI)	Logistic regression	0.95
Smalbrugge et al. (2006)	333 older adults from 14 RACFs; aged ≥55 years	Cross-sectional, observational study; secondary analysis of data obtained for AGED study (Netherlands)	SCAN (SSI)	Multilevel regression; ANOVA; chi-square test	0.95
Thomasma, Yeaworth, and McCabe (1990)	62 older adults from one RACF; aged ≥70 years	Quasi-experimental, time-series design (USA)	STAI (SR)	Pearson correlations; ANOVA	0.85
Van Almenkerk et al. (2015)	274 older adults who had had a stroke from 17 RACFs	Cross-sectional, observational study (Netherlands)	NPI (OS)	Multilevel analyses	0.95
Voyer, Verreault, Mengue, and Morin (2006)	2332 older adults from 28 RACFs; aged ≥65 years	Cross-sectional, observational study; secondary analysis of data (Canada)	Seven MOSES items (OS)	Logistic regression	0.85
Walid and Zaytseva (2009)	1 492 200 older adults from 1174 RACFs; aged ≥65 years	Cross-sectional, nationally representative study of RACFs and residents; stratified, two-stage probability study design; data from 2004 National Nursing Home Survey (USA)	Diagnosis of anxiety on file	Correlational analyses	0.60
Zuidema, De Jonghe, Verhey, and Koopmans (2009)	1319 older adults from 26 RACFs; median age = 83 years	Cross-sectional, cohort study (Netherlands)	NPI-NH (OS)	Logistic regression	0.95

RACFs, residential aged care facilities; HADS-A, Hospital Anxiety and Depression Scale—Anxiety Subscale; SR, self-report; ANOVA, Analysis of Variance; SADS, Social Avoidance and Distress Scale; DSM-III-R, Diagnostic and Statistical Manual—third edition—revised; SI, structured inter-view; POMS, Profile of Mood States; MDS, Minimum Data Set; SEM, structural equation modelling; CR, caregiver report; GA Scale, Generalized Anxiety Scale; HADS-A, Hospital Anxiety and Depression Scale—Anxiety Subscale; RAID, Rating Anxiety in Dementia Scale; SSI, semi-structured interview; SCID, Structured Clinical Interview for DSM-III-R; HARS, Hamilton Anxiety Rating Scale; STAI, State-Trait Anxiety Inventory; MMSE, mini-mental state examination; NPI-NH, Neuropsychiatric Inventory—Nursing Home version; SADS, Schizophrenia and Affective Dis-orders Schedule; MMPI, Minnesota Multiphasic Personality Inventory; AGED study, Amsterdam Groningen Elderly Depression study; SCAN, Schedules for Clinical Assessment in Neuropsychiatry; MANOVA, multivariate analysis of variance; NPI, Neuropsychiatric Inventory; MOSES, Multidimensional Observation Scale for Elderly Subjects; OS, observational scale; GAS, Goldberg Anxiety Scale.

Physical environment/staff/policy correlates. Five out of eleven variables studied were found to be significantly associated with anxiety. Relocating to dependent living compared to an independent living facility, residing at an RACF for longer, receiving a more negative reaction to behavioural issues from staff, and the presence of more unmet needs were all found to be significantly and positively associated with anxiety. Residents' perceived nurse-patient interactions were indirectly associated with with anxiety, mediated by the influence of depression. No effects were reported for perceived inadequacy of care, the resident's level of decisional control in the move to the RACF, and staff's sense of competence, qualifications, age, and job satisfaction

(Table 4.6).

Predictors of anxiety in RACF residents

One study examined the predictors of anxiety among RACF residents. Keister (2006) found residents with an internal locus of control and who appraised the relocation to an RACF as challenging were less likely to experience anxiety post-one week relocation, while receiving more information (obtaining informational support) was a significant predictor of higher anxiety.

Discussion

To the authors' knowledge, this review is the first to document the literature examining the correlates and predictors of

Correlates of anxiety in residential care

Table 4.2 Summary of associations between demographic correlates and anxiety in RACF residents

Variable	Studies	Strength of evidence[a]	% of studies reporting association	Comment
Age (younger)	Baldacchino and Bonello (2013); Cheok et al. (1996); Drageset et al. (2013a); Moreno et al. (2008–2009); Mullins and Lopez (1982); Neville and Teri (2011); Parmelee et al. (1993); Smalbrugge et al. (2005a); Smalbrugge et al. (2005b); Thomasma et al. (1990)	++	4/10 (40%)	Younger age was found to be significantly associated with anxiety.
Educational status	Baldacchino and Bonello (2013); Drageset et al. (2013b); Junginger et al. (1993); Moreno et al. (2008–2009); Mullins and Lopez (1982);Smalbrugge et al. (2005a); Smalbrugge et al. (2005b)	++	3/7 (43%)	Higher educational level was found to have a significant
Gender (female)	Baldacchino and Bonello (2013); Cheok et al. (1996); Drageset et al. (2013b); Milliren (1977);Moreno et al. (2008-2009); Mullins and Lopez (1982);Neville and Teri (2011); Parmelee et al. (1993); Smalbrugge et al. (2005a); Smalbrugge et al. (2005b) Zuidema et al. (2009)	+	2/11 (18%)	positive association with anxiety.
Marital status	Baldacchino and Bonello (2013); Drageset et al. (2013b); Junginger et al. (1993); Smalbrugge et al. (2005a); Smalbrugge et al. (2005b)	0	0/5 (0%)	
Children (yes/no)	Smalbrugge et al. (2005a); Smalbrugge et al. (2005b)	0	0/2 (0%)	

[a]= strength of evidence determined using the following: + = positive association from at least one cross-sectional study; ++ = positive association from at least three cross-sectional studies; +++ = positive association from five or more cross-sectional studies; ++++ = positive association from at least one prospective study; - = negative association from at least one cross-sectional study; - - = negative association from at least three cross-sectional studies; - - - = negative association from five or more cross-sectional studies; - - - - = negative association from one prospective study; 0 = no association found.

Table 4.3 Summary of associations between biological/health-related correlates and anxiety in RACF residents

Variable	Studies	Strength of evidence[a]	% of studies reporting association	Comment
Use of anticholinergic medication	Chatterjee et al. (2010); Landi et al. (2015)	++++	2/2 (100%)	
Pain	Casten et al. (1995); Lapane et al. (2012); Smalbrugge, Jongenelis, et al. (2005a); Smalbrugge et al. (2007); Smalbrugge et al. (2005a); Van Almenkerk et al. (2015);Walid and Zaytseva (2009)	+++	6/7 (86%)	
Cognitive functioning (higher)	Cheok et al. (1996); Neville and Teri (2011); Parmelee et al. (1993);Smalbrugge et al. (2005a);Smalbrugge, Pot, et al. (2005); Zuidema et al. (2009)	++	3/6 (503%)	
Functional dependence/ impairment	Keister (2006); Mullins and Lopez (1982);Parmelee et al. (1993); Smalbrugge et al. (2005a); Smalbrugge et al. (2005b); Smalbrugge et al. (2006)	++	3/6 (50%)	
Use of antipsychotic medication	Kamble et al. (2009); Nijk et al. (2009)	+	1/2 (50%)	

(Continues)

Int J Geriatr Psychiatry 2016

Table 4.3 (Continued)

Variable	Studies	Strength of evidence[a]	% of studies reporting association	Comment
Stroke	Smalbrugge, Jongenelis, *et al.* (2005); Smalbrugge, Pot, *et al.* (2005)	+	1/2 (50%)	Experiencing a stroke was found to be significantly associated with higher anxiety symptoms but not subthreshold anxiety disorders.
Medical specialist consultations	Smalbrugge *et al.* (2006)	+	1/1 (100%)	
Number of medical diagnoses	Drageset *et al.* (2013b); Moreno *et al.* (2008–2009); Parmelee *et al.* (1993); Smalbrugge, Jongenelis, *et al.* (2005a); Smalbrugge, Pot, *et al.* (2005b)	+	2/5 (40%)	
Subjective health status	Moreno *et al.* (2008-2009); Mullins and Lopez (1982)	-	2/2 (100%)	Both studies found subjective health status to be significantly poorer in residents with higher levels of death anxiety.
Number of medications	Smalbrugge *et al.* (2006)	+	1/1 (100%)	
Use of antidepressants or lithium	Cheok *et al.* (1996); Karkare *et al.* (2011); Nijk *et al.* (2009); Smalbrugge *et al.* (2006)	+/-	3/4 (75%)	One study (Karkare et al., 2011) reported that residents were significantly less likely to receive antidepressants with a diagnosis of anxiety. The remaining two studies found anxiety to be positively associated with antidepressant use.
Impaired vision	Smalbrugge, Jongenelis, *et al.* (2005a); Smalbrugge, Pot, *et al.* (2005b)	+	1/2 (50%)	Impaired vision was found to be significantly associated with higher anxiety symptoms but not subthreshold anxiety disorders.
Insomnia	Voyer *et al.* (2006)	+	1/1 (100%)	
Use of anxiolytics	Nijk et al. (2009); Smalbrugge *et al.* (2006)	0	0/2 (0%)	
Use of tranquilizers	Milliren (1977); Nijk *et al.* (2009)	0	0/2 (0%)	
COPD	Smalbrugge, Jongenelis, *et al.* (2005a); Smalbrugge, Pot, *et al.* (2005b)	0	0/2 (0%)	
Impaired hearing	Smalbrugge, Jongenelis, *et al.* (2005a); Smalbrugge, Pot, *et al.* (2005b)	0	0/2 (0%)	

COPD, chronic obstructive pulmonary disease.
[a]= strength of evidence determined using the following: + = positive association from at least one cross-sectional study; ++ = positive association from at least three cross-sectional studies;+++ = positive association from five or more cross-sectional studies; ++++ = positive association from at least one prospective study; - = negative association from at least one cross-sectional study; - - = negative association from at least three cross-sectional studies; - - - = negative association from five or more cross-sectional studies; - - - - = negative association from one prospective study; 0 = no association found.

anxiety in RACF residents. Significant correlates were found in all five categories, with the strongest and most consistent associations (i.e. ≥70% of three or more studies) with anxiety being found for: depression, lower perceived quality of life, pain, use of anti-depressants or lithium, and lower perceived social support. As two thirds of studies included in the review attempted to control for potential confounders, these offer some reassurance, but we note that another third failed to

Correlates of anxiety in residential care

Table 4.4 Summary of associations between psychological/emotional correlates and anxiety in RACF residents

Variable	Studies	Strength of evidence[a]	% of studies reporting association	Comment
Depression	Cheok *et al.* (1996); Haugan *et al.*(2013); Moreno *et al.* (2008-2009); Neville and Teri (2011); Parmelee *et al.*(1993); Prado-Jean *et al.* (2010); Smalbrugge, Pot, *et al.* (2005b)	++++	7/7 (100%)	
Perceived quality of life (higher)	Almeida *et al.* (2012); Hoe *et al.* (2006);	- - - -	2/3 (670%)	
External locus of control	Keister (2006)	++++	1/1 (100%)	
Fear of falling	Sharaf and Ibrahim (2008)	+	1/1 (100%)	Fear of falling significantly and positively correlated with trait and state anxiety.
Frequency of behavioural problems	Neville and Teri (2011)	+	1/1 (100%)	
Life events	Moreno *et al.* (2008-2009); Smalbrugge, Jongenelis, *et al.* (2005a); Smalbrugge, Pot, *et al.* (2005b)	+	2/4 (50%)	Experience of a significant life even in the past year was significantly associated with higher anxiety.
Intrapersonal self-transcendence (higher)	Haugan (2014)	-	1/1 (100%)	
Hope	Haugan (2014)	-	1/1 (100%)	
Meaning in life (increased purposefulness)	Haugan (2014)	-	1/1 (100%)	
Cognitive appraisal of situation	Keister (2006)	-	1/1 (100%)	The more challenging the older adult appraised relocation to a RACF, the less anxiety they experienced.
Wellbeing (higher)	Smalbrugge *et al.* (2006)	-	1/1 (100%)	
Interpersonal self-transcendence (higher)	Haugan (2014)	0	0/1 (0%)	

RACF, Residential aged care facility.
[a]= strength of evidence determined using the following: + = positive association from at least one cross-sectional study; ++ = positive association from at least three cross-sectional studies;+++ = positive association from five or more cross-sectional studies; ++++ = positive association from at least one prospective study; - = negative association from at least one cross-sectional study; - - = negative association from at least three cross-sectional studies; - - - = negative association from five or more cross-sectional studies; - - - - = negative association from one prospective study; 0 = no association found.

control for any confounders and consequential variables may have been missed. There is a need for more studies to continue examining this.

With regards to demographic factors, the present review suggests that younger age, female gender, and higher educational level may be correlated with higher levels of anxiety. However, fewer than 50% of studies examining these factors found a significant relationship, suggesting that the strength of association is questionable. Nonetheless, these findings are similar to those found in community-dwelling older adults, where female gender (Vink et al., 2008) and younger age (i.e., those aged 65-74 years) (Byers et al., 2010; Gonçalves et al., 2011; Grenier et al., 2011; Gum et al., 2009) have been found to be associated with a higher prevalence of anxiety disor-

Table 4.5 Summary of associations between social/cultural correlates and anxiety in RACF residents

Variable	Studies	Strength of evidence[a]	% of studies reporting association	Comment
Social support (subjective)	Keister (2006); Mullins and Lopez (1982); Smalbrugge, Jongenelis, *et al.* (2005a); Smalbrugge, Pot, *et al.* (2005b)	- -	3/4 (75%)	
Social competence	Carstensen and Fremouw (1988)	-	1/1 (100%)	Lower objectively rated social competence was significantly associated with higher anxiety.
Attachment	Drageset *et al.* (2013a)	-	1/1 (100%)	
Loneliness	Smalbrugge, Jongenelis, *et al.* (2005a);Smalbrugge, Pot, *et al.* (2005b)	0	0/2 (0%)	
Reassurance of worth from others	Drageset *et al.* (2013a)	0	0/1 (0%)	
Opportunity for nurturance (i.e. being responsible for the care of others)	Drageset *et al.* (2013a)	0	0/1 (0%)	
Religiousness	Moreno *et al.* (2008-2009)	0	0/1 (0%)	
Social integration	Drageset *et al.* (2013b)	0	0/1 (0%)	

RACF, Residential aged care facility.
[a]= strength of evidence determined using the following: + = positive association from at least one cross-sectional study; ++ = positive association from at least three cross-sectional studies; +++ = positive association from five or more cross-sectional studies; ++++ = positive association from at least one prospective study; = negative association from at least one cross-sectional study; = negative association from at least three cross-sectional studies; = negative association from five or more cross-sectional studies; = negative association from one prospective study; 0 = no association found.

ders and symptoms. Given that knowledge on demographic correlates of anxiety in RACF residents has the potential to help staff identify individuals who may be at risk, further research assessing these factors would be beneficial.

The most consistent biological/health-related correlates were pain, use of anti-depressants/lithium, and functional dependence, with 86%, 75%, and 50% of studies finding a significant positive association, respectively. Cognitive functioning was the least consistent variable, with three of six studies finding that higher cognitive functioning was associated with increased anxiety. While use of anticholinergic medications, risk of falls, higher mortality in residents with cancer, medical specialist consultations, poorer subjective health status, more prescribed medications, impaired vision, and insomnia were also all found to be positively associated with anxiety, information on these factors was limited to one or two studies. These findings are in contrast to those within community-dwelling elderly samples, where poorer self-perceived health (Almeida et al., 2012; Gonçalves et al., 2011; Ribeiro et al., 2015), number of chronic illnesses (Forlani et al., 2014; Gonçalves et al., 2011; Grenier et al., 2011), and cognitive impairment appear to be the three most common biological variables positively associated with anxiety. Given that the number of frail RACF residents experiencing comorbid medical issues is increasing (Dwyer, Stoelwinder, Gabbe, & Lowthian, 2015), and research has found a strong association between depression and both perceived and number of health problems, (Braam et al., 2005; Davison, McCabe, Knight, & Mellor, 2012), further research to confirm and clarify the association between specific biological/health-related variables (e.g. self-perceived health, impaired vision) and anxiety in RACF residents is warranted.

In terms of the psychological/emotional/cognitive correlates, the most consistent correlates were depression and

Correlates of anxiety in residential care

Table 4.6 Summary of associations between physical environment/staff/policy correlates and anxiety in RACF residents

Variable	Studies	Strength of evidence[a]	% of studies reporting association	Comment
Type of residence	Thomasma *et al.* (1990)	++++	1/1 (100%)	Residents who relocated to dependent living were significantly more anxious than those who moved to independent living.
Length of time residing at RACF	Baldacchino and Bonello (2013); Drageset *et al.* (2013a); Mullins and Lopez (1982); Parmelee *et al.* (1993); Smalbrugge, Jongenelis, *et al.* (2005a); Smalbrugge, Pot, *et al.* (2005b); Thomasma *et al.* (1990)	+	1/7 (14%)	
Staff's reaction to behavioural issues (negative reaction)	Neville and Teri (2011)	+	1/1 (100%)	The more the behaviour bothered the staff, the more anxiety residents experienced.
Unmet needs	Hancock *et al.* (2006)	+	1/1 (100%)	Residents with clinical anxiety had significantly higher unmet needs compared to those without anxiety.
Perceived inadequacy of care	Smalbrugge, Pot, *et al.* (2005b)	0	0/1 (0%)	
Staff's sense of competence, job satisfaction, age, and level of qualifications	Neville and Teri (2011)	0	0/1 (0%)	
Resident's decisional control in move to RACF	Keister (2006)	0	0/1 (0%)	
Residents' perceived nurse–patient interaction	Haugan *et al.* (2013)	0	0/1 (0%)	Residents' perceived nurse–patient interactions were indirectly associated with anxiety, mediated by the influence of depression.

RACF, Residential aged care facility.
[a]= strength of evidence determined using the following: + = positive association from at least one cross-sectional study; ++ = positive association from at least three cross-sectional studies; +++ = positive association from five or more cross-sectional studies; ++++ = positive association from at least one prospective study; = negative association from at least one cross-sectional study; = negative association from at least three cross-sectional studies; = negative association from five or more cross-sectional studies; = negative association from one prospective study; 0 = no association found.

lower perceived quality of life, with 100% and 87% of studies finding a positive association with anxiety in RACF residents, respectively. External locus of control was also found to be both a significant correlate and predictor of anxiety, although the research was limited to two studies. These findings are somewhat similar to community-based samples, where depression has been found to be the most common factor associated with anxiety (Gonçalves et al., 2011; Vink et al., 2009; Zhang et al., 2014), followed by the experience of a negative life event (Cohen et al., 2006; Diefenbach et al., 2004; Vink et al., 2009) and external locus of control

(Mehta et al., 2003; Smit et al., 2007). While more behavioural problems and experiencing negative life events were also found to have a positive association with anxiety in RACF residents, this was only found in one or two studies, suggesting further research into these variables should be conducted to clarify their relationship. Other psychological variables that were found to be significantly correlated with anxiety were fear of falling, decreased hope, meaning in life, and intrapersonal self-transcendence. The individual's cognitive appraisal of the situation as challenging was also found to be a significant predictor of less anxiety. While

100% of studies found a significant association, the research into these variables was limited to one or two studies. This is concerning, as they are potentially malleable, individual-level factors that have the potential to be useful (once better understood) in devising interventions and preventative strategies. Thus, further research into these variables would be highly beneficial.

With regards to social/cultural factors, lower subjective social support was the only variable found to be consistently studied and associated with anxiety — with 75% of studies finding a significant negative association. This is consistent with findings from community-dwelling samples, where both objective (i.e. number of contacts, frequency of visits from friends) and higher subjective social support is frequently found to have a negative association with anxiety (Almeida et al., 2012; Beekman et al., 2000). Better objectively rated social competence, and higher levels of attachment in RACF residents were found to be significantly associated with anxiety in 50% or more studies; however, again the research was limited to one or two studies. Further research examining the influence or association between social/cultural factors would be highly beneficial, particularly as many (e.g. social support, interpersonal relationships) are variables that can be targeted in interventions.

Lastly, in terms of the physical environment/staff/policy correlates, none were found to have a consistent relationship with anxiety. With the exception of length of time residing in a RACF (which was only found to have a significant positive association in one of the seven studies), all other correlates had been examined in only one or two studies. This prevents reliable conclusions being drawn about their associations with anxiety. Thus, further research examining how the physical environment and staff behaviour is related to the experience of anxiety is warranted.

From a clinical perspective, the above findings suggest that interventions should aim to optimize symptom control by ensuring that depression and pain are managed and treated appropriately, that staff respond sensitively to unmet needs, promote meaningful activities, aim to increase the amount of control residents have over their care/environment, and enhance social support, particularly as residents are settling into their new home. More severe anxiety disorders would warrant specific psychotherapeutic and psychotropic treatment.

Limitations

It is important to acknowledge several limitations of this review. First, the heterogeneity in anxiety measures and subject samples prevented the authors from performing a meta-analysis. Second, the majority of anxiety correlates were only documented in a small number of studies, which limits both the generalizability and reliability of the findings. Further research examining both the same and different variables across different samples, ideally with larger sample sizes, is therefore needed to enable a reliable conclusion on the influence of individual factors. Moreover, there is a lack of research examining the predictors of anxiety among RACF residents, with only one study being found in this review. Given that examining predictors can provide some evidence for causality, future research should aim to conduct studies that enable the computation of predictive modelling techniques (e.g. logistic regression). Last, the majority of research utilized a cross-sectional design. While this also limits our ability to draw conclusions on the causal relationships between the correlates and anxiety, cross-sectional research does provide a foundation of preliminary evidence for potential correlates, from which further prospective studies can be developed.

Conclusions

This review demonstrates that while several variables have been found to have strong and consistent associations with anxiety among RACF residents (e.g. pain,

use of anti-depressants/lithium, depression, and lower perceived quality of life), the majority have been examined by only one or two studies. Further research is therefore needed to clarify the hypothesized relationship between these factors and anxiety. An improvement in our understanding of anxiety within RACFs is required to enable us to plan, design, and implement preventative and intervention strategies for this vulnerable population.

Conflict of interest

None declared.

Key points

a   Anxiety disorders and symptoms are common in aged care residents. Identifying potential risk factors and correlates of late-life anxiety may help to improve the detection and treatment of this condition.

b   The most consistent correlates of anxiety were found to be pain, use of antidepressants/lithium, depression, and lower perceived quality of life.

c   The majority of variables studied were examined by only one or two studies. Further research is therefore needed to clarify and confirm findings.

References

Almeida OP, Draper B, Pirkis J, *et al.* 2012. Anxiety, depression, and comorbid anxiety and depression: risk factors and outcome over two years. *Int Psychogeriatr* **24**(10): 1622–1632. DOI:10.1017/S104161021200107X.

Australian Institute of Health and Welfare. (2012). *Residential Aged Care and Aged Care Packages in the Community: 2011–12.* Retrieved from http://www.aihw.gov.au/aged-care/residential-and-community-2011-12/.

Baldacchino DR, Bonello L. 2013. Anxiety and depression in care homes in Malta and Australia: Part 1. *Br J Nurs* **22**(12): 677–683.

Beekman ATF, De Beurs E, Van Balkom AJLM, et al. 2000. Anxiety and depression in later life: co-occurrence and communality of risk factors. *Am J Psychiatry* **157**(1): 89–95.

Braam AW, Prince MJ, Beekman AT, *et al.* 2005. Physical health and depressive symptoms in older Europeans. Results from EURODEP. *Br J Psychiatry* **187**: 35–42. DOI:10.1192/bjp.187.1.35.

Byers AL, Yaffe K, Covinsky KE, Friedman MB, Bruce ML. 2010. High occurrence of mood and anxiety disorders among older adults: The National Comorbidity Sur-vey Replication. *Arch Gen Psychiatry* **67**(5): 489–496. DOI:10.1001/archgenpsychiatry.2010.35.

Carstensen LL, Fremouw WJ. 1988. The influence of anxiety and mental status on social isolation among the elderly in nursing homes. *Behavioral Residential Treatment* **3**(1): 63–80.

Casten RJ, Parmelee PA, Kleban MH, Powell Lawton M, Katz IR. 1995. The relation-ships among anxiety, depression, and pain in a geriatric institutionalized sample. *Pain* **61**(2): 271–276. DOI:10.1016/0304-3959(94)00185-H.

Chatterjee S, Mehta S, Sherer JT, Aparasu RR. 2010. Prevalence and predictors of anticholinergic medication use in elderly nursing home residents with dementia: analysis of data from the 2004 national nursing home survey. *Drugs and Aging* **27**(12): 987–997. DOI:10.2165/11584430-000000000-00000.

Cheok A, Snowdon J, Miller R, Vaughan R. 1996. Prevalence of anxiety disorders in nursing homes. *Int J Geriatr Psychiatry* **11**(5): 405–410. DOI:10.1002/(SICI)1099-1166(199605)11:5<405::AID-GPS302>3.0.CO;2-O.

Cohen CI, Magai C, Yaffee R, Walcott-Brown L. 2006. The prevalence of anxiety and associated factors in a multiracial sample of older adults. *Psychiatr Serv* **57**(12): 1719–1725. DOI:10.1176/appi.ps.57.12.1719.

Copeland JR, Dewey ME, Wood N, et al. 1987. Range of mental illness among the elderly in the community. Prevalence in Liverpool using the GMS-AGECAT package. *Br J Psychiatry* **150**(6): 815–823. DOI:10.1192/bjp.150.6.815.

Creighton AS, Davison TE, Kissane DW. 2015. The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *Int J Geriatr Psychiatry*. DOI:10.1002/gps.4378.

Davison TE, McCabe MP, Knight T, Mellor D. 2012. Biopsychosocial factors related to depression in aged care residents. *J Affect Disord* **142**(1-3): 290–296.

Diefenbach GJ, Robison JT, Tolin DF, Blank K. 2004. Late-life anxiety disorders among Puerto Rican primary care patients: impact on well-being, functioning, and service utilization. *J Anxiety Disord* **18**(6): 841–858. DOI:10.1016/j. janxdis.2003.10.005.

Drageset J, Eide GE, Ranhoff AH. 2013a. Anxiety and depression among nursing home residents without cognitive impairment. *Scand J Caring Sci* **27**(4): 872–881. DOI:10.1111/j.1471-6712.2012.01095.x.

Drageset J, Eide GE, Ranhoff AH. 2013b. Anxiety and depression and mortality among cognitively intact nursing home residents with and without a cancer diagnosis: a 5-year follow-up study. *Cancer Nurs* **36**(4): E68–E74. DOI:10.1097/ NCC.0b013e31826fcb11.

Dwyer R, Stoelwinder J, Gabbe B, Lowthian J. 2015. Unplanned transfer to emergency departments for frail elderly residents of aged care facilities: a review of patient and organizational factors. *J Am Med Dir Assoc* **16**(7): 551–562.

Forlani M, Morri M, Belvederi Murri M, et al. 2014. Anxiety symptoms in 74+ community-dwelling elderly: associations with physical morbidity, depression and alcohol consumption. *PLoS One* **9**(2): . DOI:10.1371/journal.pone.0089859.

Gonçalves DC, Pachana NA, Byrne GJ. 2011. Prevalence and correlates of generalized anxiety disorder among older adults in the Australian National Survey of Mental Health and Well-Being. *J Affect Disord* **132**(1–2): 223–230. DOI:10.1016/j. jad.2011.02.023.

Grenier S, Schuurmans J, Goldfarb M, et al. 2011. The epidemiology of specific phobia and subthreshold fear subtypes in a community-based sample of older adults. *Depress Anxiety* **28**(6): 456–463. DOI:10.1002/da.20812.

Gum AM, King-Kallimanis B, Kohn R. 2009. Prevalence of mood, anxiety, and substance-abuse disorders for older Americans in the national comorbidity survey-replication. *Am J Geriatric Psychiatry* **17**(9): 769–781. DOI:10.1097/ JGP.0b013e3181ad4f5a.

Hancock GA, Woods B, Challis D, Orell M. 2006. The needs of older people with dementia in residential care. *Int J Geriatr Psychiatry* **21**(1): 43–49. DOI:10.1002/ gps.1421.

Haugan G. 2014. Meaning-in-life in nursing-home patients: a correlate with physical and emotional symptoms. *J Clin Nurs* **23**(7-8): 1030–1043. DOI:10.1111/ jocn.12282.

Haugan G, Innstrand ST, Moksnes UK. 2013. The effect of nurse–patient interaction on anxiety and depression in cognitively intact nursing home patients. *J Clin Nurs* **22**(15-16): 2192–2205. DOI:10.1111/jocn.12072.

Hoe J, Hancock G, Livingston G, Orrell M. 2006. Quality of life of people with dementia in residential care homes. *Br J Psychiatry* **188**(MAY): 460–464. DOI:10.1192/bjp.bp.104.007658.

Junginger J, Phelan E, Cherry K, Levy J. 1993. Prevalence of psychopathology in elderly persons in nursing homes and in the community. *Hospital and Community Psychiatry* **44**(4): 381–383.

Kamble P, Chen H, Sherer JT, Aparasu RR. 2009. Use of antipsychotics among elderly nursing home residents with dementia in the US: an analysis of national survey data. *Drugs and Aging* **26**(6): 483–492. DOI:10.2165/00002512-200926060-00005.

Karkare SU, Bhattacharjee S, Kamble P, Aparasu R. 2011. Prevalence and predictors of antidepressant prescribing in nursing home residents in the United States. *Am J Geriatric Pharmacotherapy* **9**(2): 109–119. DOI:10.1016/j.amjopharm. 2011.03.001.

Keister KJ. 2006. Predictors of self-assessed health, anxiety, and depressive symptoms in nursing home residents at week 1 postrelocation. *J Aging Health* **18**(5): 722–742. DOI:10.1177/0898264306293265.

Kirmizioglu Y, Doan O, Kuu N, Akyüz G. 2009. Prevalence of anxiety disorders among elderly people. *Int J Geriatr Psychiatry* **24**(9): 1026–1033. DOI:10.1002/ gps.2215.

Kmet LM, Lee RC, Cook LS. 2004. *Standard Quality Assessment Criteria for Evaluating Primary Research Papers from a Variety of Fields*. Alberta Heritage Foundation for Medical Research: Alberta, Canada.

Landi F, Dell'Aquila G, Collamati A, et al. 2015. Anticholinergic drug use and negative outcomes among the frail elderly population living in a nursing home. *J Am Med Dir Assoc* **15**(11): 825–829.

Lapane KL, Quilliam BJ, Chow W, Kim M. 2012. The association between pain and measures of well-being among nursing home residents. *J Am Med Dir Assoc* **13**(4): 344–349. DOI:10.1016/j.jamda.2011.01.007.

Mehta KM, Simonsick EM, Penninx BWJH, et al. 2003. Prevalence and correlates of anxiety symptoms in well-functioning older adults: findings from the health aging and body composition study. J *Am Geriatr Soc* **51**(4): 499–504. DOI:10.1046/j.1532-5415.2003.51158.x.

Milliren JW. 1977. Some contingencies affecting the utilization of tranquilizers in long term care of the elderly. *J Health Soc Behav* **18**(2): 206–211.

Moher D, Liberati A, Tetzlaff J, Altman DG. 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med* **6**(7e1000097.): DOI:10.1371/journal.pmed.1000097.

Moreno RP, Solana EI, Rico MA, Fernandez LML. 2008-2009. Death anxiety in institutionalized and non-institutionalized elderly people in Spain. *Omega* **58**(1): 61–76.

Mullins LC, Lopez MA. 1982. Death anxiety among nursing home residents: a comparison of the young-old and the old-old. *Death Educ* **6**(1): 75–86. DOI:10.1080/07481188208252117.

Neville C, Teri L. 2011. Anxiety, anxiety symptoms, and associations among older people with dementia in assisted-living facilities. *Int J Ment Health Nurs* **20**(3): 195–201. DOI:10.1111/j.1447-0349.2010.00724.x.

Nijk RM, Zuidema SU, Koopmans RTCM. 2009. Prevalence and correlates of psychotropic drug use in Dutch nursing home patients with dementia. *Int Psychogeriatr* **21**(3): 485–493. DOI:10.1017/S1041610209008916.

Parmelee PA, Katz IR, Lawton MP. 1993. Anxiety and its association with depression among institutionalized elderly. *Am J Geriatric Psychiatry* **1**(1): 46–58.

Prado-Jean A, Couratier P, Druet-Cabanac M, et al. 2010. Specific psychological and behavioral symptoms of depression in patients with dementia. *Int J Geriatr Psychiatry* **25**(10): 1065–1072. DOI:10.1002/gps.2468.

Ribeiro O, Teixeira L, Araújo L, Afonso RM, Pachana N. 2015. Predictors of anxiety in centenarians: health, economic factors, and loneliness. *Int Psychogeriatr* **27**(7): 1167–1176. DOI:10.1017/S1041610214001628.

Sharaf AY, Ibrahim HS. 2008. Physical and psychosocial correlates of fear of falling among older adults in assisted living facilities. *J Gerontol Nurs* **34**(12): 27–35. DOI:10.3928/00989134-20081201-07.

Smalbrugge M, Jongenelis L, Pot AM, Beekman ATF, Eefsting JA. 2005a. Comorbidity of depression and anxiety in nursing home patients. *Int J Geriatr Psychiatry* **20**(3): 218–226. DOI:10.1002/gps.1269.

Smalbrugge M, Jongenelis LK, Pot AM, Beekman ATF, Eefsting JA. 2007. Pain among nursing home patients in the Netherlands: prevalence, course, clinical correlates, recognition and analgesic treatment—an observational cohort study. *BMC Geriatr* **7**: . DOI:10.1186/1471-2318-7-3.

Smalbrugge M, Pot AM, Jongenelis K, Beekman ATF, Eefsting JA. 2005b. Prevalence and correlates of anxiety among nursing home patients. *J Affect Disord* **88**(2): 145–153. DOI:10.1016/j.jad.2005.06.006.

Smalbrugge M, Pot AM, Jongenelis L, et al. 2006. The impact of depression and anxiety on well being, disability and use of health care services in nursing home patients. *Int J Geriatr Psychiatry* **21**(4): 325–332. DOI:10.1002/gps.1466.

Smit F, Comijs H, Schoevers R, et al. 2007. Target groups for the prevention of late-life anxiety. *Br J Psychiatry* **190**(MAY): 428–434. DOI:10.1192/bjp.bp.106.023127.

Thomasma M, Yeaworth RC, McCabe BW. 1990. Moving day: relocation and anxiety in institutionalized elderly. *J Gerontol Nurs* **16**(7): 18–25.

Van Almenkerk S, Depla MFIA, Smalbrugge M, Eefsting JA, Hertogh CMPM. 2015. Pain among institutionalized stroke patients and its relation to emotional distress and social engagement. *Int J Geriatr Psychiatry* **30**(10): 1023–1031. DOI:10.1002/ gps.4256.

Vink D, Aartsen MJ, Comijs HC, et al. 2009. Onset of anxiety and depression in the aging population: comparison of risk factors in a 9-year prospective study. Am J Geriatric Psychiatry **17**(8): 642–652. DOI:10.1097/JGP.0b013e3181a65228.

Vink D, Aartsen MJ, Schoevers RA. 2008. Risk factors for anxiety and depression in the elderly: a review. *J Affect Disord* **106**(1–2): 29–44. DOI:10.1016/j. jad.2007.06.005.

Voyer P, Verreault R, Mengue PN, Morin CM. 2006. Prevalence of insomnia and its associated factors in elderly long-term care residents. *Arch Gerontol Geriatr* **42**(1): 1–20. DOI:10.1016/j.archger.2005.06.008.

Walid MS, Zaytseva N. 2009. Pain in nursing home residents and correlation with neuropsychiatric disorders. *Pain Physician* **12**(5): 877–880.

Wolitzky-Taylor KB, Castriotta N, Lenze EJ, Stanley MA, Craske MG. 2010. Anxiety disorders in older adults: a comprehensive review. *Depress Anxiety* **27**(2): 190–211. DOI:10.1002/da.20653.

Zhang X, Norton J, Carrière I, et al. 2014. Generalized anxiety in community-dwelling elderly: prevalence and clinical characteristics. *J Affect Disord* **172**: 24–29. DOI:10.1016/j.jad.2014.09.036.

Zuidema SU, De Jonghe JFM, Verhey FRJ, Koopmans RTCM. 2009. Predictors of neuropsychiatric symptoms in nursing home patients: influence of gender and dementia severity. *Int J Geriatr Psychiatry* **24**(10): 1079–1086. DOI:10.1002/gps.2225.

4.3.   SUMMARY AND CONCLUSION

In this chapter, a paper was presented that provided a systematic review of the correlates of anxiety symptoms and disorders in RACF settings. Not only does this paper provide an introduction to the third empirical study of this thesis (*Chapter eight*), it also highlights how the majority of variables examined have only been investigated by one or two studies. Thus, it is clear that further research within RACFs is needed to confirm the findings of previous studies, as well as identify other potential factors that may be associated with increased anxiety. In particular, based on this review it was considered important that more research be conducted into factors that could potentially be modified or targeted within the aged care settings (e.g., mastery, social engagement) as well identify factors that may possibly predispose residents to experience anxiety (e.g., attachment style), particularly as findings were either mixed or limited to only a small number of studies. It is hoped that the paper in *Chapter eight* will contribute towards growing this knowledge.

Together with *Chapters two* and *three*, a thorough introduction of and overview of our current understanding of the prevalence, correlates, and assessment of anxiety within RACFs has been provided, with the gaps and limitations of previous research highlighted. In the next chapter, the extended methodology for all three studies is provided. This provides important context for the three empirical papers that follow in *Chapters six*, *seven*, and *eight*.

CHAPTER FIVE

EXTENDED RESEARCH METHODOLOGY

5.1. PREAMBLE TO THE EXTENDED METHODOLOGY

The aim of this chapter is to provide a detailed description of the methodology employed in the study and provide additional information that could not be accommodated within the chapters submitted for publication (*Chapters six, seven, and eight*). The chapter begins with a description of the research design, the inclusion criteria employed to determine participation eligibility, and an overview of participant recruitment detailing reasons for refusal or exclusion. This is followed by a description of the participants that comprised the sample, the measures employed, and the procedures used to conduct the study. The chapter then concludes with an overview of the analytic strategy utilised to address the aims of the study.

5.2. **RESEARCH DESIGN**

The study employed a cross-sectional, observational design. Not only did this allow for a detailed examination of the prevalence of anxiety disorders during the period of March 2015 and November 2016, it also enabled the identification of factors associated with anxiety. Given the paucity of research into anxiety in RACFs, a cross-sectional study was selected as it is an ideal method to collect initial descriptive information about what is occurring at one point of time, which is vital to building the evidence base (Carlson & Morrison, 2009).

5.3. **RECRUITMENT OF RESIDENTIAL AGED CARE FACILITIES**

Using a random number generator, RACFs located in the southern and eastern regions of metropolitan Melbourne, Australia were randomly selected from the Australian Government's Department of Health's Aged Care Services list (Australian Government, 2015). A total of 19 RACFs were invited to participate via phone call and email, during which the candidate provided each facility's manager and/or director of nursing (DoN) with an overview of the research objectives, participant inclusion and exclusion criteria, and what participation involved. If the manager or the DoN were interested in having their facility take part, they signed a permission letter (see Appendix C) outlining their approval for the study to be conducted at their RACF.

Out of the 19 RACFs contacted, 12 facilities (63.2%) agreed to take part. Of the facilities that did not participate, three were private companies, two were religious, one was community-based, and one was managed by the local government. Four of these facilities stated that they had too many current demands and so did not have capacity to participate in the study, one was no longer a residential aged care facility (it had been redeveloped as independent living apartments), one was an ethnic-specific facility (with more than 80% of residents being non-English speaking), while one facility stated that they did not participate in research due to privacy concerns. Mann-Whitney tests revealed no significant differences between facilities that did and did not participate in the study with regards to facility type (p = .432), size (i.e., number of beds) (p = .180), or location (p = .437). The 12 participating RACFs included private companies (58.3%), not-for-profit (8.3%) and religious (25.0%) organisations, and government funded facilities (8.3%). The ratio of each type of RACF recruited is similar to that of the broader RACF sector in metropolitan Melbourne, where 50.3% are private incorporated bodies, 18.7% are religious facilities, 8.1% are not-for profit, and 8.6% are government

funded facilities (Australian Government, 2015).

5.4. PARTICIPANTS

5.4.1. Participant Inclusion Criteria and Recruitment. Aged care residents were eligible to participate in the study if they met the following criteria: (1) were aged at least 65 years old; (2) had resided at the RACF for at least three months prior to the study commencing; (3) obtained a Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975) score ≥18; (4) were able to communicate fluently in English; (5) did not have an intellectual disability; (6) did not have a diagnosis of bipolar disorder or schizophrenia; and (6) did not have an acute, severe medical condition, such that participation in the study would compromise their health.

Participants were excluded according to the criteria outlined above for the following reasons: (1) being aged less than 65 years old meant the resident was not considered an 'older adult', as defined by the AIHW (2017); (2) individuals residing at the RACF for less than three months were excluded to ensure anxiety symptoms were not related to an adjustment disorder; (3) residents who obtained an MMSE score < 18, were not fluent in English or had an intellectual disorder were excluded to ensure participants had a good understanding of the questions and therefore provided consistent and informed responses; and (4) residents with bipolar disorder or schizophrenia were excluded as both disorders have been found to be significantly associated with increased cognitive dysfunction, dementia, confusion, and reduced insight in older adults (Depp et al., 2007; Gildengers et al., 2012; Kohen, Lester, & Lam, 2010), which could lead to inconsistent responses.

Participants were recruited from the 12 participating RACFs in southern and eastern metropolitan Melbourne between March 2015 and November 2016. After exclusion criteria were applied, 425 residents were considered by each facility's manager to be eligible to participate. Of these, 180 agreed to participate and successfully completed the study, corresponding to a recruitment rate of 42.4%. The present study did not have ethical approval to collect demographic information about residents who declined to participate. However, Figure 5.1 provides an outline of the reasons for residents' ineligibility and exclusion from the study.

5.4.2. Sample Characteristics. Of the 180 residents that comprised the sample, 120 (66.7%) were female and 60 (33.3%) were male, with the mean age being 85.4 years (*SD* = 7.4, range = 66-101 years). Overall, participants had spent an average of 2.6 years

(*SD* = 2.5, range = 0.2-12.6 years) residing at the RACF and had a mean of 10.8 years of formal education (*SD* = 3.3, range = 1-21 years). Additional demographic and clinical characteristics of the sample can found in Table 5.1.

5.5. MATERIALS

5.5.1. Demographic and Health Information. The following demographic and health information was obtained from participants' files held at the RACF: date of birth; gender; highest level of formal education; marital status; date of admission to the facility; current medication regimen; whether or not there was a chart diagnosis of dementia and if so, the type of dementia; whether or not there was an indication of anxiety or an anxiety disorder and if so, what had been recorded and the date it was recorded; current treatment for anxiety (pharmacological and non-pharmacological); whether or not there was an indication of depression and if so, what had been recorded, the date it was recorded, and current treatment for depression (pharmacological and non-pharmacological).

5.5.2. Mini-Mental State Examination (MMSE; Folstein et al., 1975). The MMSE was administered to assess participants' level of cognitive functioning. This measure is a commonly used, brief cognitive screening instrument comprising 11-items divided into two sections. The first section requires verbal responses and measures participants' orientation to time and place, immediate and delayed memory recall, and attention. The second section consists of reading and writing and assesses the individual's language and comprehension abilities and visuospatial skills. The MMSE provides an overall score out of 30, with commonly accepted cut-off points being: 24-30 for normal cognition; 18-23 for mild cognitive impairment (MCI); while 0-17 suggests moderate to severe cognitive impairment (Tombaugh & McIntyre, 1992). Overall, studies indicate the MMSE to be a psychometrically reliable and valid screening tool to detect cognitive impairment in older adults (Fountoulakis, Tsolaki, Chantzi, & Kazis, 2000; Jones & Gallo, 2000; Tombaugh & McIntyre, 1992).

5.5.3. MINI International Neuropsychiatric Interview version 7.0.0 (MINI; Sheehan et al., 1998). The MINI was used to diagnose MDD and current threshold and subthreshold Generalised Anxiety Disorder (GAD), Specific Phobia, Social Anxiety Disorder, Agoraphobia, and Panic Disorder according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013). Taking approximately 20-30 minutes to complete, the MINI is a widely used short,
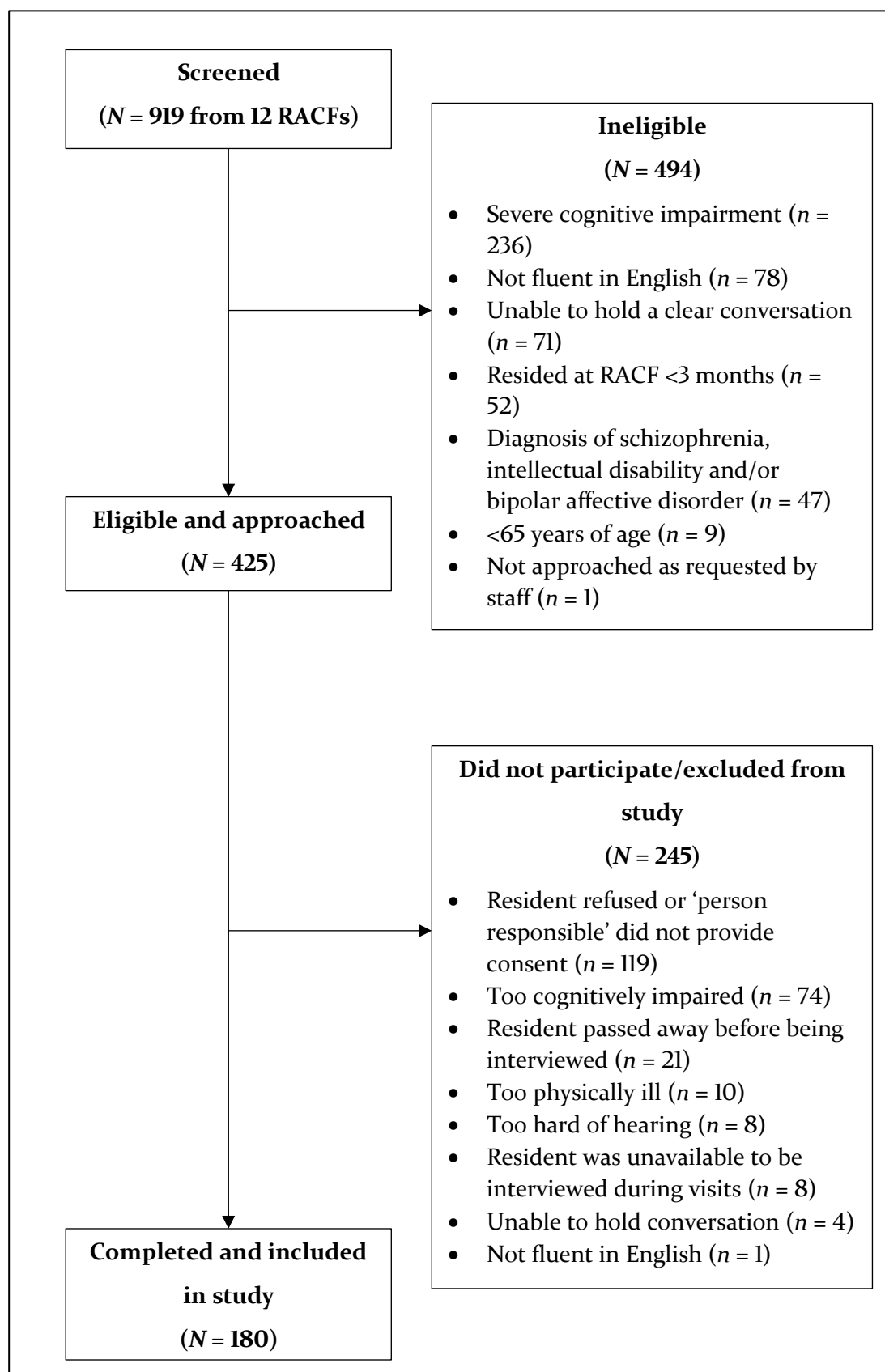
Figure 5.1 Participant recruitment flowchart.

Table 5.1

Demographic and Clinical Characteristics of the Sample (N = 180)

Characteristic	*N*	%	Mean	*SD*	Range
Marital status					
Widowed	96	53.3			
Divorced/separated	36	20.0			
Married	34	18.9			
Never married/single	12	6.7			
Other	2	1.1			
Cognitive functioning (MMSE Score)			24.7	3.3	1-21
Normal cognition (24-30)	115	63.9			
MCI (18-23)	65	36.1			
Dementia diagnosis/cognitive impairment noted on file[a]	81	45.0			
Type recorded					
Memory loss	24	13.3			
MCI	14	7.8			
Dementia	13	7.5			
Alzheimer's Disease	10	5.6			
MOCI	7	3.9			
Vascular Dementia	5	2.8			
Cognitive impairment	3	1.7			
Mixed Dementia	2	1.1			
Mild Dementia	2	1.1			
Premorbid cognitive deficit	1	0.6			

Note. SD = standard deviation; MMSE = Mini-Mental State Examination; MCI = Mild cognitive impairment; MOCI = Moderate cognitive impairment.
[a]*n* = 179

structured diagnostic interview designed to meet the need for a brief but accurate psychiatric assessment that can be used for clinical trials, epidemiological studies, and outcome tracking in non-research clinical settings. It has been well validated for diagnosing psychiatric disorders, with high concordance rates reported with the Composite International Diagnostic Interview (CIDI) and Structured Clinical Interview for DSM Diagnoses (SCID) (Lecrubier et al., 1997; Sheehan et al., 1997).

While not specifically developed for older adults, the MINI has been frequently used within this age group in community (Karlsson et al., 2009; Norton et al., 2012; Ritchie et al., 2004; Zhang et al., 2015) and aged care settings (Arvaniti et al., 2005; Dozeman et al., 2012). Furthermore, it has also been used as the gold-standard measure in validation studies within these contexts (e.g., Byrne et al., 2010; Cheung, Patrick, Sullivan, Cooray, & Chang, 2012; Pachana et al., 2007). Permission to use this measure free of charge was granted by the author of the MINI, Professor David Sheehan (see Appendix D).

Using information collected by the MINI, subthreshold anxiety disorders were diagnosed using criteria developed by Angst, Merikangas, and Preisig (1997) and Heun, Papassotiropoulos, and Ptok (2000) (see Table 5.2). These criterion have been previously used in research examining anxiety within RACFs (e.g., Smalbrugge, Pot, Jongenelis, Beekman, & Eefsting, 2005). Subthreshold disorders were diagnosed in participants with other threshold or subthreshold anxiety disorders, but were only diagnosed if the related threshold diagnosis was absent (e.g., subthreshold GAD was only diagnosed in participants who did not meet criteria for threshold GAD).

Table 5.2

Diagnostic Criteria for Subthreshold Anxiety Disorders (According to Criteria of Angst et al. (1997) and Heun et al. (2000))

Anxiety disorder	Subthreshold criteria
Panic disorder	A subthreshold panic attack (a panic attack with one or more physical symptoms) during the last 4 weeks.
Agoraphobia	Unreasonable fear in places or situations from which it is difficult to leave during the last 4 weeks and at least some avoidance or symptoms of anxiety.
Specific phobia	Persistent fear of circumscribed stimulus during the last 4 weeks and at least some avoidance or consequences.
Social anxiety disorder	Persistent fear of situations in which a person is exposed to social interactions during the last 4 weeks and at least some avoidance or consequences.
GAD	Unrealistic anxiety or worry about two or more life situations during the last 6 months and at least one physical or vegetative symptom, and person finds it distressing.

Note. GAD = Generalized Anxiety Disorder.

5.5.4.   Geriatric Anxiety Inventory (GAI; Pachana et al., 2007). The GAI is a 20-item self-report measure specifically designed to assess for the experience of general anxiety symptoms in older adults over the past week. Using a dichotomous agree/disagree format to ensure ease of understanding, each item utilises language commonly employed by older adults to describe anxiety and worry (e.g., *"butterflies in my stomach"*). Total scores range from 0 to 20, with higher scores indicating greater anxiety levels. As the psychometric properties of the GAI have been extensively discussed in Chapter two, they will not be repeated here. Briefly, this measure has been found to have strong reliability and validity in both community-dwelling (Byrne et al., 2010; Gould et al., 2014) and RACF elderly (Gerolimatos, Gregg, & Edelstein, 2013) populations. In the current study, the GAI was found to have excellent internal reliability as indicated by a Cronbach's alpha of .95.

5.5.5.   Hospital Anxiety and Depression Scale – Anxiety Subscale (HADS-A; Zigmond & Snaith, 1983). The HADS-A is a seven-item self-report subscale of the HADS that assesses for the presence and severity of anxiety symptoms over the past week. Originally designed to assess clinically significant anxiety in medical outpatients, the HADS-A excludes somatic symptoms. Each item is rated from 0 to 3, with a possible total subscale score ranging from 0 to 21. Higher scores indicate higher levels of anxiety. As the psychometrics of the HADS-A are discussed in detail in Chapter two, they will not be repeated here. Briefly, the psychometric properties of the HADS-A within elderly populations are not well established (e.g., Cheung et al., 2012; Davies, Burn, McKenzie, Brothwell, & Wattis, 1993; Flint & Rifat, 2002), with only one study to date having examined its reliability and validity within an RACF population (Haugan & Drageset, 2014). In the current sample, the HADS-A had a Cronbach's alpha of .80.

5.5.6.   Rating Anxiety in Dementia Scale (RAID; Shankar, Walker, Frost, & Orrell, 1999). The RAID is an 18-item clinical rating scale developed to assess anxiety symptoms in people with dementia. The measure is completed by the clinician using information from interviews conducted with the resident and an informant, and comprises four subscales: worry, apprehension and vigilance, motor tension, and autonomic hypersensitivity. Scores range from 0 to 54, with items rated on a scale of 0 (absent) to 3 (severe). Higher scores indicate higher levels of anxiety.

As the RAID's psychometric properties are extensively discussed in Chapter two, they will not be repeated here. Briefly, the RAID has been used and validated with dementia patients in inpatient wards, day centres, hospitals, geriatric clinics (Shankar et al., 1999; Snow et al., 2012; Twelftree & Qazi, 2006), and recently in RACFs (Goyal,

Bergh, Engedal, Kirkevold, & Kirkevold, 2016). In the current sample, a Cronbach's alpha of .85 was found.

In the current study, the RAID was completed using information from both a participant interview and an interview with an RACF staff member who had worked closely with the participant for at least the previous two weeks. As the participant and staff interview were conducted separately, their responses to each item were recorded and scored separately. The final score for each item was then determined using clinical judgement to decide whose report was given more weight based on who was likely to be most accurate. For each item, the frequency, and level of distress and interference that was experienced by the resident was noted, with the scoring rules by Snow et al. (2012) used (see Appendix E).

5.5.7. Revised Index for Social Engagement (RISE; Gerritsen et al., 2008). The RISE is a six-item observational scale specifically developed to assess positive features of RACF residents' social behaviour (e.g., *"Does the resident accept invitations to most group activities?; Is the resident at ease interacting with others?"*). Each item is measured using a dichotomous yes/no scale, with possible scores ranging from 0 to 6. Higher scores indicated greater levels of social engagement. With regards to its psychometric properties, the RISE has been found to have good internal consistency (Cronbach's alpha ≥ .70), excellent convergent validity with the average time involved in activities (r = .58), and adequate inter-rater reliability (≥ .40) (Gerritsen et al., 2008; Yoon & Kim, 2016). To ensure an accurate assessment of each participants' social engagement was made, in the current study the RISE was completed with a staff member who was familiar with the resident and had been working closely with them for at least the previous two weeks.

5.5.8. Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). The MSPSS is a 12-item self-report measure that assesses participants' perceptions of support from three sources: family (e.g., *"I can talk about my problems with my family"*), friends (e.g., *"I can count on my friends when things go wrong"*), and a significant other (*"I have a special person who is a real source of comfort to me"*). Each item is rated using a seven-point Likert-type scale (1 = very strong disagree; 7 = very strongly agree), with total scores ranging from 7 to 84. Higher scores indicate greater perceived levels of social support. With regards to its psychometric properties, the MSPSS has been found to have good internal reliability (Cronbach's alpha = .84 to .94), test-retest reliability (r = .73) and validity among older adults (Stanley, Beck, & Zebb, 1998; Zimet, S., Farley, Werkman, & Berkoff, 1990).

Within the current sample, the total score of the MSPSS was found to have a Cronbach's alpha of .83.

5.5.9. Pearlin Mastery Scale (Pearlin & Schooler, 1978). The extent to which participants perceived they had control over events and ongoing situations (rather than being fatalistically ruled) was assessed using the Pearlin Mastery Scale. The scale comprises seven-items that tap into sense of control (e.g., *"I have little control over the things that happen to me"*) and are answered using a four-point Likert-type scale (1 = strongly disagree; 4 = strongly agree). Possible scores range from 7 to 28, with higher scores indicating a greater perceived level of mastery. With regards to psychometrics, the scale has demonstrated good internal reliability (Cronbach's alpha = 0.69 to 0.76), concurrent and discriminant validity (Pearlin, Lieberman, Menaghan, & Mullan, 1981; Togari & Yonekura, 2015), and has previously been used with older community-dwelling adults (e.g., Beekman et al., 2000; De Beurs et al., 2001) as well as in RACF settings (e.g., Keister, 2006). In the current study, the measure obtained a Cronbach's alpha of .61.

5.5.10. Functional Comorbidity Index (FCI; Groll, To, Bombardier, & Wright, 2005). The FCI is an 18-item, diagnosis-based list of comorbid physical conditions (e.g., arthritis, stroke) designed to predict physical function, with physical functioning and not mortality being the outcome of interest. One point is given for each diagnosis present, with the final score being the sum of the items. Thus, higher scores indicated the presence of more physical health conditions. In the present study, the FCI was used as a checklist, with the candidate examining participants' files and recording which conditions were present. The three items measuring anxiety, depression, and body mass index were excluded in this study as anxiety was the outcome variable, depression was assessed using a diagnostic interview (the MINI), and the ability to ascertain an accurate measurement of participants' current weight and height to calculate body mass index was considered unfeasible. Thus, a total of 15 comorbid conditions were assessed, with the possible total score ranging from 0 to 15. Although originally developed for use in the general population, the FCI has previously been used with older adults living in RACFs (e.g., Drageset et al., 2013, 2015).

5.5.11. Katz Index of Activities of Daily Living (Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963). The Katz Index of Activities of Daily Living (ADLs) was used to assess participants' functional status. The Index ranks participants' ability to perform six ADLs: bathing, dressing, toileting, transferring, continence, and feeding. Each of the six items are scored using a dichotomous yes/no scale, with the total possible score

ranging from 0 to 6. Higher scores indicate greater functional ability. Overall, the psychometric properties of this index has been found to be good, with evidence of high levels of reliability and validity in elderly populations (Arik et al., 2015; Brorsson & Asberg, 1984). In the current study, this measure had a Cronbach's alpha of .80.

5.5.12. Self-Perceived Health. Participants' subjective perception of their physical health was assessed via one-item (*"How would you rate your overall health at the present time?"*). Participants responded to this question by rating their current health using a four-point Likert-type scale from 1 (poor) to 4 (excellent), with a higher rating indicating greater self-perceived health. Although the use of only one-item can be seen as a limitation (as discussed in later chapters), it is frequently used in geriatric research to assess self-perceived health (e.g., Chou, Mackenzie, Liang, & Sareen, 2011; De Beurs et al., 2001).

5.5.13. Experience in Close Relationships – Relationship Structures Adult Attachment Questionnaire (ECR-RS; Fraley, Waller, & Brennan, 2000). Participants' general attachment style was assessed using the ECR-RS; a nine-item self-report measure that assesses two underlying global attachment patterns: avoidance (six-items that assess discomfort with emotional closeness to and dependency on partners (e.g., "*I usually discuss my problems and concerns with others*")) and anxiety (three-items that measure excessive worry and concern that a partner will not be available when support is needed (e.g., "*I often worry that other people do not really care for me*")). Each item is rated on a seven-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree), with two separate total scores for the avoidance and anxiety dimensions provided. Each subscale score ranges from 1 to 7, with low scores on both these dimensions reflecting attachment security, while higher scores represent higher attachment avoidance and anxiety, respectively. In the current study, participants were instructed to rate each item with respect to how they feel about "close relationships in general" to identify their global attachment style. Previous research has found the ECR-RS to have good reliability and validity (Fraley, Heffernan, Vicary, & Brumbaugh, 2011; Moreira, Martins, Gouveia, & Canavarro, 2015). In the current sample, Cronbach's alpha for the avoidant and anxiety attachment dimensions were .58 and .75, respectively.

5.5.14. Recent Negative Life Events. Based on the findings of previous literature (e.g., Smalbrugge, Pot, et al., 2005; Vink et al., 2009), an eight-item dichotomous (yes/no) scale was developed and used to assess whether each participant had experienced any of the following life events within the past 12 months: the death

of a partner or family member; partner or family member becoming ill; or conflict with partner, family member, other RACF residents, or nursing staff. Total scores ranged from 0 to 8, with higher scores indicating that the participant has experienced more of the assessed life events within the past year.

The eight events mentioned above were selected as they were likely to have occurred recently, and have previously been found to be associated with the onset of depression and anxiety in later-life (De Beurs et al., 2001). Other stressful life events found to be associated with a reduction in wellbeing (e.g., change in financial state, being fired from work, losing driver's license) were excluded as they were not considered relevant for RACF residents.

5.5.15. Recent Fall. Participants' experience of a recent fall was assessed via one dichotomous (yes/no) item (*"Have you had a fall in the last six months?"*).

5.6. PROCEDURE

5.6.1. Ethics Approval. Ethics approval for the completion of this study was obtained from the Monash University Human Research Ethics Committee (see Appendix F).

5.6.2. Data Collection. Once consent for the study to be conducted at an RACF had been provided by the facility manager or DoN, the candidate met with them to screen all current residents using the inclusion/exclusion criteria. A list of the initials and room numbers of those residents identified as being potentially eligible to participate was then provided to the candidate, who visited each resident in their room at the facility and invited them to participate in the study.

5.6.2.1. Obtaining informed consent. If the resident was interested in participating, the candidate assessed their ability to provide informed consent using Warner, McCarney, Griffin, Hill, and Fisher's (2008) consenting procedure for people with dementia. This process is based on British case law, which holds that an adult is deemed to have capacity if they can:

(a) Understand and retain information about the study or treatment;

(b) Believe it (that is, the resident is oriented in reality and understands the risks and benefits of participation); and

(c) Weigh it in the balance to arrive at a choice.

Additionally, the participant must have also been able to communicate his or her choice (of whether or not they would like to participate in the research) to the researcher.

Based on the principles outlined above, Warner et al.'s (2008) consenting procedure assesses whether the individual meets the criteria to provide informed consent for research. The four-step process required that the resident:

1. Be provided with detailed written (in the form of the explanatory statement, see Appendix G) and verbal information about the study, with this including: (a) the objectives of the study, (b) potential risks and inconveniences of participation, (c) what participation in the research involves, and (d) the opportunity to withdraw at any time. Depending on the ability of the participant to assimilate this information, the researcher will repeat this information as necessary.

2. Be provided with sufficient time to understand and retain this information.

3. Be tested on whether they have retained salient information, by the researcher asking them to repeat relevant information about the study and demonstrate an understanding of this. This will be done by asking the resident to verbally describe to the researcher: (a) what the aim of the study is; (b) what they understand participation to involve; (c) what the potential risks, benefits, and inconveniences are; (d) whether or not they understand that participation is voluntary and that they can withdraw at any time.

4. If the resident is able to relay relevant information about the study, they will then be asked whether or not they want to participate, without coercion.

If the resident was able to successfully complete all four stages, he/she was deemed to have met the criteria for informed consent, and signed the Consent Form for Study Participants (see Appendix H). However, if a potential participant failed at any of the four stages, they were considered to lack the capacity to provide informed consent themselves and the 'person responsible' for the resident (which was typically next-of-kin or a son/daughter) was required to provide consent on their behalf.

Due to privacy reasons, initial contact with the 'person responsible' was done by the facility manager or DoN, who provided them with an explanatory statement (see Appendix I) and consent form (see Appendix J). Due to the time required by staff to obtain written consent, the 'person responsible' also had the option to access the explanatory statement and sign the consent form online, or provide permission for the facility manager or DoN to sign the consent form on their behalf.

5.6.2.2. Participant interview and completion of measures. Once written informed consent had been obtained, the MMSE was administered to each consenting resident and those scoring <18 were excluded from the study. Those who scored ≥ 18

then completed the anxiety disorders and major depressive disorder modules of the MINI for DSM-5, the measures assessing potential anxiety correlates, as well as the three anxiety screening tools (i.e., GAI, HADS-A, and RAID).

All interviews and measures were completed with the participant in their room located at the RACF. Although a number of the measures were originally developed to be self-administered, all were completed in a face-to-face interview mode with the researcher. This was to ensure participant's had a good understanding of what was being asked and had an opportunity to ask any clarifying questions.

Following the participant interview, the RAID, Katz's Index of ADLs, and the RISE were all completed with a staff member familiar with the participant. To ensure the information provided by the informant was as accurate as possible, the measures were completed in an interview-format with a member of staff who had been working with the participant for at least the previous two weeks.

5.7. STATISTICAL ANALYSES

5.7.1. Sampling Power Analysis. Using the formula by Daniel (1999) and recommended by Naing, Winn, and Rusli (2006), an a priori sample size calculation was conducted to determine the necessary sample size needed to estimate population prevalence with good precision (5%). For the prevalence study, it was found that a total of 171 participants was needed. This was determined by using the average prevalence of any anxiety disorder reported by previous RACF prevalence studies (12.78%) as the estimate of prevalence in the formula, as suggested by Naing et al. (2006). As our total sample was 180, this enabled the completion of a multiple regression analysis to assess the correlates of anxiety symptoms. Using the rule of $N \geq 50 + 8m$ (where m = number of predictors) recommended by Tabachnick and Fidell (2007), up to 16 variables were able to be entered into the model.

5.7.2. Data Entry, Screening, and Analysis. All data were entered, screened and analysed by the candidate using version 22 of the Statistical Package for the Social Sciences (SPSS). MedCalc was also used for the validation study (research aim three). Unless otherwise stated, an alpha of .05 was used to determine statistical significance.

5.7.2.1. Missing data. Prior to any analyses, the dataset was screened for accuracy of data entry and missing data. As one participant did not provide consent to check their file, the overall sample size for the recording of anxiety and dementia diagnoses by GPs and RACF staff was 179. Similarly, one participant did not complete the Social Anxiety Disorder and Specific Phobia subsections of the MINI, and therefore

the total sample size for the prevalence of these threshold and subthreshold anxiety disorders was 179. All other information collected for these two participants was retained for all other analyses.

5.7.2.2. Research aim one: Estimating the prevalence of anxiety disorders and comorbid MDD among older adults living in RACFs. Percentages were calculated to determine the prevalence of overall and specific threshold and subthreshold anxiety disorders, MDD, and comorbid anxiety and MDD within the sample. As suggested by Brase and Brase (2017), 95% confidence intervals (CI) for prevalence rates were calculated using the normal approximation method in the first instance, with the Wilson estimate used if $np \leq 10$ or $n(1 - p) \leq 10$.

5.7.2.3. Research aim two: Determining the recognition and treatment rate of anxiety by residents' GPs and RACF staff. Percentages were calculated to examine the number of participants with a threshold/subthreshold anxiety disorder who had an indication of anxiety on file and were receiving psychotropic medication or psychological treatment.

A secondary objective was to examine whether there was an overall difference in level of cognitive functioning between: (1) participants diagnosed with a threshold/subthreshold anxiety disorder compared to those without a diagnosis; and (2) between participants who were and were not receiving psychotropic medications for the overall sample ($N = 180$), those with a threshold anxiety disorder ($n = 35$), and those with a subthreshold anxiety disorder ($n = 21$). Prior to analysis, data were screened for univariate outliers within each grouping variable. As $N > 80$ ($N = 180$), univariate outliers were defined as cases with a z-score $\geq \pm 4.00$ (Hair, Black, Babin, & Anderson, 2014), with none identified. Normality of MMSE scores for each of the groups was assessed via inspection of histograms and z-scores for skewness and kurtosis; with z-scores ≥ 1.96 indicating significant skew or kurtosis at $p < .05$ (Field, 2009). Using this method, the MMSE scores for the no threshold and no subthreshold anxiety disorder groups were found to have significant kurtosis. Similarly, for the overall sample, significant kurtosis was found for the MMSE scores for those who were and were not receiving an anti-depressant or benzodiazepine, and for the group not receiving an anti-psychotic. Significant skewness was also found for the subthreshold anxiety group receiving a benzodiazepine. Due to this, non-parametric Mann-Whitney U tests were conducted.

5.7.2.4. Research aim three: To identify an appropriate screening instrument to detect anxiety symptoms among older adults in RACFs. First, the

reliability and validity of the GAI, HADS-A, and RAID were determined. Internal consistency for each measure was assessed using Cronbach's alpha. Due to the use of clinical judgement when scoring the RAID, the inter-rater reliability of this measure was assessed using Cohen's Kappa (κ). Visual inspection of histograms and calculation of z-scores for skewness and kurtosis (Field, 2009) revealed the GAI, HADS-A, and RAID all had non-normal, positively skewed distributions, while the HADS-A and RAID were also significantly leptokurtic. Thus, Spearman-rho correlations were conducted between each of the three measures to assess concurrent validity, while Mann-Whitney U tests were conducted to determine whether participants with a GAD diagnosis received significantly higher scores than those without this diagnosis.

To determine the best measure for the detection of anxiety symptoms in RACF residents, Receiver Operating Characteristic (ROC) curves were conducted using the presence/absence of GAD diagnosed using the MINI for DSM-5 as the criterion variable. Using the ROC curves, optimal cut-off scores for and their respective sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) for each of the measures were also determined.

Last, to investigate whether level of cognitive impairment had any impact on the validity of the GAI, RAID, or HADS-A, a separate ROC curve analysis was completed whereby the sample was divided into two groups based on whether participants were considered to have mild cognitive impairment (MMSE score of 18-23) or normal cognitive functioning (MMSE score of 24-30). The ROC curves were then assessed using a statistical method by Hanley and McNeil (1983) to determine if there was a statistically significant difference in AUCs between the GAI, HADS-A, and RAID, and to determine whether there was a significant difference in performance of the scales across cognitive status.

5.7.2.5. Research aim four: To determine the correlates of anxiety among older adults in RACFs. Using the most reliable and valid anxiety measure from research aim three (which was found to be the GAI), the correlates of anxiety symptoms were investigated in two phases. Phase one involved correlational analyses and the completion of Mann-Whitney U and Kruskal-Wallis tests between GAI scores and continuous and categorical variables, respectively. Non-parametric tests were used due to the GAI's significantly positively skewed distribution (with its z-score ≥ 1.96, $p < .05$). This was likely due to the sample being non-clinical, meaning a number of participants scored low on anxiety symptoms. In the second phase, those variables that were found to be significant at $p < .05$ were then entered into a hierarchical multiple linear

regression to examine their independent contribution to anxiety symptoms. The presence of an MDD diagnosis was entered at step 1 due to both its known conceptual overlap with anxiety (Beekman et al., 2000; Schoevers, Beekman, Deeg, Jonker, & Van Tilburg, 2003), and the finding that anxiety can often be a precursor to depression (Wetherell, Gatz, & Pedersen, 2001). All other variables were then entered in a subsequent step to determine if they accounted for any additional variance in self-rated anxiety scores.

With regards to the suitability of the dataset for the completion of a hierarchical multiple regression, inspection of z-scores revealed three univariate outliers for the variable 'length of stay at the RACF', as they exceeded the critical value of ±4.00. As recommended by Field (2009), these were converted to a number that gave rise to a z-score of ±4.00 which allowed them to be retained in the analysis. The presence of multivariate outliers was assessed using Mahalanobis distance, with one case being found to exceed $\chi^2(12) = 32.909$, $p < .001$. Similarly, inspection of standardised residuals revealed one other case to exceed the critical value of ±3.30 (Tabachnick & Fidell, 2007). As outliers can have an undue influence on the model (Field, 2009) and the sample size was still over the absolute minimum case-to-variable ratio suggested by Tabachnick and Fidell (2007), the decision was made to delete these two cases from the analysis. This resulted in a total sample size of 178.

The assumptions of normality, linearity, and homoscedasticity of residuals were assessed via inspection of histograms, normal probability plots, and scatterplots. Visual examination of the histogram and normal probability plot demonstrated slight positive skewness (which was likely due to GAI scores), however the assumption of normally distributed errors for the set of predictor variables was largely met. Inspection of the scatterplot revealed some heteroscedasticity and non-linearity. A square-root transformation was attempted, however this did not substantially improve the statistical model and complicated data interpretation. Thus, the data were not transformed. It is important to note that the violations of these assumptions do not invalidate the analysis so much as weaken its generalisability (Tabachnick & Fidell, 2007). The assumption of independence of errors was met, as evidenced by a Durbin-Watson value = 1.97, which is close to the value of 2.00 and between 1.00 and 3.00 (Field, 2009). Similarly, no multicollinearity was found, with variance inflation factor (VIF) values all below 10 and tolerance values were all above .10 (Hair et al., 2014).

DECLARATION BY CANDIDATE

In the case of Chapter six, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Study conceptualisation, design, data collection, entry, and statistical analyses, and preparation of manuscript.	75

The following co-authors contributed to the work:

Name	Nature of contribution
Dr. Tanya Davison	Provided guidance on the study design and data collection, as well as consultation on the ideas expressed in the manuscript, the reading of drafts and provision of feedback and suggestions.
Professor David Kissane	Provided guidance on the study design and data collection, as well as consultation on the ideas expressed in the manuscript, the reading of drafts and provision of feedback and suggestions.

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work:

Candidate's Signature		Date 15/01/2018

Main Supervisor's Signature		Date 15/01/2018

CHAPTER SIX

THE PREVALENCE, REPORTING, AND TREATMENT OF ANXIETY AMONG OLDER ADULTS IN NURSING HOMES AND OTHER RESIDENTIAL AGED CARE FACILITIES

6.1. PREAMBLE TO EMPIRICAL PAPER ONE

This chapter presents the first of three empirical studies within this thesis. Based on the findings of the systematic review presented in *Chapter two*, it became evident that there was a significant lack of research into the prevalence of anxiety disorders in RACFs. Specifically, all previous identified studies were conducted over 10 years ago, utilised now outdated diagnostic criteria, and experienced a number of methodological limitations. Notably, only one previous study examined the occurrence of anxiety within Australian aged care settings (Cheok et al., 1996), which was completed over 21 years ago. Given the reported high prevalence of anxiety found by the review and the changes in diagnostic criteria and demographic characteristics of RACF residents over the last 10 years, previous prevalence research was considered to be somewhat out of date and had limited generalizability to current populations. Thus, it was considered important to address the gap in our understanding of anxiety within the current cohort of elderly aged care residents by examining the prevalence, recognition and management of this condition within RACFs. The paper presented in this chapter aimed to achieve this.

The following paper has been published by the *Journal of Affective Disorders*; a peer-reviewed journal with an impact factor of 3.432 (ISI Web of Science, 2017). While the tables have been amended to generate a consistent presentation and order within the thesis, the manuscript included in this chapter has been presented in the style of the journal's submission requirements.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2018). The prevalence, reporting, and treatment of anxiety among older adults in nursing homes and other residential aged care facilities. *Journal of Affective Disorders, 227*, 416-423.
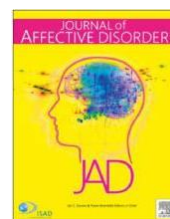
Research paper

The prevalence, reporting, and treatment of anxiety among older adults in nursing homes and other residential aged care facilities

Alexandra S. Creighton[a,b], Tanya E. Davison[b,c], David W. Kissane[b,]

[a] School of Psychological Sciences, Monash University, Clayton, Victoria, Australia
[b] Department of Psychiatry, Monash University, Clayton, Victoria, Australia
[c] Institute for Health & Ageing, Australian Catholic University, Melbourne, Victoria, Australia

A B S T R A C T

Background: Little is known about anxiety in aged care populations, despite its increase in this frail population. This study investigated the prevalence, recording, and treatment rate of anxiety disorders among aged care residents.
Methods: A cross-sectional, observational design was used to assess 180 elderly residents from 12 aged care facilities in Melbourne, Australia. Participants were assessed for threshold and subthreshold anxiety disorders and comorbid depression using the MINI for DSM-5. Medical files were also reviewed to determine whether there was any indication that anxiety had previously been detected, and what treatment those with a threshold/subthreshold diagnosis were receiving.
Results: Overall prevalence of threshold and subthreshold anxiety disorders was 19.4% and 11.7%, respectively. Generalized anxiety disorder was the most common threshold disorder and agoraphobia was the most prevalent subthreshold anxiety disorder. While less than half of those with a threshold or subthreshold anxiety disorder had an indication of anxiety in their file, the majority received psychotropic medication. Cognitive impairment was not significantly associated with the prevalence or treatment of anxiety.
Conclusions: The prevalence of threshold and subthreshold anxiety in aged care settings is high, but remains under-reported by staff and GPs. Facility staff and GPs should ensure they are aware of how anxiety presents in elderly residents and routinely screen for this common mental health issue. This cohort had poor access to psychological treatments for their condition.

1.   Introduction

Anxiety disorders are the most common mental health issue in older adults (≥ 65 years) (Gonçalves et al., 2011; Gum et al., 2009). Despite this, there is limited research into their prevalence in residential aged care facilities (RACFs; also known as nursing homes, hostels, assisted living facilities, or long-term care/residential homes), with a review by Creighton et al. (2015) finding only 10 studies addressing this important topic. These available studies indicated that anxiety disorders are more prevalent in RACFs than in the community; with reports ranging from 3.2% to 20.0% in aged care populations compared to 1.4–17.0% among older adults living in their own homes (Creighton et al., 2015).

However, considerable inconsistency exists across studies in reported prevalence rates for overall and specific anxiety disorders within RACFs, making it difficult to draw firm conclusions. For instance, Junginger et al. (1993) reported the overall prevalence of anxiety disorders according to the Diagnostic and Statistical Manual of Mental Disorders Third Edition, Revised (DSM-III-R; American Psychiatric Association [APA], 1987) to be 20.0% and found generalised anxiety disorder (GAD) to be the most prevalent specific disorder (6.0%). In contrast, Cheok et al.

A.S. Creighton et al.

(1996) reported an overall prevalence of 3.7% and found specific phobia to be the most common (14.0%). Previous studies utilised now outdated diagnostic systems and further research utilising contemporary diagnostic criteria (i.e., the fifth edition of the DSM (APA, 2013)) on the current cohort of older adults is urgently needed. Moreover, many previous studies either excluded specific conditions from their overall estimate (e.g., Cheok et al., 1996) or did not report the prevalence of specific disorders (e.g., Arvaniti et al., 2005; Forsell and Winblad, 1997; Jervis and Manson, 2007; Parmelee et al., 1993). Similarly, most studies did not examine the relationship between anxiety and depression, despite it being found to frequently co-occur in elderly community samples (Braam et al., 2014; Byers et al., 2010). Thus, research clarifying the prevalence of specific and overall anxiety disorders as well as the relationship between anxiety and depression in RACFs is required to address this gap in current literature.

Also problematic is the lack of available studies investigating the prevalence of subthreshold anxiety (i.e., anxiety not meeting full diagnostic criteria). The only published study within an aged care setting located by the authors reported a lower prevalence of subthreshold anxiety disorders than DSM-4 (APA, 1994) threshold disorders (4.2% vs. 5.7%; Smalbrugge et al., 2005b). This is in contrast to higher rates of subthreshold than threshold anxiety reported in community settings (Grenier et al., 2012; Heun et al., 2000) and requires replication, given the substantial negative impact of subthreshold disorders on functioning and quality of life (van Zelst et al., 2006).

Given the paucity of research into prevalence rates within RACFs, it is not surprising that little is known about the recording and treatment of anxiety in this setting. Drageset et al. (2013) found only half of the cognitively-intact RACF residents who reported anxiety symptoms had a diagnosis on file, and less than half of those with a file diagnosis were treated with an anxiolytic. Prior studies into the treatment of anxiety in RACF residents have focused on the use of pharmacological interventions only, with the most commonly used medications being anti-depressants (48%) and anxiolytics (38–97%) (Bourgeois et al., 2012; Selbæk et al., 2007), with no attention paid to documentation of psychological treatments. As late-life anxiety can be effectively treated using psychological as well as pharmacological treatments, particularly if detected and treated early (Barlow and Comer,
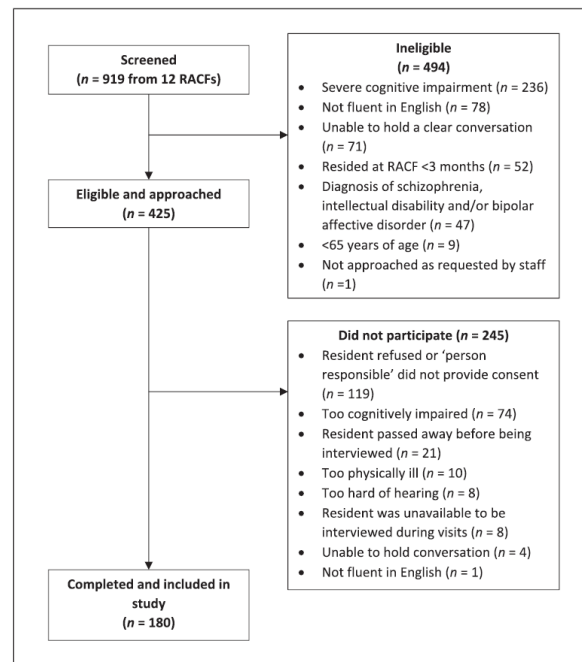
Fig. 6.1. Participant recruitment flowchart.

2013), this gap requires redress. Moreover, with previous research on depression in RACFs finding cognitive impairment impedes detection (Evers et al., 2002) and is associated with slightly lower treatment rates (Davison et al., 2007), an understanding of its impact on the recognition and treatment of anxiety is vital, particularly given that over half of aged care residents have been found to have some level of cognitive impairment (Onder et al., 2012; Selbæk et al., 2007).

To address the abovementioned gaps and limitations, this study aimed to investigate the prevalence of DSM-5 (APA, 2013) threshold/subthreshold anxiety disorders and comorbid depression in a sample of elderly RACF residents with mild cognitive impairment and normal cognitive function. The study also explored the treatment and reporting rates of anxiety by GPs and RACF staff. Not only will this information offer researchers and clinicians with a better understanding of the current cohort of older adults living in aged care, it will also provide better insights into the effectiveness of current aged care practices in detecting and managing this treatable condition.

2. Methods

2.1. Study design

This study utilised an observational, cross-sectional design. Ethics approval was granted by the Monash University Human Research Ethics Committee.

Table 6.1
Criteria for subthreshold anxiety disorders (According to criteria of Angst et al., 1997 and Heun et al., 2000).

Anxiety disorder	Subthreshold criteria
Panic disorder	A subthreshold panic attack (a panic attack with one or more physical symptoms) during the last 4 weeks.
Agoraphobia	Unreasonable fear in places or situations from which it is difficult to leave during the last 4 weeks and at least some avoidance or symptoms of anxiety.
Specific phobia	Persistent fear of circumscribed stimulus during the last 4 weeks and at least some avoidance or consequences.
Social anxiety disorder	Persistent fear of situations in which a person is exposed to social interactions during the last 4 weeks and at least some avoidance or consequences.
GAD	Unrealistic anxiety or worry about two or more life situations during the last 6 months and at least one physical or vegetative symptom, and person finds it distressing.

GAD, Generalised Anxiety Disorder.

2.2. Participants

Utilizing a formula by Daniel (1999) and recommended by Naing et al. (2006), a sample size of 171 participants was determined adequate to estimate population prevalence with 95% confidence. Residents were excluded if they: were<65 years old; resided at the RACF for less than three months; scored<18 on the Mini-Mental State Examination (MMSE); had a diagnosis of schizophrenia or bipolar affective disorder; or were unable to complete clinical assessments because of illness, medication, sensory or speech impairment, intellectual disability, or lack of language fluency.

One-hundred and eighty participants were recruited between March 2015 and November 2016 at a randomly selected group of 12 RACFs within southern and eastern regions of metropolitan Melbourne. Fig. 6.1 provides an overview of participant recruitment with reasons for exclusion or refusal indicated.

2.3. Measurements

2.3.1. Demographic and medical information

Information on participants' age, marital status, date of RACF admission, and current prescribed medications (regular and PRN) were derived from their files held at the facility. Lists of medical diagnoses and behaviour charts kept in each participant's file were also reviewed to determine whether there was any indication of anxiety recorded by facility staff, GPs, or other medical practitioners.

2.3.2. Depression and anxiety

The presence of current major depressive disorder (MDD) and threshold and subthreshold anxiety disorders (panic disorder, social anxiety disorder (SAD), agoraphobia, specific phobia, and generalized anxiety disorder) was determined using the Mini-International Neuropsychiatric Interview version 7.0.0 (MINI; Sheehan et al., 1998). The MINI is a structured clinical interview that generates diagnoses according to DSM-5 (APA, 2013) criteria, and has been widely used in research and clinical settings. While not specifically developed for older adults, this diagnostic measure has been previously used within RACF settings (e.g., Arvaniti et al., 2005; Pachana et al., 2007). Two trained interviewers administered the MINI, with the inter-rater reliability (as measured by Cohen's kappa for a subset of 22 participants) being: 1.0 for panic disorder and agoraphobia, and 0.65 for GAD. Inter-rater reliability for MDD, SAD, and specific phobia could not be computed as no participants in the subsample met criteria for a diagnosis. Training on the use of this measure and continuous supervision was provided throughout the study.

Subthreshold anxiety disorders were defined using criteria developed by Angst et al. (1997) and Heun et al. (2000) (Table 6.1), and extrapolated using information derived from the MINI interview responses. These criteria have also been used in previous research examining anxiety in an aged care population (e.g., Smalbrugge et al., 2005b). Similar to Heun et al. (2000), subthreshold disorders could be diagnosed in participants with other threshold or subthreshold anxiety disorders, but were only diagnosed if the related threshold diagnosis was absent (i.e., subthreshold GAD was only diagnosed in participants who did not meet criteria for threshold GAD).

2.3.3. Cognitive functioning

Cognitive functioning was assessed using the Mini-Mental State Examination (MMSE; Folstein et al., 1975); a commonly used, brief cognitive screening instrument comprising 11-items assessing orientation, memory recall, attention, language, comprehension, and visuospatial skills. The MMSE provides an overall score out of 30, with commonly accepted cut-off points being: 24–30 for

Table 6.2
Demographic and clinical characteristics of the sample (*N* = 180)

Characteristic	*N*	%	Mean	*SD*	Range
Age (years)			85.4	7.4	66–101
Sex					
Male	60	33.3			
Female	120	66.7			
Marital Status					
Never married/single	12	6.7			
Married	34	18.9			
Divorced/separated	36	20.0			
Widowed	96	53.3			
Other	2	1.1			
Years of education			10.8	3.3	1–21
Cognitive functioning (MMSE score)			24.7	3.6	18–30
Length of stay (years)			2.6	2.5	0.2–12.6

SD, standard deviation; *MMSE*, Mini-Mental State Examination.

normal cognition; 18–23 for mild cognitive impairment; and 0–17 for moderate to severe cognitive impairment (Tombaugh and McIntyre, 1992).

2.4. Procedure

Using a random number generator, 19 RACFs were randomly selected from a list of all facilities within southern and eastern metropolitan Melbourne, and invited to participate via phone call and email. Twelve facilities agreed to participate and included private companies, non-for-profit and religious organizations, and government funded facilities. Screening and identification of potential participants was completed with the assistance of the manager and/or director of nursing of each participating facility. Eligible residents were then approached by the first author (AC) and completed a process developed by Warner et al. (2008) to determine their capacity to provide informed consent. If deemed able to provide informed consent, they were invited to participate in the study and sign the consent form. For those considered unable to provide consent themselves, the 'person responsible' was approached to provide written informed consent. The MMSE was then administered, with residents scoring <18 excluded from the study, as well as residents who met other exclusion criteria. All participants were administered the MINI to determine the presence/absence of MDD and

threshold/subthreshold anxiety disorders.

2.5. Statistical analysis

Data was collated and analyzed using the Statistical Package for Social Sciences (SPSS) version 22. Percentages were calculated to estimate the prevalence of MDD, threshold/subthreshold anxiety disorders, and comorbid MDD and anxiety. As recommended by Brase and Brase (2017), 95% confidence intervals (CI) were calculated using the normal approximation method in the first instance, and Wilson estimate if $np \leq 10$ or $n(1-p) \leq 10$. As one participant did not complete the SAD and Specific Phobia subsections of the MINI, the total sample size for these disorders was 179.

For the reporting and treatment of anxiety, percentages were calculated to determine how many of those who met criteria for a threshold/subthreshold anxiety disorder had an indication of anxiety on file and were receiving medication or psychological treatment. As MMSE scores for participants with no threshold/subthreshold anxiety disorders were found to have significant kurtosis (*z*-score of >1.96) (Field, 2009), non-parametric Mann-Whitney U tests were used to determine whether there was a difference in level of cognitive functioning between those diagnosed with a threshold/subthreshold anxiety disorder and those receiving treatment. An alpha of 0.05 was used for all statistical tests.

Table 6.3

Prevalence Rates and 95% Confidence Intervals of Threshold and Subthreshold Anxiety Disorders among Residents of Aged Care Facilities ($n = 180$)

Anxiety disorder	Current threshold disorders		Current subthreshold disorders[a]	
	N	% (95% CI)	N	% (95% CI)
Social anxiety disorder[b]	3	1.7 (0 –5.0)	6	3.3 (1.1 – 7.3)
Panic disorder	3	1.7 (0 – 2.6)	0	0 (0 – 16.2)
Agoraphobia[c]	5	2.8 (1.0 – 6.6)	7	3.9 (1.8 – 8)
Specific phobia[b,d]	11	6.1 (2.6 – 9.6)	5	2.8 (1.0 – 6.6)
GAD	20	11.1 (6.5 – 15.7)	6	3.3 (1.4 – 7.3)
Any anxiety disorder	35	19.4 (13.6 – 25.2)	21	11.7 (7.0 – 16.4)

CI, confidence interval; GAD, Generalised Anxiety Disorder.

[a] A threshold anxiety disorder diagnosis excludes the diagnosis of the same subthreshold disorder.

[b] $N = 179$.

[c] Most commonly cited situations to evoke anxiety symptoms were being in a crowd (threshold: 44.4%; subthreshold: 40.0%), being in an enclosed space (threshold: 33.3%; subthreshold: 30.0%), and being away from home (threshold: 22.2%; subthreshold: 20.0%).

[d] Phobic stimuli included: the natural environment (threshold: 45.5%; subthreshold: 60.0%), animals/insects (threshold: 18.2%; subthreshold: 0%), blood-injection-injury (threshold: 18.2%; subthreshold: 0%), situational factors (threshold: 18.2%; subthreshold: 40.0%).

3. Results

3.1. Study population

Demographic and clinical characteristics of the sample are shown in Table 6.2. The sample comprised 60 males (33.3%) and 120 (66.7%) females, with a mean age of 85.4 years (SD = 7.4). The age distribution and gender ratio of the sample was typical of residents of RACFs in Australia (Australian Institute of Health and Welfare, 2015).

3.2. Prevalence of threshold and subthreshold anxiety disorders

3.2.1. Threshold anxiety disorders

Using the MINI for DSM-5, the overall prevalence rate of any current threshold anxiety disorder was 19.4% (95% CI: 13.6–25.2%);

with 35 participants meeting criteria for one or more disorders (Table 6.3). Most participants met criteria for one threshold disorder (n = 29, 82.9%), five participants (14.3%) met criteria for two, and one participant met criteria for three (panic disorder, agoraphobia, and GAD; 2.9%). GAD was the most prevalent threshold disorder, followed by specific phobia. There was no significant difference in level of cognitive functioning between participants with a threshold anxiety disorder (Mdn = 26.00, Range = 11, $n = 35$) and those without (Mdn = 25.00, Range = 12, $n = 145$), $z = 0.114$, $p = 0.909$.

3.2.2. Subthreshold anxiety disorders

Overall prevalence of any current subthreshold anxiety disorder was 11.7% (95% CI: 7.0 – 16.4%); with 21 participants meeting criteria for one or more disorders. In eight cases

the subthreshold disorder co-occurred with one or more threshold anxiety disorders, while the remaining participants met criteria for one subthreshold disorder only. No significant differences were found in level of cognitive functioning between participants with a subthreshold anxiety disorder (Mdn = 26.00, Range = 11, n = 21) and those without (Mdn = 25.00, Range = 12, n = 159), z = 0.678, p = 0.498.

3.3. Prevalence of MDD and comorbid anxiety and MDD

Fifteen participants met criteria for MDD (8.3%; 95% CI: 4.8–12.3%), with the prevalence of comorbid MDD and any threshold anxiety disorder found to be 6.7% (95% CI: 3–10.4%). Of those with threshold anxiety, 34.3% also received a diagnosis of MDD, with panic disorder the diagnosis with the highest rate of comorbid MDD (100%). Fifty percent of participants with agoraphobia, 43.8% of those with GAD, and 22.2% of those with specific phobia also had a diagnosis of MDD. Only four participants (2.2%) in the total sample had comorbid subthreshold anxiety and MDD.

3.4. Reporting and treatment of anxiety

3.4.1. Reporting of any threshold/subthreshold anxiety disorder

Less than half of participants with a threshold or subthreshold anxiety disorder had any indication of anxiety on file (i.e., the terms 'anxiety', 'anxiety disorder', 'anxious' were included in the list of medical conditions or on behavioural charts) (Table 6.4).

3.4.2. Treatment of any threshold/subthreshold anxiety disorder

Of the 56 participants with a threshold or subthreshold anxiety disorder, more than half were receiving a treatment that was potentially prescribed for anxiety (see Table 6.4). Similar treatment rates were found for threshold and subthreshold conditions. Psychological treatment had been provided to 8.6% of participants with a threshold anxiety disorder but to no participants with a subthreshold diagnosis.

Mann-Whitney tests revealed no significant differences in cognitive function between participants who were and were not receiving antidepressants within the overall sample (p = 0.311), and for those with a threshold (p = 0.123) or subthreshold disorder (p = 1.000). Similarly, no significant differences in cognition were found between those who were and were not receiving benzodiazepines (overall sample: p = 0.895; those with a threshold anxiety disorder: p = 0.606; those with a subthreshold anxiety disorder: p = 0.310) or antipsychotics (overall sample: p = 0.427; those with a threshold anxiety disorder: p = 0.612; those with a subthreshold anxiety disorder: p = 0.857).

3.4.3. Reporting of anxiety in participants with a specific threshold/subthreshold anxiety disorder

All participants with threshold panic disorder and agoraphobia had an indication of anxiety on file, as did the majority of participants with threshold SAD (Table 6.5). Less than half with threshold GAD and only 18.2% with threshold specific phobia had any record of anxiety. Participants with subthreshold GAD and specific phobia had the highest rates of anxiety recorded in their file. Half the participants with subthreshold SAD and none with subthreshold agoraphobia had an indication of anxiety noted.

3.4.4. Treatment of anxiety in participants with a specific threshold/subthreshold anxiety disorder

As shown in Table 6.5, the most common treatment for participants with specific threshold anxiety disorders were benzodiazepines; with 100% of participants with panic disorder and SAD, 80.0% of those with agoraphobia, and 65.0% of those with GAD prescribed this medication. Anti-depressants were also commonly prescribed. Antipsychotics were uncommonly prescribed. Participants with threshold specific phobia were the least likely to have received treatment.

At least half of the participants with a threshold anxiety disorder received a combination of anti-depressants and benzodiazepines; with this being the case for threshold SAD, agoraphobia, and GAD. Participants with threshold panic disorder or specific phobia were typically prescribed a benzodiazepine only. Participants with a subthreshold anxiety disorder who were receiving treatment were also typically prescribed a combination of anti-depressants and benzodiazepines.

4. Discussion

To the authors' knowledge, this study is the first in 10 years to examine the prevalence of anxiety disorders and comorbid MDD in RACFs, and only the second published study to determine the reporting and treatment rates of

Table 6.4

Diagnosis of any DSM-5 threshold/subthreshold anxiety disorder, indication of anxiety on file and treatment of anxious participants.

Cognitive function	Diagnosis of anxiety disorder	Anxiety recorded on medical file	Receiving an anti-depressant medication	Receiving a benzodiazepine (regular or PRN)	Receiving an antipsychotic (regular or PRN)	Receiving psychological treatment	Receiving no treatment
Threshold anxiety disorders							
Normal	22/115	8/22	15/22	12/22	2/22	2/22	6/22
(MMSE = ≥ 24)	(19.1%)	(36.4%)	(68.2%)	(54.5%)	(9.1%)	(9.1%)	(27.3%)
Mild impairment	13/65	6/13	5/13	9/13	0/13	1/13	2/13
(MMSE = 18–23)	(20.0%)	(46.2%)	(38.5%)	(69.2%)	(0%)	(7.7%)	(15.4%)
Total	35/180	14/35	20/35	21/35	2/35	3/35	8/35
	(19.4%)	(40.0%)	(57.1%)	(60.0%)	(5.7%)	(8.6%)	(22.9%)
Subthreshold anxiety disorders							
Normal	15/115	6/15	10/15	9/15	1/15	0/15	3/15
(MMSE = ≥ 24)	(13%)	(40.0%)	(66.7%)	(60.0%)	(6.7%)	(0%)	(20.0%)
Mild impairment	6/65	2/6	3/6	3/6	0/6	0/6	1/6
(MMSE = 18–23)	(9.2%)	(33.3%)	(50.0%)	(50.0%)	(0%)	(0%)	(16.7%)
Total	21/180	8/21	13/21	12/21	1/21	0/21	4/21
	(11.7%)	(38.1%)	(61.9%)	(57.1%)	(4.8%)	(0%)	(19.0%)

PRN, pro re nata or 'as needed'; *MMSE* = Mini-Mental State Examination.

Table 6.5

Diagnosis of specific DSM-5 threshold/subthreshold anxiety disorder, indication of anxiety on file and treatment of anxious participants.

Anxiety disorder	Anxiety recorded on medical file	Receiving an anti-depressant medication	Receiving a benzodiazepine (regular or PRN)	Receiving an antipsychotic (regular or PRN)	Receiving psychological treatment	Receiving no treatment
Threshold anxiety disorders						
Panic disorder	3/3	1/3	3/3	0/3	0/3	0/3
	(100%)	(33.3%)	(100%)	(0%)	(0%)	(0%)
Social anxiety disorder	2/3	2/3	3/3	0/3	0/3	0/3
	(66.7%)	(66.7%)	(100%)	(0%)	(0%)	(0%)
Agoraphobia	5/5	4/5	4/5	1/5	1/5	1/5
	(100%)	(80.0%)	(80.0%)	(20.0%)	(20.0%)	(20.0%)
Specific phobia	2/11	5/11	5/11	0/11	1/11	3/11
	(18.2%)	(45.5%)	(45.5%)	(0%)	(9.1%)	(27.3%)
GAD	8/20	13/20	13/20	1/20	2/20	4/20
	(40.0%)	(65.0%)	(65.0%)	(5.0%)	(10.0%)	(20.0%)
Subthreshold anxiety disorders						
Social anxiety disorder	3/6	4/6	4/6	1/6	0/6	1/6
	(50.0%)	(66.7%)	(66.7%)	(16.7%)	(0%)	(16.7%)
Agoraphobia	0/7	5/7	3/7	0/7	0/7	1/7
	(0%)	(71.4%)	(42.9%)	(0%)	(0%)	(14.3%)
Specific phobia	3/5	4/5	4/5	1/5	0/5	1/5
	(60.0%)	(80.0%)	(80.0%)	(20.0%)	(0%)	(20.0%)
GAD	4/6	3/6	4/6	1/6	0/6	1/6
	(66.7%)	(50.0%)	(66.7%)	(16.7%)	(0%)	(16.7%)

Note. Subthreshold panic disorder was not included in the table as no participants met criteria for this diagnosis.
PRN, pro re nata or 'as needed'; *GAD*, Generalised Anxiety Disorder.

anxiety by GPs, other medical practitioners, and facility staff.

4.1. The prevalence of overall and specific threshold/subthreshold anxiety disorders

Overall, 26.7% of the sample met criteria for a threshold or subthreshold anxiety disorder. There was a high overall prevalence of threshold anxiety disorders, with 19.4% meeting DSM-5 (APA, 2013) criteria. This falls into the upper range of prevalence estimates reported by previous RACF studies; where rates were between 3.2–20.0% (Arvaniti et al., 2005; Forsell and Winblad, 1997; Junginger et al., 1993; Smalbrugge et al. 2005b). Compared to population-based studies (where prevalence estimates range between 1.4–17.0% (Creighton et al., 2015)), the current study provides further evidence that older adults living in residential care are more prone to experience anxiety, indicating that the condition remains a widespread and significant issue within this setting.

In agreement with previous late-life research (Bryant et al., 2008; Krasucki et al., 1999), threshold GAD (11.1%) and specific phobia (6.1%) were the two most common anxiety

disorders. Again, rates of both disorders in the current RACF sample were in the upper range or higher than previous (Bland et al., 1988; Cheok et al., 1996; Class et al., 1996; Junginger et al., 1993; Smalbrugge et al., 2005). The prevalence of GAD was also higher than that found in community-dwelling elderly samples (Beekman et al., 1998; Byers et al., 2010). As chronic physical illnesses and functional limitations have been found to be significantly associated with GAD (Beekman et al., 1998; Van Balkom et al., 2000), the higher rate of this disorder within the current aged care sample may be explained by the fact that this population is typically more frail, functionally dependent, and medically complex than their community-dwelling counterparts (Australian Institute of Health and Welfare, 2015).

Agoraphobia (2.7%), SAD (1.7%), and panic disorder (1.7%) were found to be relatively uncommon, which is consistent with the limited previous research in RACFs (Cheok et al., 1996; Jervis and Manson, 2007; Smalbrugge et al., 2005b). Similar estimates have been found within community elderly samples (e.g., Beekman et al., 1998; Kirmizioglu et al., 2009). Given that older adults (particularly RACF residents) often have fewer obligations and are typically more restricted in their daily activities (De Bellis, 2010), it may be that they find it easier to avoid activities and situations that evoke the fear and anxiety associated with these disorders.

Unlike previous studies on community elderly samples (Grenier et al., 2011; Heun et al., 2000), the current study found subthreshold anxiety disorders to be less prevalent (11.7%) than threshold disorders. Nonetheless, a substantial proportion of the sample met criteria for subthreshold anxiety disorders, with agoraphobia (3.9%), GAD (3.3%), and SAD (3.3%) being the most common.

The prevalence rates found in the current sample appear to be higher than those in prior research. It should be noted that most previous RACF studies utilised hierarchical rules or did not include all anxiety disorders in their overall prevalence (e.g., Bland et al., 1988; Cheok et al., 1996), and therefore may have underestimated the true prevalence of anxiety. Moreover, as previous studies on anxiety in RACFs were conducted over 10 years ago, it is possible that the higher prevalence estimations found in the current study are due to cohort or cultural differences regarding the acceptability of disclosing symptoms. Thus, it may be that this study's findings are a more accurate reflection of the true prevalence of anxiety within the current RACF population.

Another explanation for higher estimations could be the current study's use of DSM-5 (APA, 2013) and the MINI. Several important changes were made to anxiety disorder criteria in DSM-5; with a broadening of feared consequences in SAD and removal of the requirement for individuals to recognize their anxiety is excessive or unreasonable for a diagnosis of SAD, agoraphobia, and specific phobia (APA, 2013). As older adults with anxiety often have poor insight into their symptoms and frequently misattribute them to medical etiology (Lenze and Wetherell, 2011), a number may not have met criteria using previous versions of the DSM. Moreover, the MINI was designed to be slightly over-inclusive to decrease the chances of false negatives (Sheehan et al., 1997, 1998) and so may have contributed to higher prevalence rates.

4.2. Threshold/subthreshold anxiety disorders and cognitive impairment

Previous research reported mixed findings on the relationship between cognitive impairment and anxiety (Cheok et al., 1996; Smalbrugge et al., 2005b). In this study, mild cognitive impairment was not found to be significantly associated with the presence of threshold or subthreshold anxiety disorders, which is consistent with research by Cheok et al. (1996) and Neville and Teri (2011). Some research has found higher levels of cognitive functioning to be significantly associated with anxiety (Smalbrugge et al., 2005b) while others have reported higher rates of anxiety among those with lower cognitive functioning (Parmelee et al., 1993; Zuidema et al., 2009). Given that more than half of the RACF population has dementia (AIHW, 2015), further research is needed to clarify the precise relationship between anxiety and cognitive functioning among RACF residents.

4.3. Comorbid anxiety and MDD

Overall, comorbid threshold anxiety and MDD was found in 6.7% of the sample. Thirty-four percent of participants with a threshold anxiety disorder and 19.0% with subthreshold anxiety had comorbid MDD, which is consistent with previous research in both RACF (Parmelee et al., 1993; Smalbrugge et al., 2005a) and community samples (Beekman et al., 1998; Schoevers et al., 2003). Given that anxiety typically precedes depression (Wetherell et al., 2001), the high rates of comorbidity in residents with anxiety is not

surprising and suggests the lower comorbidity rate found with subthreshold anxiety disorders may be because the anxiety and its consequences are not yet severe enough to evoke depressive symptoms. Further RACF research (particularly longitudinal studies) is needed to clarify the prevalence of comorbid threshold/subthreshold anxiety and depression in this population and determine the direction of their relationship.

4.4. Recording and treatment of anxiety

Less than half the participants with a threshold or subthreshold anxiety disorder had any indication of anxiety on file, suggesting that the condition is significantly under-reported. This is in contrast to treatment rates, with the majority found to have been prescribed an anti-depressant and/or benzodiazepine. For the majority of participants the authors were unable to identify whether their medications were used to treat anxiety or some other condition (e.g., depression, agitation). However, given the significant under-reporting of anxiety in this study, it may be that the medication was not primarily prescribed to treat participants' anxiety in some instances. Therefore, this study may have overestimated the true treatment rate of anxiety.

Another explanation for the under-reporting of anxiety in the context of high prescription rates may be that GPs are prescribing medications for anxiety symptoms, but failing to record their detection in residents' files. This may be because GPs perceive anxiety to be a normal part of ageing and/or response to residing in RACFs, and subsequently believe no formal diagnosis or record on file is needed. Previous studies examining the treatment and detection of depression in RACFs have reported similar findings (Cohen et al., 2003; Gruber-Baldini et al., 2005; Lustenberger et al., 2011), suggesting that under-diagnosis and reporting of psychiatric conditions in aged care residents is common. This suggests a valid screening measure and specialised training in the recognition of anxiety for RACF nursing staff may be beneficial.

This study confirms previous findings that psychotropic medication and polypharmacy is typically used as first line treatment for mental health concerns in RACF residents (Davison et al., 2007, 2012), despite the potential adverse side-effects observed in frail older adults (Hajjar et al., 2007). Reasons for overdependence on pharmacological approaches may include a perceived negative social stigma associated with seeking

psychological support, lack of staff awareness of mental health, inadequate funding, and poor access to psychological care providers (Davison et al., 2016). However, with growing evidence for the effectiveness of psychological intervention in treating anxiety and depression in elderly residents (Wells et al., 2014), RACF staff and GPs should be educated on the potential benefits of psychotherapy for this population.

Agoraphobia and panic disorder were the most commonly detected and treated specific threshold anxiety disorders. One reason for this may be that the symptoms associated with these disorders are overt and behaviourally-based (i.e., panic attacks, avoidance of specific situations), meaning that staff are more likely to notice them and their impact on functioning. Panic disorder appeared to be most commonly treated with benzodiazepines (100.0%), which is consistent with previous research (Van Balkom et al., 2000). Threshold specific phobia appeared to be the least commonly detected and treated disorder, possible due to the limited impact of symptoms on residents' daily life.

Although participants with normal cognition appeared to have slightly higher treatment rates, no significant difference was found in the treatment of anxiety between residents with normal cognitive function and mild impairment. This finding is similar to a previous study examining treatment rates of depression in RACFs (Davison et al., 2007), however the current study experienced the same methodological limitations of a small sample size and exclusion of residents with higher levels of cognitive impairment. Further studies with a larger sample size that includes residents with moderate/severe cognitive deficits are needed.

4.5. Study limitations

There are a number of limitations to this study. First, a cross-sectional design was used, which limits the interpretation of findings as causal inferences cannot be made between anxiety and cognition. Second, given that participation was voluntary and those with significant cognitive impairment were excluded, the sample may suffer from selection bias and limit generalizability of findings. Third, while the sample size was likely adequate to detect prevalence of overall anxiety, the final sample was a small proportion of the total population available. Moreover, the small cell sizes and large confidence intervals for specific anxiety disorders means findings for prevalence, reporting, and treatment must

be interpreted with caution. Lastly, the current study did not assess for separation anxiety disorder, selective mutism, substance/medication-induced anxiety disorder, or anxiety disorder due to another medical condition. As well as being mindful not to overburden participants with questions, separation anxiety and selective mutism were not considered vital given they seldom persist into adulthood (Garcia et al., 2004; Shear et al., 2006), while substance/medication-induced anxiety disorder or anxiety disorder due to another medical condition were not assessed by the MINI for DSM-5. The exclusion of these disorders may have resulted in an underestimation of the prevalence of anxiety disorders within this setting.

5. Conclusions

Although, due to variable prevalence estimates across studies the true prevalence of specific anxiety disorders among RACF residents remains uncertain, this study confirms the high rate of anxiety among this frail and growing population. Despite this, anxiety appears to remain largely under-reported and undertreated with psychological therapies. From a clinical perspective, this highlights the need for an increase in overall awareness of both anxiety and the range of effective treatment options among GPs and RACF staff, and suggests the identification and use of a valid screening measure may aid in detection and therefore improved outcomes for residents. Thus, as well as examining the prevalence of threshold/subthreshold anxiety in aged care through the use of a prospective design and inclusion of residents with more severe cognitive impairment, research identifying a reliable, valid, and easy to use screening measure for anxiety among RACF residents would be beneficial.

Acknowledgements

Role of Funding

References

American Psychiatric Association, 1987. Diagnostic and Statistical Manual of Mental Disorders, 3rd ed., revised ed. American Psychiatric Association, Washington, DC.

American Psychiatric Association, 1994. Diagnostic and Statistical Manual of Mental Disorders, 4th ed. American Psychiatric Association, Washington, DC.

American Psychiatric Association, 2013. Diagnostic and Statistical Manual of Mental Disorders, 5th ed. American Psychiatric Association, Washington, DC.

Angst, J., Merikangas, K.R., Preisig, M., 1997. Subthreshold syndromes of depression and anxiety in the community. J. Clin. Psychiatry 58 (Suppl 8), S6–S10.

Arvaniti, A., Livaditis, M., Kanioti, E., Davis, E., Samakouri, M., Xenitidis, K., 2005. Mental health problems in the elderly in residential care in Greece – a pilot study. Aging Ment. Health 9 (2), 142–145. http://dx.doi.org/10.1080/13607860412331336869.

Australian Institute of Health and Welfare, 2015. Residential Aged Care and Home Care 2014-15. Australian Institute of Health and Welfare, Canberra.

Barlow, D.H., Comer, J.S., 2013. What are the optimal treatment courses for geriatric anxiety, and how do we find out? Am. J. Psychiatry 170 (7), 707–711. http://dx.doi.org/10.1176/appi.ajp.2013.13040513.

Beekman, A.T.F., Bremmer, M.A., Deeg, D.J.H., Van Balkom, A.J.L.M., Smit, J.H., De Beurs, E., Van Tilburg, W., 1998. Anxiety disorders in later life: a report from the longitudinal aging study Amsterdam. Int. J. Geriatr. Psychiatry 13 (10), 717–726. http://dx.doi.org/10.1002/(SICI)10991166(1998100)13:10<717::AID-GPS857>3.0.CO;2-M.

Bland, R.C., Newman, S.C., Orn, H., 1988. Prevalence of psychiatric disorders in the elderly in Edmonton. Acta Psychiatr. Scand. 77 (Suppl. 338), S57–S63.

Bourgeois, J., Elseviers, M.M., Azermai, M., Van Bortel, L., Petrovic, M., Vander Stichele, R.R., 2012. Benzodiazepine use in Belgian nursing homes: a closer look into indications and dosages. Eur. J. Clin. Pharmacol. 68 (5), 833–844. http://dx.doi.org/10.1007/s00228-011-1188-z.

Braam, A.W., Copeland, J.R.M., Delespaul, P.A.E.G., Beekman, A.T.F., Como, A., Dewey, M., Skoog, I., 2014. Depression, subthreshold depression and comorbid anxiety symptoms in older Europeans: results from the EURODEP concerted action. J. Affect. Disord. 155 (1), 266–272. http://dx.doi.org/10.1016/j.jad.2013.11.011

Brase, C.H., Brase, C.P., 2017. Understandable Statistics: Concepts and Methods, 12th ed. Cengage Learning, Inc, Mason, OH.

Bryant, C., Jackson, H., Ames, D., 2008. The

prevalence of anxiety in older adults: methodological issues and a review of the literature. J. Affect. Disord. 109 (3), 233–250. http://dx.doi.org/10.1016/j.jad.2007.11.008.

Byers, A.L., Yaffe, K., Covinsky, K.E., Friedman, M.B., Bruce, M.L., 2010. High occurrence of mood and anxiety disorders among older adults: the national comorbidity survey replication. Arch. General. Psychiatry 67 (5), 489–496. http://dx.doi.org/10.1001/archgenpsychiatry.2010.35.

Cheok, A., Snowdon, J., Miller, R., Vaughan, R., 1996. Prevalence of anxiety disorders in nursing homes. Int. J. Geriatr. Psychiatry 11 (5), 405–410. http://dx.doi.org/10.1002/(SICI)1099-1166(199605)11:5<405::AID-GPS302>3.0.CO;2-O.

Class, C.A., Unverzagt, F.W., Gao, S., Hall, K.S., Baiyewu, O., Hendrie, H.C., 1996. Psychiatric disorders in African American nursing home residents. Am. J. Psychiatry 153 (5), 677–681.

Cohen, C.I., Hyland, K., Kimhy, D., 2003. The utility of mandatory depression screening of dementia patients in nursing homes. Am. J. Psychiatry 160 (11), 2012–2017. http://dx.doi.org/10.1176/appi.ajp.160.11.2012

Creighton, A.S., Davison, T.E., Kissane, D.W., 2015. The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. Int. J. Geriatr. Psychiatry 31 (6), 555–566. http://dx.doi.org/10.1002/gps.4378.

Daniel, W.W., 1999. Biostatistics: A Foundation for Analysis in the Health Sciences, 7th ed. John Wiley & Sons, New York, NY.

Davison, T.E., Koder, D., Helmes, E., Doyle, C., Bhar, S., Mitchell, L., Pachana, N., 2016. Brief on the role of psychologists in residential and home care services for older adults. Aust. Psychol. http://dx.doi.org/10.1111/ap.12209. (n/a-n/a).

Davison, T.E., McCabe, M.P., Mellor, D., Ski, C., George, K., Moore, K.A., 2007. The prevalence and recognition of major depression among low-level aged care residents with and without cognitive impairment. Aging Ment. Health 11 (1), 82–88. http://dx.doi.org/10.1080/13607860600736109.

Davison, T.E., Snowdon, J., Castle, N., McCabe, M.P., Mellor, D., Karantzas, G., Allan, J., 2012. An evaluation of a national program to implement the cornell scale for depression in dementia into routine practice in aged care facilities. Int. Psychogeriatr. 24 (4), 631–641.

De Bellis, A., 2010. Australian residential aged care and the quality of nursing care provision. Contemporary Nurse 35 (1), 100–113. http://dx.doi.org/10.5172/conu.2010.35.1.100.

Drageset, J., Eide, G.E., Ranhoff, A.H., 2013. Anxiety and depression among nursing home residents without cognitive impairment. Scand. J. Caring Sci. 27 (4), 872–881. http://dx.doi.org/10.1111/j.1471-6712.2012.01095.x.

Evers, M.M., Samuels, S.C., Lantz, M.S., Khan, K.,

Brickman, A.M., Marin, D.B., 2002. The prevalence, diagnosis and treatment of depression in dementia patients in chronic care facilities in the last six months of life. Int. J. Geriatr. Psychiatry 17 (5), 464–472. http://dx.doi.org/10.1002/gps.634.

Field, A., 2009. Discovering Statistics Using SPSS, 3rd ed. SAGE Publications, London, UK.

Folstein, M.F., Folstein, S.E., McHugh, P.R., 1975. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J. Psychiatr. Res. 12 (3), 189–198.

Forsell, Y., Winblad, B., 1997. Anxiety disorders in non-demented and demented elderly patients: prevalence and correlates. J. Neurol. Neurosurg. Psychiatry 62 (3), 294–295.

Garcia, A., Freeman, J., Francis, G., Miller, L.M., Leonard, H.L., 2004. Selective mutism. In: Ollendick, T. (Ed.), Phobic and Anxiety Disorders in Children and Adolescents: A Clinician's Guide to Effective Psychosocial and Pharmacological Interventions. Oxford University Press, London, UK, pp. 433–455.

Gonçalves, D.C., Pachana, N.A., Byrne, G.J., 2011. Prevalence and correlates of generalized anxiety disorder among older adults in the Australian national survey of mental health and well-being. J. Affect. Disord. 132 (1–2), 223–230. http://dx.doi.org/10.1016/j.jad.2011.02.023

Grenier, S., Potvin, O., Hudon, C., Boyer, R., Préville, M., Desjardins, L., Bherer, L., 2012. Twelve-month prevalence and correlates of subthreshold and threshold anxiety in community-dwelling older adults with cardiovascular diseases. J. Affect. Disord. 136 (3), 724–732. http://dx.doi.org/10.1016/j.jad.2011.09.052

Grenier, S., Préville, M., Boyer, R., O'Connor, K., Béland, S.G., Potvin, O., Brassard, J., 2011. The impact of DSM-IV symptom and clinical significance criteria on the prevalence estimates of subthreshold and threshold anxiety in the older adult population. Am. J. Geriatr. Psychiatry 19 (4), 316–326. http://dx.doi.org/10.1097/JGP.0b013e3181ff416c.

Gruber-Baldini, A.L., Zimmerman, S., Boustani, M., Watson, L.C., Williams, C.S., Reed, P.S., 2005. Characteristics associated with depression in long-term care residents with dementia. Gerontologist 45 (Suppl_1), S50–S55. http://dx.doi.org/10.1093/geront/45.suppl_1.50.

Gum, A.M., King-Kallimanis, B., Kohn, R., 2009. Prevalence of mood, anxiety, and substance-abuse disorders for older Americans in the national comorbidity survey-replication. Am. J. Geriatr. Psychiatry 17 (9), 769–781. http://dx.doi.org/10.1097/JGP.0b013e3181ad4f5a.

Hajjar, E.R., Cafiero, A.C., Hanlon, J.T. 2007. Polypharmacy in elderly patients. Am. J. Geriatr. Pharmacother. 5 (4), 345–351. http://dx.doi.org/10.1016/j.amjopharm.2007.12.002.

Heun, R., Papassotiropoulos, A., Ptok, U., 2000.

Subthreshold depressive and anxiety disorders in the elderly. Eur. Psychiatry 15 (3), 173–182. http://dx.doi.org/10.1016/S09249338(00)00228 -5.

Jervis, L.L., Manson, S.M., 2007. Cognitive impairment, psychiatric disorders, and problematic behaviors in a tribal nursing home. J. Aging Health 19 (2), 260–274. http://dx.doi.org/10.1177/0898264306297191

Junginger, J., Phelan, E., Cherry, K., Levy, J., 1993. Prevalence of psychopathology in elderly persons in nursing homes and in the community. Hosp. Community Psychiatry 44 (4), 381–383.

Kirmizioglu, Y., Doğan, O., Kuğu, N., Akyüz, G., 2009. Prevalence of anxiety disorders among elderly people. Int. J. Geriatr. Psychiatry 24 (9), 1026–1033. http://dx.doi.org/10.1002/gps.2215

Krasucki, C., Howard, R., Mann, A., 1999. Anxiety and its treatment in the elderly. Int. Psychogeriatr. 11 (1), 25–45.

Lenze, E.J., Wetherell, J.L., 2011. A lifespan view of anxiety disorders. Dialog. Clin. Neurosci. 13 (4), 381–399.

Lustenberger, I., Schüpbach, B., Von Gunten, A., Mosimann, U.P., 2011. Psychotropic medication use in Swiss nursing homes. Swiss Med. Wkly. 141 (October). http://dx.doi.org/10.4414/smw.2011.13254

Naing, L., Winn, T., Rusli, B.N., 2006. Practical issues in calculating the sample size for prevalence studies. Arch. Orofac. Sci. 1 (1), 9– 14.

Neville, C., Teri, L., 2011. Anxiety, anxiety symptoms, and associations among older people with dementia in assisted-living facilities. . Int. J. Ment. Health Nurs. 20 (3), 195–201. http://dx.doi.org/10.1111/j.1447-0349.2010.00724.x.

Onder, G., Carpenter, I., Finne-Soveri, H., Gindin, J., Frijters, D., Henrard, J.C., Bernabei, R., 2012. Assessment of nursing home residents in Europe: the services and health for elderly in long TERm care (SHELTER) study. BMC Health Serv. Res. 12 (5), 1–10. http://dx.doi.org/10.1186/1472-6963-12-5.

Pachana, N.A., Byrne, G.J., Siddle, H., Koloski, N., Harley, E., Arnold, E., 2007. Development and validation of the geriatric anxiety inventory. Int. Psychogeriatr. 19 (1), 103–114. http://dx.doi.org/10.1017/S1041610206003504

Parmelee, P.A., Katz, I.R., Lawton, M.P., 1993. Anxiety and its association with depression among institutionalized elderly. Am. J. Geriatr. Psychiatry 1 (1), 46–58.

Schoevers, R.A., Beekman, A.T.F., Deeg, D.J.H., Jonker, C., Van Tilburg, W., 2003. Comorbidity and risk-patterns of depression, generalised anxiety disorder and mixed anxiety-depression in later life: results from the AMSTEL study. Int. J. Geriatr. Psychiatry 18 (11), 994–1001. http://dx.doi.org/10.1002/gps.1001.

Selbæk, G., Kirkevold, Ø., Engedal, K., 2007. The prevalence of psychiatric symptoms and behavioural disturbances and the use of psychotropic drugs in Norwegian nursing

homes. Int. J. Geriatr. Psychiatry 22 (9), 843–849. http://dx.doi.org/10.1002/gps.1749.

Shear, K., Jin, R., Ruscio, A.M., Walters, E.E., Kessler, R.C., 2006. Prevalence and correlates of estimated DSM-IV child and adult separation anxiety diorder in the national comorbidity survey replication (NCS-R). Am. J. Psychiatry 163 (6), 1074–1083. http://dx.doi.org/10.1176/appi.ajp.163.6.1074.

Sheehan, D.V., Lecrubier, Y., Harnett-Sheehan, K., Janavs, J., Weiller, E., Keskiner, A., Dunbar, G.C., 1997. The validity of the mini international neuropsychiatric interview (MINI) according to the SCID-P and its reliability. Eur. Psychiatry 12 (5), 232–241.

Sheehan, D.V., Lecrubier, Y., Sheehan, K.H., Amorim, P., Janavs, J., Weiller, E., Dunbar, G.C., 1998. The mini-international neuropsychiatric interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-1. J. Clin. Psychiatry 59 (Suppl. 20), 22–33.

Smalbrugge, M., Jongenelis, L., Pot, A.M., Beekman, A.T.F., Eefsting, J.A., 2005a. Comorbidity of depression and anxiety in nursing home patients. Int. J. Geriatr. Psychiatry 20 (3), 218–226. http://dx.doi.org/10.1002/gps.1269.

Smalbrugge, M., Pot, A.M., Jongenelis, K., Beekman, A.T.F., Eefsting, J.A., 2005b. Prevalence and correlates of anxiety among nursing home patients. J. Affect. Disord. 88 (2), 145–153. http://dx.doi.org/10.1016/j.jad.2005.06.006

Tombaugh, T.N., McIntyre, N.J., 1992. The mini-mental state examination: a comprehensive review. J. Am. Geriatr. Soc. 40 (9), 922–935.

Van Balkom, A.J.L.M., Beekman, A.T.F., De Beurs, E., Deeg, D.J.H., Van Dyck, R., Van Tilburg, W., 2000. Comorbidity of the anxiety disorders in a community-based older population in the Netherlands. Acta Psychiatr. Scand. 101 (1), 37–45. http://dx.doi.org/10.1034/j.1600-0447.2000.101001037.x.

van Zelst, W.H., De Beurs, E., Beekman, A., van Dyck, R., Deeg, D., 2006. Well-being, physical functioning, and use of health services in the elderly with PTSD and subthreshold PTSD. Int. J. Geriatr. Psychiatry 21 (2), 180–188. http://dx.doi.org/10.1002/gps.1448.

Warner, J., McCarney, R., Griffin, M., Hill, K., Fisher, P., 2008. Participation in dementia research: rates and correlates of capacity to give informed consent. J. Med. Ethics 34 (3), 167–170. http://dx.doi.org/10.1136/jme.2006.019786

Wells, Y., Bhar, S., Kinsella, G., Kowalski, C., Merkes, M., Patchett, A., …van Holsteyn, J., 2014. What Woks to Promote Emotional Wellbeing in Older People: A Guide for Aged Care Staff Working in Community Or Residential Care Settings. Melbourne: Beyondblue.

Wetherell, J.L., Gatz, M., Pedersen, N.L., 2001. A longitudinal analysis of anxiety and depressive

symptoms. Psychol. Aging 16 (2), 187–195. http://dx.doi.org/10.1037//0882-7974.16.2.187.

Zuidema, S.U., De Jonghe, J.F.M., Verhey, F.R.J., Koopmans, R.T.C.M., 2009. Predictors of neuropsychiatric symptoms in nursing home patients: influence of gender and dementia severity. Int. J. Geriatr. Psychiatry 24 (10), 1079–1086. http://dx.doi.org/10.1002/gps.2225.

6.3.   SUMMARY AND CONCLUSION

In this chapter, a paper was presented that examined the prevalence, recognition, and management rates of anxiety among elderly RACF residents. Consistent with the findings of the review presented in *Chapter two*, the prevalence of any threshold or subthreshold anxiety disorder was found to be high (19.4% and 11.7%, respectively), with GAD and specific phobia the most common specific threshold disorders within the sample, and agoraphobia being the most common subthreshold disorder. Thirty-seven percent of residents with a threshold anxiety disorder and 19.0% with a subthreshold disorder were also found to have comorbid MDD. These results indicate that anxiety remains a common and widespread issue within aged care settings, with a number of residents also experiencing comorbid depression.

Despite the high prevalence of anxiety within the sample, it was found to be significantly under-reported by residents' GPs and RACF staff; with less than half of the participants with a threshold or subthreshold anxiety disorder having an indication of anxiety on file. Yet, the majority were found to have been receiving psychotropic medication, with many receiving an anti-depressant and/or benzodiazepine. While this may suggest anxiety is being well managed within aged care settings, for most participants we were unable to identify whether their medications were used to treat anxiety or some other (typically more well-known) condition (e.g., depression, agitation). Given the significant under-reporting of anxiety, it is likely that the medication was not primarily prescribed to treat participants' anxiety in many cases.

No significant relationship was found between the presence of threshold or subthreshold anxiety disorders and MCI (as assessed by the MMSE), and similarly, no significant difference was found in the treatment of anxiety between residents with normal cognitive function and mild impairment. Although this suggests cognition has no association with the presence or treatment of anxiety in RACF residents (which is consistent with previous aged care research (e.g., Cheok et al., 1996; Davison et al., 2007; Neville & Teri, 2011)) as discussed in *Chapter nine*, this finding may have been influenced by the exclusion of residents with more severe levels of cognitive impairment.

Overall, the study highlights the high prevalence but low detection rate of anxiety among aged care residents, suggesting that a valid screening measure of anxiety symptoms in aged care residents may be highly beneficial. In the next chapter, a paper is presented that examined the reliability, validity, sensitivity, and specificity of three

anxiety measures within an aged care setting, with the overall aim of identifying a psychometrically appropriate screening tool that can be used by RACF staff.

DECLARATION BY CANDIDATE

In the case of Chapter seven, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Study conceptualisation, design, data collection, entry, and statistical analyses, and preparation of manuscript.	75

The following co-authors contributed to the work:

Name	Nature of contribution
Dr. Tanya Davison	Provided guidance on the study design and data collection, as well as consultation on the ideas expressed in the manuscript, the reading of drafts and provision of feedback and suggestions.
Professor David Kissane	Provided guidance on the study design and data collection, as well as consultation on the ideas expressed in the manuscript, the reading of drafts and provision of feedback and suggestions.

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work:

Candidate's Signature		Date 15/01/2018

Main Supervisor's Signature		Date 15/01/2018

CHAPTER SEVEN

THE PSYCHOMETRIC PROPERTIES, SENSITIVITY AND SPECIFICITY OF THE GERIATRIC ANXIETY INVENTORY, HOSPITAL ANXIETY AND DEPRESSION SCALE, AND RATING ANXIETY IN DEMENTIA SCALE IN AGED CARE RESIDENTS

7.1. PREAMBLE TO EMPIRICAL PAPER TWO

This chapter presents the second empirical paper of the thesis, which aimed to determine an appropriate screening tool for anxiety within aged care settings. Based on the findings of the review presented in *Chapter three* and the discovery that anxiety remains significantly under-detected by RACF staff in empirical paper one (see *Chapter six*), it was evident that there is a substantial lack of research and understanding on how best to detect this condition within the RACF population. Thus, this paper aimed to examine and compare the reliability, validity, sensitivity, and specificity of the three most commonly used measures of anxiety within aged care samples: the GAI, RAID, and HADS-A. This paper also aimed to establish specific cut-offs for the identification of generalised anxiety disorder (GAD) to guide researchers, clinicians and facility staff in the use of these measures in RACF settings.

As noted in the introduction of the following paper, the focus was on the ability of each measure to identify GAD in particular rather than any DSM-5 (APA, 2013) anxiety disorder. Accurate identification of GAD in elderly residents is critical, as it is the most prevalent anxiety disorder in RACFs (Cheok, Snowdon, Miller, & Vaughan, 1996; Creighton, Davison, & Kissane, 2018; Junginger, Phelan, Cherry, & Levy, 1993). Given the symptoms of GAD are typically more cognitive and less overt than other anxiety disorders (Arroll & Kendrick, 2009), it may also be the condition most likely to remain undetected by staff. Thus, evidence of accurate screening measures to detect this condition would likely improve the recognition of anxiety among older adults living in RACFs.

The following paper is currently under review by the journal *Aging & Mental Health*; a peer-reviewed journal with an impact factor of 2.658 (ISI Web of Science, 2017). Table and figure numbers have been amended to ensure consistency throughout the thesis, however the manuscript has been presented in the style of the journal's submission requirements.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2018). *The psychometric properties, sensitivity and specificity of the geriatric anxiety inventory, hospital anxiety and depression scale, and rating anxiety in dementia scale in aged care residents.* Manuscript submitted for publication.

The Psychometric Properties, Sensitivity and Specificity of the Geriatric Anxiety Inventory, Hospital Anxiety and Depression Scale, and Rating Anxiety in Dementia Scale in Aged Care Residents

Alexandra S. Creighton[1,2] (Email: ████████████████████ Tanya E. Davison[2,3] (Email: ████████████████ David W. Kissane[2]* (Email:

████████████████

[1]School of Psychological Sciences, Monash University, Clayton, Victoria, Australia

[2]Department of Psychiatry, Monash University, Clayton, Victoria, Australia

[3]Institute for Health & Ageing, Australian Catholic University, Melbourne, Victoria, Australia

*Corresponding author: Professor D. W. Kissane. Address: Level 3, P Block, Monash Medical Centre, ████████████████████ Australia. Telephone: ███████████

E-mail: ████████████████

Abstract

Objectives: Anxiety is one of the most prevalent psychological conditions in aged care residents; however limited research has been conducted into the identification of a valid and reliable screening measure for anxiety in this setting. The current study aimed to determine an appropriate screening tool for anxiety within aged care settings by comparing the reliability and validity of three commonly used measures and identifying specific cut-offs for the identification of generalized anxiety disorder (GAD).

Method: One-hundred and eighty nursing home residents (mean age = 85.39 years) completed the GAI, HADS-A, and RAID, along with a structured diagnostic interview, the Mini International Neuropsychiatric Interview (MINI).

Results: Twenty participants (11.1%) met DSM-5 criteria for GAD. All measures had good psychometric properties within the aged care sample, although reliability estimates for the HADS-A were sub-optimal. Privileging sensitivity for a screening measure, the GAI cut-off score of 9 gave sensitivity of 90.0% and specificity of 86.3%; HADS-A cut-off of 6 gave sensitivity of 90.0% and specificity of 80.6%; and RAID cut-off of 11 gave sensitivity of 85.0% and specificity of 72.5%.

Conclusion: While all three measures had adequate reliability, validity, and cut-scores with high levels of sensitivity and specificity to detect anxiety within aged care, the GAI appeared to be the most consistently reliable and valid measure for screening for GAD. These findings may be helpful in the selection of the optimal measure and threshold scores for screening this growing, frail population.

Keywords: Anxiety, long-term care, assessment, psychometrics, older adults

Introduction

Anxiety is one of the most common psychological disorders among older adults

(Gum, King-Kallimanis, & Kohn, 2009), and is particularly prevalent among residents of

residential aged care facilities (RACFs; also known as nursing homes, hostels, assisted living

facilities, or long-term care/residential homes). Within this setting, anxiety disorder rates

are thought to be between 3.2% and 20.0% (see Creighton, Davison, & Kissane, 2015 for a

review) and are strongly associated with factors such as depression, social and functional

impairment, and poorer wellbeing (Creighton, Davison, & Kissane, 2016).

However, despite being one of the most common and treatable conditions, less

than half of residents with anxiety symptoms are detected and reported by RACF health

professionals (Drageset, Eide, & Ranhoff, 2013). One key contributing factor is the limited

attention the assessment of anxiety in aged care has received in both research and clinical

contexts, particularly when compared to depression. For instance, within Australian RACFs

the Cornell Scale for Depression in Dementia (Alexopoulos, Abrams, Young, & Shamoian,

1988) is routinely administered to screen residents for depression (Australian Institute of

Health and Welfare [AIHW], 2013). However, currently there is no well-validated screening

tool routinely used to assess residents for anxiety. Widespread sensory deficits, cognitive

impairment, and medical and psychological comorbidities among RACF residents can impact

on anxiety presentation and increase the difficulty of assessing psychological conditions

(Edelstein et al., 2007). However, the high prevalence and disabling negative outcomes of

anxiety highlight the critical need for an accurate, valid, and reliable screening measure for

this frail and growing population.

Based on a review by Creighton, Davison, & Kissane (2017), the three most

frequently used measures to assess for anxiety in aged care are the Geriatric Anxiety

Inventory (GAI; Pachana et al., 2007), the anxiety subscale of the Hospital Anxiety and

Depression Scale (HADS-A; Zigmond & Snaith, 1983), and the Rating Anxiety in Dementia

scale (RAID; Shankar, Walker, Frost, & Orrell, 1999). While previous research has found these measures to be reliable and valid for community-dwelling older adults (e.g., Johnco et al., 2015; Roberts, Fletcher, & Merrick, 2014), RACF residents are typically older and more cognitively and functionally impaired (AIHW, 2015). Thus, it cannot be assumed that anxiety measures that are accurate, valid and reliable within the community are also appropriate for the RACF setting, and data on the psychometric properties of these measures within this context are required. Note that, given the widespread popularity of the GAI, RAID, and HADS-A and the fact that other measures were found to have been used by only one or two studies (e.g. Mansbach, Mace, & Clark., 2015), the abovementioned tools were selected as they were deemed to have the most research and clinical relevance.

Only limited research on the suitability of these anxiety measures for use with the RACF population is currently available, despite their common use by researchers within this setting. To illustrate, there is only one study examining the properties of the RAID (Goyal, Bergh, Engedal, Kirkevold, & Kirkevold, 2016), one examining the HADS-A, (Haugan &Drageset, 2014), and two examining the GAI (Boddice, Pachana, & Byrne, 2008; Gerolimatos, Gregg, & Edelstein, 2013). This limits the ability to draw firm conclusions about the use of these measures within the RACF setting. Of particular concern, while studies have considered the sensitivity and specificity of the RAID (Goyal et al., 2016) and GAI (Gerolimatos et al., 2013), the researchers did not utilise a gold-standard diagnostic measure as the criterion standard for the presence of an anxiety disorder. Existing literature is also limited by the recruitment of small sample sizes, with only 27 and 75 residents included in the studies by Boddice et al. (2008) and Gerolimatos et al. (2013), respectively. Similarly, the young age of the sample (Mean age = 69.60 years) and high percentage of residents with psychotic disorders (46.7%) recruited by Gerolimatos et al. (2013) further limits the generalizability and applicability of results to the wider RACF population.

To address the limitations of previous studies and the overall gaps in the literature,

the current study evaluated the psychometric properties of the GAI, HADS-A, and RAID in a larger sample of RACF residents, with the aim of identifying an appropriate measure to facilitate the detection of anxiety within this vulnerable and growing population. Internal consistency, inter-rater reliability (for the RAID only), and concurrent validity of each of the three measures was assessed. The predictive accuracy of each measure for identifying the presence or absence of DSM-5 (American Psychiatric Association [APA], 2013) Generalized Anxiety Disorder (GAD) was also investigated, with the sensitivity and specificity of recommended or frequently used cut-off scores being examined, as well as the identification of optimal cut-scores. Last, given that cognitive impairment is highly prevalent among aged care residents (Matthews & Dening, 2002) and anxiety has been found to have an overlap of symptoms (e.g., fatigue, restlessness) and be more prevalent in older adults with cognitive deficits (Chand, Ravi, & Manepalli, 2014), the current study also aimed to determine whether cognition had an impact on each of the measure's validity.

We aimed to determine each measure's ability to detect GAD rather than any DSM-5 (APA, 2013) anxiety disorder as not only has it been found to be the most prevalent anxiety disorder in RACFs (Cheok, Snowdon, Miller, & Vaughan, 1996; Junginger, Phelan, Cherry, & Levy, 1993), it is also likely to be the anxiety disorder that goes undetected by staff. Unlike panic disorder and agoraphobia – where the symptoms are typically overt, somatic in nature, and often lead to medical attention being sought (Buccelletti et al., 2013) or significant avoidance of places or situations (APA, 2013) – individuals with GAD are often reluctant to disclose their anxiety symptoms as they do not view them as being 'medical' (Arroll & Kendrick, 2009). Thus, from a clinical standpoint, the identification of an accurate and appropriate screening measure for generalized anxiety symptoms will help assist nursing staff to accurately identify RACF residents who require further assessment; residents who may have otherwise remained undetected and subsequently untreated.

Methods

Study design

This study utilized a cross-sectional, observational design. Ethics approval was granted by the Monash University Human Research Ethics Committee.

Participants

Between March 2015 and November 2016, participants were recruited from 12 RACFs within southern and eastern metropolitan Melbourne, Australia. Residents were excluded from the study if they: were <65 years old; had resided at the RACF for <3 months; scored <18 on the Mini-Mental State Examination (MMSE); had a diagnosis of schizophrenia or bipolar affective disorder; or were unable to complete clinical assessments due to illness, medication, sensory or speech impairment, intellectual disability, or lack of language fluency. Figure 7.1 provides an overview of participant recruitment with reasons for exclusion or refusal indicated.

[Figure 7.1 near here]

A total of 180 residents were recruited across 12 RACFs; 120 women (*M* age = 86.01 years, *SD* = 7.59) and 60 men (*M* age = 84.14 years, *SD* = 6.91). Further demographic information is provided in Table 7.1.

[Table 7.1 near here]

Measures

Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975)

Cognitive functioning was assessed using the MMSE; a commonly used cognitive screening instrument comprising 11-items assessing orientation, memory recall, attention, language, comprehension, and visuospatial skills. The MMSE provides an overall score out

of 30, with commonly accepted cut-off points being: 24-30 for normal cognition; 18-23 for

mild cognitive impairment; and 0-17 for moderate to severe cognitive impairment

(Tombaugh & McIntyre, 1992).

Geriatric Anxiety Inventory (GAI; Pachana et al., 2007)

The GAI is a 20-item self-report measure of general anxiety symptoms experienced

over the last week. Specifically developed for older adults, each item is answered using a

dichotomous agree/disagree format and utilizes language commonly employed by older

adults to describe anxiety (e.g., "butterflies in my stomach"). Total scores range from 0 to

20, with higher scores indicating greater anxiety. In the original study by Pachana et al.

(2007), a score of 10/11 was established as the optimal cut-off to distinguish between older

adults with and without an anxiety disorder. However, within an RACF sample, Gerolimatos

et al. (2013) reported the optimal cut-off to be ≥9. Thus far, the GAI has been found to have

sound psychometric properties in elderly community-dwelling samples (Gould et al., 2014),

psychogeriatric patients (Johnco et al., 2015; Pachana et al., 2007), and in a sample of RACF

residents (Gerolimatos et al., 2013).

Hospital Anxiety and Depression Scale – Anxiety Subscale (HADS-A; Snaith & Zigmond, 1994)

The HADS-A is a seven-item self-report subscale of the HADS that assesses for the

presence and severity of anxiety symptoms experienced over the last week. Somatic

symptoms of anxiety (e.g., dizziness, insomnia) were excluded from the measure to avoid

the confounding effects of physical symptoms and enable the tool to be used with medical

patients. Each item is rated using a 4-point Likert-type scale from 0 to 3, with scores on the

subscale ranging from 0 to 21. The authors recommend cut-off scores of 7/8 to indicate

probable anxiety for the subscale, with scores between 10/11 suggestive of possible

diagnoses (Zigmond &Snaith, 1983). However, more recently the optimal balance between

sensitivity and specificity for a clinical diagnosis has most frequently been achieved at ≥8

(Bjelland, Dahl, Haug, & Neckelmann, 2002).

To the authors' knowledge, no previous research has determined an optimal cut-score for the HADS-A within RACFs. The lack of a clinical cut-off is evidenced by various scores used across aged care studies to determine anxiety cases; ranging from ≥8 (Dozeman et al., 2012) to ≥11 (Drageset et al., 2013). To date, the HADS-A has been found to have good psychometric properties in elderly community-dwelling samples (Roberts et al., 2014), and hospitalised older adults (Helvik, Engedal, Skancke, & Selbaek, 2011). Within RACFs, Haugan and Drageset (2014) reported mixed evidence for the reliability and validity of the HADS-A; with internal consistency ranging from poor to excellent, good composite reliability, and mixed discriminant validity.

Rating Anxiety in Dementia Scale (RAID; Shankar et al., 1999)

The RAID is a 20-item clinician-rated scale developed to assess anxiety in the cognitively impaired over the last two weeks. Eighteen items are rated from 0 (absent) to 3 (severe) by the clinician using information derived from an interview with the resident, a caregiver, and medical notes. Two items assess phobias and panic attack symptoms and require no rating and do not contribute to the total score. The measure covers aspects of anxiety including worry, apprehension, vigilance, autonomic hypersensitivity. Scores range from 0 to 54, with higher scores indicating higher anxiety levels. Shankar et al. (1999) recommended a cut-off score of ≥11 to detect residents with anxiety, while Goyal et al. (2016) found a cut-score of 11/12 provided the best senstitivty and specficity within an RACF sample. To date, the RAID has been reported to have good reliability and validity within geriatric inpatient wards, day centres, hospitals, geriatric day clinics, and RACFs (Goyal et al., 2016; Shankar et al,. 1999; Snow et al., 2012).

To increase standardization across raters, this study used the structured interview guide for the RAID developed by Snow et al. (2012). This guide has been found to have adequate reliability and validity in older adults with dementia (Snow et al., 2012).

MINI International Neuropsychiatric Interview version 6.0.0 (MINI; Sheehan et al., 1998)

The MINI is a widely used, short, structured diagnostic interview that ascertains the

diagnosis of mental disorders according to DSM-5 (APA, 2013) criteria. In the current study,

the MINI was used as the gold-standard diagnostic measure for DSM-5 (APA, 2013) GAD.

While not specifically developed for older adults, the MINI has been frequently used with

both elderly community-dwelling (e.g., Cheung et al., 2012) and RACF (e.g., Dozeman et al.,

2012) samples. Furthermore, it has also been used as the gold-standard measure for

anxiety in previous geriatric validation studies (e.g., Cheung et al., 2012; Pachana et al.,

2007).

Procedures

Using a random number generator, 19 RACFs were randomly selected from a list of

all facilities within southern and eastern metropolitan Melbourne and invited to participate

via phone call and email. Twelve facilities agreed to participate, including private

companies, non-for-profit and religious organizations, and government-funded facilities. Of

the facilities that did not participate, three were private companies, two were religious, one

was community-based, and one was managed by the local government. Four facilities

stated that they had too many current demands and so did not have capacity to participate,

one was no longer a residential aged care facility, one was an ethnic-specific facility (with

more than 80% of residents being non-English speaking), while one facility stated that they

did not participate in research due to privacy concerns. Bivariate analyses revealed no

significant differences between facilities that did and did not participate in the study with

regards to facility type, size, or location.

Screening and identification of potential participants was completed with the

assistance of the manager and/or director of nursing at each participating facility. Eligible

residents were approached by the first author (AC) and completed a screening process

developed by Warner and colleagues (2008) to determine their capacity to provide

informed consent. If deemed able to provide informed consent, residents were invited to

participate in the study and sign the consent form. For those considered unable to provide

consent themselves, the 'person responsible' (typically a family member) was approached

to provide written informed consent, however verbal assent from the participant was

obtained prior to the interview. The MMSE was then administered, with residents scoring

<18 excluded, as well as residents who met other exclusion criteria.

Clinical Interview

Eligible participants were administered the MINI to determine the

presence/absence of GAD. The GAI, HADS-A, and RAID were also administered on the same

day, with each measure being completed using an interview format to ensure participant's

understood each item. To control for ordering effects on the administration of the

measures, approximately half the participants were administered the GAI, RAID, and then

HADS-A, while the remaining half completed the HADS-A, GAI, and then the RAID. As

scoring the RAID requires clinical judgement, a trained Honours student completed and

scored the RAID for a subsample of residents (n = 19) at the same time as AC to assess inter-

rater reliability.

Staff-informant interview

The informant interview for the RAID was completed with a staff member familiar

with the resident and/or had been involved in the resident's care over the last two weeks.

Again, the Honours student was present for a subsample of informant interviews, and

completed and scored the RAID at the same time as AC.

Statistical analyses

Data were collated and analysed using MedCalc and the Statistical Package for

Social Sciences (SPSS) version 22, with an alpha of 0.05 used for all statistical analyses.

Internal consistency was assessed using Cronbach's alpha. Inter-rater reliability was

assessed using Cohen's Kappa (κ). Concurrent validity was assessed by the completion of

spearman correlations between each of the three measures as all were found to have a

non-normal distribution and be positively skewed. Non-parametric Mann-Whitney U tests were conducted to determine whether participants with a GAD diagnosis received a significantly higher score on each measure than participants without this diagnosis.

Receiver Operating Characteristic (ROC) curves were constructed to determine which measure was best at detecting and discriminating between participants with and without a GAD diagnosis and to establish the optimal cut-scores. To investigate whether level of cognitive impairment had any impact on the validity of the GAI, RAID, or HADS-A, a separate ROC curve analysis was also completed whereby the sample was divided into two groups based on whether participants were considered to have mild cognitive impairment (MMSE score of 18-23) or normal cognitive functioning (MMSE score of 24-30). Overall accuracy, sensitivity, specificity, positive predictive values (PPV), and negative predictive values (NPV) were calculated for each of the scales. Youden's index (J) was also calculated for each score to determine the optimal value that maximized sensitivity and specificity, with a maximum value J can attain being 1.0 which indicates a perfect test (Bewick, Cheek, & Ball, 2004). For ROC curves, the methods established by Hanley and McNeil (1983) were used to determine if there was a statistically significant difference in AUCs between the GAI, HADS-A, and RAID, and to determine whether there was a significant difference in performance of the scales across cognitive status.

Results

Twenty participants (11.1%) met DSM-5 (APA, 2013) criteria for GAD using the MINI (Sheehan et al., 1998). Mean total scores for each completed measure for the total sample and participants with and without GAD can be found in Table 7.2.

[Table 7.2 near here]

Reliability

Cronbach's alpha revealed the internal consistency of the HADS-A, RAID, and GAI to be 0.80, 0.85, and 0.95, respectively. Using Altman's (1999) guidelines, good agreement between the two raters' scoring of the RAID was found for the subsample of participants (n = 19), κ = 0.77 (95% CI = 0.57 to 0.96), $p < 0.001$.

Validity

Spearman correlations between the GAI, HADS-A, and RAID found strong, positive correlations between the three measures, with correlations being between $r = 0.54$ and $r = 0.71$, $p < 0.01$ (see Table 7.3). Mann-Whitney U tests indicated that participants meeting criteria for GAD were found to have a significantly higher mean total score on the GAI ($z(N = 180) = -6.47$, $p < 0.001$), HADS-A ($z(N = 180) = -6.07$, p < 0.001), and RAID ($z(N = 180) = -5.41$, $p < 0.001$) when compared to participants who did not meet diagnostic criteria.

[Table 7.3 near here]

Performance of the scales

Figure 7.2 illustrates the ROC curves for the GAI, HADS-A, and RAID, with the area under the curve (AUC) for all measures found to be significantly different from the random 'line of no information' ($p < 0.001$). The specific AUC and confidence intervals (CI) for each respective measure were: GAI AUC = 0.93 (95% CI = 0.88 – 0.98), HADS-A AUC = 0.91 (95% CI = 0.86 – 0.97) and RAID AUC = 0.87 (95% CI = 0.81 – 0.94). However, comparisons of AUCs revealed no significant differences between the GAI and HADS-A ($z = 0.63$, $p = 0.53$), and the HADS-A and RAID ($z = -1.31$, $p = 0.19$), while the difference between the GAI and RAID just reached significance ($z = 1.99$, $p = 0.047$).

[Figure 7.2 near here]

The Impact of Cognition on the Performance of the Scales

To investigate whether level of cognitive impairment had any impact on each measure's validity, the sample was divided into those participants with an MMSE score of 18 to 23 (i.e., mild cognitive impairment) and those with an MMSE of 24 to 30 (i.e., normal cognition), and a ROC analysis was run for each group. The AUC for each measure was found to be significantly different from the random 'line of no information' ($p < .01$) for both participants with and without cognitive impairment, with the specific AUC and CIs for each respective measure within each group found in Table 7.4. No significant differences in the performance of the scales were found between participants with mild cognitive impairment and normal cognitive function (GAI: $z = -1.22$, $p = .222$; HADS-A: $z = -1.09$, $p = .278$; RAID: $z = -.72$, $p = .472$).

[Table 7.4 near here]

Sensitivity, specificity, and optimal cut-scores

Table 7.5 summarizes the performance indices of various cut-scores for the GAI, HADS-A, and RAID when compared with a DSM-5 diagnosis of GAD. Given the aim was to identify and validate an instrument that can be used as a screening tool, cut-scores that maximized sensitivity while maintaining reasonable specificity were identified to ensure the maximum number of true cases were detected, while minimizing false positives. Thus, as recommended by Bennett and Lincoln (2006), cut-scores with a sensitivity of ≥80% and specificity of ≥60% were sought.

GAI

As seen in Table 7.5, at the previously recommended cut-score of ≥9 for RACF residents, the GAI correctly identified 18 (out of 20) true positive cases and 138 (out of 145) true negatives, for an overall accuracy of 86.7%. False positives totalled 22 and false

negatives, 2. This cut-score maximized sensitivity (90.0%) and yielded a specificity of 86.3%, NPV of 98.6%, and PPV of 45.0%. Thus, nearly all participants with a GAD diagnosis were correctly identified, however more than half of those identified as having GAD were false alarms.

Raising the cut-score from ≥9 to ≥10 reduced sensitivity to 85.0% and increased specificity to 88.7%, with 17 true positives, 3 false negatives, and an overall accuracy rate of 88.3%. While this higher cut-score slightly reduced the number of true positives cases identified by one case, it also resulted in a reduction of false positives from 22 to 18 and an increase in true negatives from 138 to 142, thus the PPV increased to 48.6%. Moreover, as indicated by the Youden's index, this cut-off provided the highest level of sensitivity and specificity.

HADS-A

At the cut-off of ≥8 the HADS-A identified 14 true positives and 142 true negative cases, for an overall accuracy rate of 86.7% (see Table 7.5). This resulted in a sensitivity of 70.0%, specificity of 88.7%, PPV of 43.8% and NPV of 96.0%. At this score, less than three quarters of true cases were identified and over half of those above cut-off were false positives.

Using Youden's index, the optimal cut-score for the HADS-A was found to be ≥6; which identified 18 true positives, 129 true negatives, and led to an overall accuracy rate of 81.7%. This score maximized sensitivity (90.0%) and yielded a specificity of 80.6%, PPV of 36.7%, and NPV of 98.5%. Thus, this cut-score maximized the sum of sensitivity and specificity. These results suggest that, while PPV reduced, nearly all participants with a DSM-5 GAD diagnosis were correctly identified using this cut-off.

[Table 7.5 near here]

RAID

As shown in Table 7.5, at the recommended cut-score of ≥11 the RAID correctly identified 17 true positive cases and 116 true negatives, for an overall accuracy rate of 73.9%. False positives totalled 44 and false negatives, 3. Sensitivity was therefore found to be 85.0%, specificity was 72.5%, and PPV and NPV were 27.9% and 97.5%, respectively. Thus, while this score maximized sensitivity and therefore led to the majority of participants with DSM-5 GAD being correctly identified, the majority of those who scored above the cut-off within this sample were false alarms.

Within the current RACF sample, Youden's index indicated the cut-score that balanced sensitivity and specificity for the RAID was ≥17, which correctly identified 15 true positives and 134 true negatives and had an overall accuracy rate of 82.8%. This yielded a sensitivity of 75.0%, specificity of 83.8%, and PPV and NPV of 36.6% and 96.4%, respectively.

Discussion

To the authors' knowledge, this is the first study to administer multiple anxiety measures to an elderly RACF sample with the aim of identifying an appropriate anxiety screening measure for this setting. This was done by: (1) examining the psychometric properties of the GAI, HADS-A, and RAID; and (2) examining the sensitivity and specificity of each measure and determining the optimal cut-score to distinguish between residents with and without DSM-5 (APA, 2013) GAD.

Reliability

The findings regarding the reliability of the GAI and RAID are consistent with previous studies that have examined the psychometric properties of these measures in elderly RACF (Gerolimatos et al., 2013; Goyal et al., 2016), community-based (Johnco et al., 2015), and medical (Shankar et al., 1999) samples, and provides preliminary evidence that both tools function reliably in measuring anxiety within aged care settings. Previous research on the HADS-A's reliability with older adults has found variable levels of internal

reliability; ranging from poor to excellent within a RACF sample (Haugan & Drageset, 2014), and adequate to excellent in elderly community-dwelling (Roberts et al., 2014) and medical patients (Helvik et al., 2011). The current study suggests good internal consistency of the subscale within the RACF sample; however, given the range in estimates and limited research examining the HADS-A in RACFs (with only one previous study found), some doubt is cast about its robustness for elderly aged care residents.

Similarly, using the structured interview by Snow et al. (2012), evidence of good inter-rater reliability for the RAID is again consistent with previous research, where the measure has been reported to have moderate to good inter-rater reliability among elderly RACF residents and medical patients (Goyal et al., 2016; Shankar et al., 1999). This suggests that despite its scoring requiring a level of clinical judgement, the RAID may achieve consistent outcomes across clinicians within RACFs when staff use the structured scoring criteria and have received training on how to complete the measure.

Validity

All three anxiety measures correlated from moderately to highly, with the RAID and HADS-A found to have the weakest relationship and the GAI and HADS-A found to have the strongest. These intercorrelations can be considered evidence of concurrent validity and suggest all three scales measure nearly the same construct within aged care settings.

All anxiety measures distinguished residents with a diagnosis of GAD from other residents, with participants with GAD scoring significantly higher on all three measures than those without a diagnosis. These findings provide initial evidence for the discriminant validity of each measure within RACFs, and are similar to previous studies conducted in elderly community samples (Johnco et al., 2015; Snow et al., 2012).

Performance of the scales

The operational characteristics of each measure in screening for GAD were

examined via ROC curves, with the aim of identifying which instruments could be validly used as screening tools. Overall, all measures were found to be able to detect GAD at greater than chance level, and all had cut-scores that met Bennett and Lincoln's (2006) recommended levels of sensitivity and specificity. The AUCs revealed the GAI to have the highest curve of all the measures, followed by the HADS-A. Using Hanley and McNeil's (1983) method, a statistical difference in diagnostic performance was found only between the GAI and the RAID, suggesting the GAI identified GAD within the RACF sample significantly better than the RAID. This was not surprising given the RAID had only moderate accuracy, as indicated by an AUC between 0.70 and 0.90 (Streiner & Cairney, 2007). However, it must be noted that a non-significant difference does not indicate equivalence between tests (Pintea & Moldovan, 2009). For instance, visual inspection of the curves in Figure 7.2 suggests there is a diagnostic performance difference in favour of the GAI at all sensitivity and specificity levels and all intervals of these parameters, as indicated by its higher curve and lack of overlap with the curves of the other measures (Pintea & Moldovan, 2009). This is further confirmed by the GAI's better overall accuracy, sensitivity, and specificity at its optimal cut-point when compared to those of the HADS-A and RAID.

One reason for the GAI's higher AUC may be that its item content is more similar to the DSM-5 diagnostic criteria for GAD. Thus, the GAI covers more aspects of the symptoms and therefore has a more comprehensive content validity for the current concept of the disorder. In contrast, the items on the HADS-A are restricted to only three aspects of GAD (worry, restlessness, and muscle tension) and only addresses one central criterion of the disorder.

One possible reason for the slightly poorer accuracy of the RAID compared to the GAI may be the effect symptom visibility had on staff-informant reports, with previous research finding that cognitive and emotional symptoms of anxiety and depression in older adults are more difficult for informants to rate than the overt, behaviourally-based

symptoms (McDade-Montez et al., 2008). As some items on the RAID (particularly those assessing worry) assess anxiety symptoms that may not be easily recognized or observed by RACF staff, there may have been discrepancies between self- and informant-reported symptoms which resulted in a slightly less accurate overall score. The accuracy of staff reports may have also been further compromised given their busy schedules and care for large numbers of residents, with research finding RACF staff only spend an average of 27 minutes of direct care time per resident each day (Qian, Yu, Hailey, Zhang, & Davy, 2014).

With regards to the impact of cognition on the validity of each measure, the findings indicated that the GAI, HADS-A and RAID were all able to detect GAD in participants with mild cognitive impairment and normal cognitive function at greater than chance level. Similarly, no significant differences in performance of the scales were found between participants with and without cognitive impairment. This suggests that within the current sample, the GAI, HADS-A, and RAID were all able to identify residents with and without GAD, irrespective of cognitive status. However, although not statistically significant, it is important to note that the AUCs for each measure were higher for residents with normal cognitive function than for residents with mild cognitive impairment, indicating better accuracy and performance in residents with normal cognition. This is likely due to the difficulty identifying anxiety in patients with cognitive impairment given the overlapping symptoms with anxiety, as well as the difficulty individual's with cognitive impairment may have in identifying and reporting symptoms. Future research that includes residents with more severe levels of cognitive impairment should aim to determine the impact of cognition on the validity of these measures, as this will help clarify and extend current findings.

Sensitivity, specificity, and optimal cut-scores

As this study aimed to determine the appropriateness of anxiety measures as a screening tool, maximizing sensitivity (while maintaining reasonable specificity) is needed to

ensure few actual cases are missed. Thus, for the GAI, the optimal cut-point for the screening of GAD within the RACF sample was ≥9, which is consistent with the recommended cut-off found in an aged care sample by Gerolimatos et al. (2013). However, it is important to note that at this cut-point only 45% of participants who tested positive had a GAD diagnosis, meaning a number of residents were 'false alarms'. Thus, from a clinical standpoint, this could potentially lead to a number of residents having to endure unnecessary further assessments. One potential remedy for this would be to raise the GAI's cut-off to ≥10, as this maximized the sum of sensitivity and specificity as well as increased PPV.

For the HADS-A, the optimal cut-off of ≥6 found for the RACF sample was lower than the established recommended cut-score of 8 (Bjelland et al., 2002). Although a lowering of cut-offs to improve sensitivity is common practice when screening for a disorder, optimal cut-scores for the HADS-A vary between elderly samples. For example, Dennis, Boddington, and Funnell (2007) recommended a score of ≥8 for elderly community and primary care patients, while Cheung et al. (2012) recommended a lower score of 3/4 and 2/3, respectively. Similarly, the lower internal reliability of the scale found within the current RACF sample and its limited ability to address the whole construct of GAD further reduces its usefulness as a screening measure. Thus, given the range in optimal scores and concerns around its usefulness in identifying anxiety in older adults (Dennis et al., 2007), the use of the HADS-A with RACF residents remains dubious. Moreover, given that (to the authors' knowledge) the current study is the first to examine the sensitivity and specificity of the measure in RACF residents, replication within this setting is needed, particularly as it is one of the most frequently used measures in RACF research.

A cut-off of ≥11 for the RAID maximized sensitivity and therefore optimized its use as a screening tool with RACF residents. This is consistent with recommended cut-offs reported by previous studies (Shankar et al., 1999), including a study conducted within an

aged care setting (Goyal et al., 2016). However, at this score the PPV for the sample was found to be only 27.9%; suggesting a very high level of false positives. Using Youden's index, increasing the cut-point to ≥17 was found to increase PPV to 36.6% as well as maximize sensitivity and specificity. However, sensitivity was reduced to 75.0%, therefore from a clinical standpoint this score may not be adequate for screening purposes.

Limitations

There are some limitations to the current evaluation of anxiety measures within RACFs. First, residents with moderate to severe cognitive impairment and those with difficulty communicating were excluded. Thus, the generalizability of the findings are limited to those capable of completing the measures, therefore future research that includes residents with more severe cognitive impairment is warranted. Second, as previous researchers have noted (Versi, 1992), there is inherent difficulty in obtaining a true 'gold-standard' measure against which to compare measures, and therefore it cannot be said that the MINI did not make any classification errors. Moreover, given that previous research has found previous DSM criteria may not perfectly discriminate between older adults with and without an anxiety disorder (Grenier et al., 2011), there is a possibility that residents experiencing clinical levels of anxiety were not detected by the criterion standard. With regards to discriminant validity, the inclusion of a depression measure to assess discriminant validity would have been beneficial. Future research should therefore attempt to address this limitation as this will help determine the most specific measure of anxiety, particularly given its conceptual overlap with depression among older adults (Beekman et al., 2000). Lastly, while all measures were administered to participants in a different order in attempt to reduce the impact of fatigue, it is important to note that some participants may have responded in a manner that minimizes the burden of responding. This may have been particularly relevant for the RAID, where participants are asked for additional information if they answered 'yes' to the first question. Future research should therefore

aim to reduce fatigue by taking short breaks or administering the measures over more than one sitting.

Conclusion

In conclusion, the findings suggest that all three measures have satisfactory psychometric properties within the current sample. However, based on the combination of findings from previous literature and the current study, the GAI appears to be the most reliable, valid, and accurate measure in detecting residents with GAD, with strong support for the use of a cut-off of 9/10 within RACFs. While replication of these findings is needed, the current study's identification of a valid, reliable, and easy-to-use measure of anxiety for RACF residents is encouraging and may help ensure more accurate and routine screening practices occur within these settings. For example, as is done for depression within Australian RACFs, it would be beneficial for facilities to screen for anxiety in all residents admitted to the facility, as this would help ensure effective and appropriate treatment is provided as soon as possible.

or not-for-profit sectors.

Description of authors' roles

With the assistance of TD and DK, AC designed the study and wrote the protocol, undertook

the statistical analysis and interpretation and wrote the first draft of the manuscript. TD and

DK read and provided comments and suggestions for all further drafts. All authors have

contributed to and approved the final manuscript.

References

Alexopoulos, G. S., Abrams, R., Young, R. C., & Shamoian, C. A. (1988). Cornell scale for depression in dementia. *Biological Psychiatry, 23*(3), 271-284. doi: 10.1016/0006-3223(88)90038-8

Altman, D. G. (1999). *Practical statistics for medical research*. New York, NY: Chapman & Hall/CRC Press.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association.

Arroll, B., & Kendrick, T. (2009). Anxiety. In L. Gask, H. Lester, T. Kendrick & R. Peveler (Eds.), *Primary Care Mental Health* (pp. 145-155). London, UK: RCPsych Publications.

Australian Institute of Health and Welfare. (2013). *Depression in residential aged care: 2008-2012*. Canberra, ACT: AIHW.

Australian Institute of Health and Welfare. (2015). *Residential Aged Care and Home Care 2014-15*. Canberra: Australian Institute of Health and Welfare.

Beekman, A. T. F., De Beurs, E., Van Balkom, A. J. L. M., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (2000). Anxiety and depression in later life: Co-occurrence and communality of risk factors. *American Journal of Psychiatry, 157*(1), 89-95.

Bennett, H. E., & Lincoln, N. B. (2006). Potential screening measures for depression and anxiety. *International Journal of Therapy and Rehabilitation, 13*(9), 401-406.

Bewick, V., Cheek, L., & Ball, J. (2004). Statistics review 13: Receiver operating characteristic curves. *Critical Care, 8*(6), 508-512. doi: 10.1186/cc3000

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *Journal of Psychosomatic Research, 52*(2), 69-77.

Boddice, G., Pachana, N. A., & Byrne, G. (2008). The clinical utility of the geriatric anxiety inventory in older adults with cognitive impairment. *Nursing older people, 20*(8),

36-39.

Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development evaluation of personality scales. *Journal of Personality, 54*(1), 106-148.

Buccelletti, F., Ojetti, V., Merra, G., Carroccia, A., Marsiliani, D., Mangiola, F., . . . Franceschi, F. (2013). Recurrent use of the Emergency Department in patients with anxiety disorder. *European Review for Medical and Pharmacological Sciences, 17*(Suppl 1), 100-106.

Byrne, G. J., Pachana, N. A., Goncalves, D. C., Arnold, E., King, R., & Keat Khoo, S. (2010). Psychometric properties and health correlates of the Geriatric Anxiety Inventory in Australian community-residing older women. *Aging and Mental Health, 14*(3), 247-254. doi: 10.1080/13607861003587628

Chand, S., Ravi, C., & Manepalli, J. (2014). Anxiety disorders in older adults. *Current Geriatrics Reports, 3*(4), 273-281. doi: 10.1007/s13670-014-0105-6

Cheok, A., Snowdon, J., Miller, R., & Vaughan, R. (1996). Prevalence of anxiety disorders in nursing homes. *International Journal of Geriatric Psychiatry, 11*(5), 405-410. doi: 10.1002/(SICI)1099-1166(199605)11:5<405::AID-GPS302>3.0.CO;2-O

Cheung, G., Patrick, C., Sullivan, G., Cooray, M., & Chang, C. L. (2012). Sensitivity and specificity of the Geriatric Anxiety Inventory and the Hospital Anxiety and Depression Scale in the detection of anxiety disorders in older people with chronic obstructive pulmonary disease. *International Psychogeriatrics, 24*(1), 128-136. doi: 10.1017/S1041610211001426

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2017). The assessment of anxiety in aged care residents: a systematic review of the psychometric properties of commonly used measures. *International Psychogeriatrics*, 1-13. doi: 10.1017/S1041610217002599

Creighton, A. S., Davison, T., & Kissane, D. W. (2016). The correlates of anxiety among older

adults in nursing homes and other residential aged care facilities: a systematic

review. *International Journal of Geriatric Psychiatry, 32*(2), 141-154.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2015). The prevalence of anxiety among

older adults in nursing homes and other residential aged care facilities: a systematic

review. *International Journal of Geriatric Psychiatry, 31*(6), 555-566. doi:

10.1002/gps.4378

Dennis, R. E., Boddington, S. J. A., & Funnell, N. J. (2007). Self-report measures of anxiety:

Are they suitable for older adults? *Aging and Mental Health, 11*(6), 668-677. doi:

10.1080/13607860701529916

Dozeman, E., Van Marwijk, H. W. J., Van Schaik, D. J. F., Smit, F., Stek, M. L., Van Der Horst,

H. E., . . . Beekman, A. T. F. (2012). Contradictory effects for prevention of

depression and anxiety in residents in homes for the elderly: A pragmatic

randomized controlled trial. *International Psychogeriatrics, 24*(8), 1242-1251. doi:

10.1017/S1041610212000178

Drageset, J., Eide, G. E., & Ranhoff, A. H. (2013). Anxiety and depression among nursing

home residents without cognitive impairment. *Scandinavian Journal of Caring*

Sciences, 27(4), 872-881. doi: 10.1111/j.1471-6712.2012.01095.x

Edelstein, B. A., Woodhead, E. L., Segal, D. L., Bower, E. H., Lowery, A. J., & Stoner, S. A.

(2007). Older adult psychological assessment. *Clinical Gerontologist, 31*(3), 1-35.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London, UK: SAGE Publications.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state". A practical

method for grading the cognitive state of patients for the clinician. *Journal of*

Psychiatric Research, 12(3), 189-198.

Gerolimatos, L. A., Gregg, J. J., & Edelstein, B. A. (2013). Assessment of anxiety in long-term

care: Examination of the Geriatric Anxiety Inventory (GAI) and its short form.

International Psychogeriatrics, 25(9), 1533-1542. doi: 10.1017/S1041610213000847

Gould, C. E., Segal, D. L., Yochim, B. P., Pachana, N. A., Byrne, G. J., & Beaudreau, S. A. (2014). Measuring anxiety in late life: A psychometric examination of the Geriatric Anxiety Inventory and Geriatric Anxiety Scale. *Journal of Anxiety Disorders, 28*(8), 804-811. doi: 10.1016/j.janxdis.2014.08.001

Goyal, A. R., Bergh, S., Engedal, K., Kirkevold, M., & Kirkevold, Ø. (2016). Norwegian version of the rating anxiety in dementia scale (RAID-N): a validity and reliability study. *Aging and Mental Health*, 1-6. doi: 10.1080/13607863.2016.1220921

Grenier, S., Préville, M., Boyer, R., O'Connor, K., Béland, S. G., Potvin, O., . . . Brassard, J. (2011). The impact of DSM-IV symptom and clinical significance criteria on the prevalence estimates of subthreshold and threshold anxiety in the older adult population. *American Journal of Geriatric Psychiatry, 19*(4), 316-326. doi: 10.1097/JGP.0b013e3181ff416c

Gum, A. M., King-Kallimanis, B., & Kohn, R. (2009). Prevalence of mood, anxiety, and substance-abuse disorders for older Americans in the national comorbidity survey-replication. *American Journal of Geriatric Psychiatry, 17*(9), 769-781. doi: 10.1097/JGP.0b013e3181ad4f5a

Hanley, J. A., & McNeil, B. J. (1983). A method of comparing the areas under receiver operating characteristic curves derived from the same cases. *Radiology, 148*(3), 839-843. doi: 10.1148/radiology.148.3.6878708

Haugan, G., & Drageset, J. (2014). The Hospital Anxiety and Depression Scale - Dimensionality, reliability and construct validity among cognitively intact nursing home patients. *Journal of Affective Disorders, 165*, 8-15. doi: 10.1016/j.jad.2014.04.042

Helvik, A. S., Engedal, K., Skancke, R. H., & Selbaek, G. (2011). A psychometric evaluation of the Hospital Anxiety and Depression Scale for the medically hospitalized elderly. *Nordic Journal of Psychiatry, 65*(5), 338-344.

Johnco, C., Knight, A., Tadic, D., Wuthrich, V. M., Pachana, N. A., & Oude Voshaar, R. C. (2015). Psychometric properties of the Geriatric Anxiety Inventory (GAI) and its short-form (GAI-SF) in a clinical and non-clinical sample of older adults. *International Psychogeriatrics, 27*(7), 1089-1097. doi: 10.1017/S1041610214001586

Junginger, J., Phelan, E., Cherry, K., & Levy, J. (1993). Prevalence of psychopathology in elderly persons in nursing homes and in the community. *Hospital and Community Psychiatry, 44*(4), 381-383.

Mansbach, W. E., Mace, R. A., & Clark, K. M. (2014). The Brief Anxiety and Depression Scale (BADS): a new instrument for detecting anxiety and depression in long-term care residents. *International Psychogeriatrics, 27*(4), 673-681. doi: 10.1017/S1041610214002397

Matthews, F. E., & Dening, T. (2002). Prevalence of dementia in institutional care. *The Lancet, 360*(9328), 225-226. doi: 10.1016/S0140-6736(02)09461-8

McDade-Montez, E. A., Watson, D., O'Hara, M. W., & Denburg, N. L. (2008). The effect of symptom visibility on informant reporting. *Psychology and Aging, 23*(4), 940-946. doi: 10.1037/a0014297Pachana NA, Byrne GJ, Siddle H, Koloski N, Harley E & Arnold E (2007) Development and validation of the Geriatric Anxiety Inventory. *International Psychogeriatrics* 19(1): 103-114. DOI: 10.1017/S1041610206003504.

Pintea, S., & Moldovan, R. (2009). The receiver-operating characteristic (ROC) analysis: Fundamentals and applications in clinical psychology. *Journal of Cognitive and Behavioral Psychotherapies, 9*(1), 49-66.

Qian, S., Yu, P., Hailey, D. M., Zhang, Z., & Davy, P. (2014). Time spent on daytime direct care activities by personal carers in two Australian residential aged care facilities: a time-motion study. *Australian Health Review, 38*(2), 230-237.

Roberts, M. H., Fletcher, R. B., & Merrick, P. L. (2014). The validity and clinical utility of the Hospital Anxiety and Depression Scale (HADS) with older adult New Zealanders.

International Psychogeriatrics, 26(2), 325-333. doi: 10.1017/S104161021300197X

Shankar, K. K., Walker, M., Frost, D., & Orrell, M. W. (1999). The development of a valid and reliable scale for rating anxiety in dementia (RAID). *Aging and Mental Health, 3*(1), 39-49. doi: 10.1080/13607869956424

Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., . . . Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-1. *Journal of Clinical Psychiatry, 59*(Suppl. 20), 22-33.

Snaith, R., & Zigmond, A. (1994). *The Hospital Anxiety and Depression Scale Manual*. Windsor, UK: NEFER-Nelson Publishing Company Ltd.

Snow, A. L., Huddleston, C., Robinson, C., Kunik, M. E., Bush, A. L., Wilson, N., . . . Stanley, M. A. (2012). Psychometric properties of a structured interview guide for the rating for anxiety in dementia. *Aging and Mental Health, 16*(5), 592-602. doi: 10.1080/13607863.2011.644518

Streiner, D., & Cairney, J. (2007). What's under the ROC? An introduction to Receiver Operating Characteristic Curves. *The Canadian Journal of Psychiatry, 52*(2), 121-128. doi: 10.1177/070674370705200210

Tombaugh, T. N., & McIntyre, N. J. (1992). The mini-mental state examination: a comprehensive review. *Journal of the American Geriatrics Society, 40*(9), 922-935.

Versi, E. (1992). "Gold-standard" is an appropriate term. *British Medical Journal, 305*(6846), 187.

Warner, J., McCarney, R., Griffin, M., Hill, K., & Fisher, P. (2008). Participation in dementia research: Rates and correlates of capacity to give informed consent. *Journal of Medical Ethics, 34*(3), 167-170. doi: 10.1136/jme.2006.019786

Zigmond, A., & Snaith, R. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica, 67*(6), 361-370.

Screened

(*n* = 919 from 12 RACFs)

Eligible and approached

(*n* = 425)

Completed and included

in study

(*n* = 180)

Ineligible

(*n* = 494)

- Severe cognitive impairment (*n* = 236)
- Not fluent in English (*n* = 78)
- Unable to hold a clear conversation (*n* = 71)
- Resided at RACF <3 months (*n* = 52)
- Diagnosis of schizophrenia, intellectual disability and/or bipolar affective disorder (*n* = 47)
- <65 years of age (*n* = 9)
- Not approached as requested by staff (*n* =1)

Did not participate (*n* = 245)

- Resident refused or 'person responsible' did not provide consent (*n* = 119)
- Too cognitively impaired (*n* = 74)
- Resident passed away before being interviewed (*n* = 21)
- Too physically ill (*n* = 10)
- Too hard of hearing (*n* = 8)
- Resident was unavailable to be interviewed during visits (*n* = 8)
- Unable to hold conversation (*n* = 4)
- Not fluent in English (*n* = 1)

Figure 7.1. Participant recruitment flowchart.

Table 7.1

Demographic Characteristics of the Sample (*N* = 180)

Characteristic	*N*	%	Mean	*SD*	Range
Age (years)			85.4	7.4	66-101
Sex					
Male	60	33.3			
Female	120	66.7			
Marital Status					
Never married/single	12	6.7			
Married	34	18.9			
Divorced/separated	36	20.0			
Widowed	96	53.3			
Other	2	1.1			
Years of education			10.8	3.3	1-21
Cognitive functioning (MMSE score)			24.7	3.6	18-30
Length of stay (years)			2.6	2.5	0.2-12.6

Note: SD = standard deviation; MMSE = Mini-Mental State Examination.

Table 7.2

Mean Scores and Standard Deviations for the GAI, HADS-A, and RAID for Participants with (*n* = 20) and without (*n* = 160) a GAD Diagnosis, and the Total Sample (*n* = 180)

Scale	Met criteria for GAD (*n* = 20)	Did not meet criteria for GAD (*n* = 160)	Total sample (*n* = 180)
GAI	14.40 (5.09)[a]	3.22 (4.55)	4.46 (5.79)
HADS-A	9.95 (4.48)	3.13 (2.86)	3.88 (3.75)
RAID	22.30 (10.30)	8.26 (7.74)	9.82 (9.16)

Note: GAD = Generalised Anxiety Disorder; GAI = Geriatric Anxiety Inventory; HADS-A = Hospital Anxiety and Depression Scale – Anxiety Subscale; RAID = Rating Anxiety in Dementia Scale.

[a]Numbers in parentheses are standard deviations.

Table 7.3

Intercorrelations among scores on the GAI, HADS-A, and RAID

	GAI	HADS-A	RAID
GAI	-		
HADS-A	0.71**	-	
RAID	0.61**	0.54**	-

Note: GAI = Geriatric Anxiety Inventory; HADS-A = Hospital Anxiety and Depression Scale –

Anxiety Subscale; RAID = Rating Anxiety in Dementia Scale.

** *p* < 0.01

Diagonal segments are produced by ties.
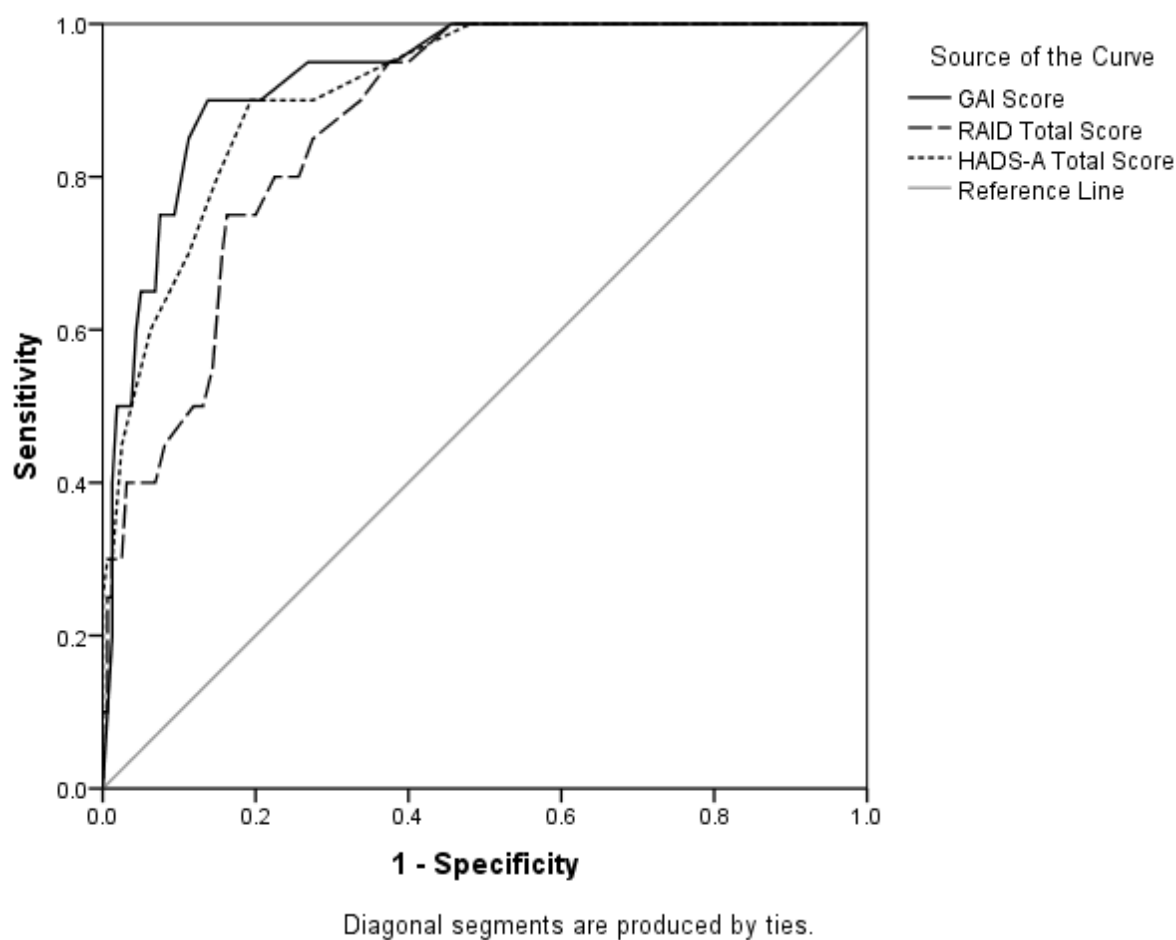
Figure 7.2. ROC Curves for GAI, HADS-A, and RAID with the DSM-5 Defined Diagnosis of

Generalized Anxiety Disorder as the Criterion

Note: GAI = Geriatric Anxiety Inventory; HADS-A = Hospital Anxiety and Depression Scale –

Anxiety Subscale; RAID = Rating Anxiety in Dementia Scale.

Table 7.4

AUCs for the GAI, RAID, and HADS-A in Detecting DSM-5 GAD for Participants With and Without Mild Cognitive Impairment (*N* = 180)

	AUC*	SE	95% CI
GAI			
MMSE 18-23 (*n* = 65)	.913	.054	.808-1.00
MMSE 24-30 (*n* = 115)	.946	.023	.900-.991
HADS-A			
MMSE 18-23 (*n* = 65)	.890	.049	.794-.987
MMSE 24-30 (*n* = 115)	.931	.032	.868-.994
RAID			
MMSE 18-23 (*n* = 65)	.846	.058	.733-.960
MMSE 24-30 (*n* = 115)	.879	.043	.795-.962

Note: AUC = Area under the curve; SE = Standard error; CI = Confidence interval; GAI = Geriatric Anxiety Inventory; MMSE = Mini-Mental State Examination; HADS-A = Hospital Anxiety and Depression Scale – Anxiety Subscale; RAID = Rating Anxiety in Dementia Scale.

*No significant differences in AUCs were found between participants with normal cognitive function and mild cognitive impairment.

Table 7.5

Overall Accuracy, Sensitivity, Specificity, Positive Predictive Value, Negative Predictive Value, and Likelihood Ratios for the GAI, HADS-A, and RAID at Various Cut-off Scores

Cut-off score	Accuracy (%)	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Youden 's Index (*J*)
GAI						
7	83.3	90.0	82.5	39.1	98.5	0.73
8	84.4	90.0	83.8	40.9	98.5	0.74
9	86.7	90.0	86.3	45.0	98.6	0.76
10	88.3	85.0	88.7	48.6	97.9	0.77
11	88.9	75.0	90.6	50.0	96.7	0.66
12	90.6	75.0	92.5	55.1	96.7	0.68
HADS-A						
6	81.7	90.0	80.6	36.7	98.5	0.71
7	84.4	80.0	85.0	40.0	97.1	0.65
8	86.7	70.0	88.7	43.8	96.0	0.59
9	90.0	60.0	93.7	54.6	94.9	0.54
10	91.7	45.0	97.5	69.2	93.4	0.43
11	91.1	30.0	98.8	75.0	91.9	0.29
RAID						
11	73.9	85.0	72.5	27.9	97.5	0.58
12	75.0	80.0	74.4	28.1	96.8	0.54
13	75.6	80.0	75.0	28.6	96.8	0.55
14	76.7	80.0	76.2	29.6	96.8	0.56
15	77.8	80.0	77.5	30.8	96.9	0.58
16	79.4	75.0	80.0	31.9	96.2	0.55
17	82.8	75.0	83.8	36.6	96.4	0.59

Note: PPV = Positive predictive value; NPV = Negative predictive value; GAI = Geriatric Anxiety Inventory; HADS-A = Hospital Anxiety and Depression Scale – Anxiety Subscale; RAID = Rating Anxiety in Dementia Scale.

7.3.   SUMMARY AND CONCLUSION

In this chapter, an empirical paper was presented which examined the reliability, validity, sensitivity and specificity of the GAI, HADS-A, and RAID, and identified an optimal cut-off score to detect GAD within an RACF sample. All three measures were found to have acceptable internal reliability and validity, with the RAID also found to have good inter-rater reliability for a sub-sample of aged care residents. Similarly, each measure detected GAD at greater than chance level, with all optimal cut-scores having good levels of sensitivity and specificity.

Although the abovementioned findings suggest all three measures are satisfactory in assessing and detecting GAD symptoms in RACF residents, the GAI appeared to be the most reliable and valid screening tool. Not only was this highlighted by its higher levels of internal reliability and concurrent validity, the GAI was also found to be significantly better at identifying GAD than the RAID, had the highest AUC, and had better overall accuracy, sensitivity, and specificity at its optimal cut-point of ≥9 when compared to those of the HADS-A and RAID. Thus, based on the findings of the paper, the GAI appeared to be the most suitable screening measure for GAD in RACF settings, with strong support for the use of a cut-off of 9/10. The GAI has also been found to have low administrative and respondent burden (as highlighted in review paper two which is provided in *Chapter three*). Together, these findings provide support for the routine use of the GAI in RACFs, which would enable aged care staff to easily and accurately identify residents experiencing generalised anxiety.

In the next chapter, the final empirical paper of the thesis is presented, which examines the correlates and factors associated with anxiety symptom severity in RACF residents. Given the limited research on how to best assess for and identify anxiety in RACFs and the overall under-reporting of this condition, it was considered important to identify which factors are associated with anxiety within the aged care context. Not only will this increase our understanding of anxiety in RACF residents, it will also help improve the detection of individuals who may be experiencing (or likely to experience) anxiety and provide potential targets for interventions.

DECLARATION BY CANDIDATE

In the case of Chapter eight, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Study conceptualisation, design, data collection, entry, and statistical analyses, and preparation of manuscript.	75

The following co-authors contributed to the work:

Name	Nature of contribution
Dr. Tanya Davison	Provided guidance on the study design and data collection, as well as consultation on the ideas expressed in the manuscript, the reading of drafts and provision of feedback and suggestions.
Professor David Kissane	Provided guidance on the study design and data collection, as well as consultation on the ideas expressed in the manuscript, the reading of drafts and provision of feedback and suggestions.

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work:

Candidate's Signature	███████████████	Date 15/01/2018

Main Supervisor's Signature	███████████████	Date 15/01/2018

CHAPTER EIGHT

THE FACTORS ASSOCIATED WITH ANXIETY SYMPTOM SEVERITY IN OLDER ADULTS LIVING IN NURSING HOMES AND OTHER RESIDENTIAL AGED CARE FACILITIES

8.1. PREAMBLE TO EMPIRICAL PAPER THREE

This chapter presents the third and final empirical paper of the thesis. Given the high prevalence of anxiety among RACF residents and overall under-detection and under-reporting of the condition by staff (as highlighted by the findings reported in *Chapter six*), it was considered important to gain a better understanding of the factors associated with anxiety within this population. As outlined in the review paper presented in *Chapter four*, our current limited understanding of the factors associated with anxiety in aged care settings has been largely provided by secondary analyses of data, with most correlates only being assessed by one or two studies. Thus, in an attempt to improve our knowledge and increase our ability to accurately detect residents who may be at-risk of experiencing anxiety, the paper presented in this chapter aimed to determine the correlates of anxiety symptoms within a sample of RACF residents. Based on the findings of the paper presented in *Chapter seven*, the GAI was used to assess anxiety symptoms within the sample.

The following paper is currently under review by the *Journal of Aging and Health*; a peer-reviewed journal with an impact factor of 2.168 (ISI Web of Science, 2017). As with all previous chapters, in the following paper all figures and tables have been renumbered to ensure consistency throughout the thesis. However, in accordance with Monash University's guidelines for a thesis including published works, the manuscript has been presented in the original publication format of the journal.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2018). *The factors associated with anxiety symptom severity in older adults living in nursing homes and other residential aged care facilities.* Manuscript submitted for publication.

Manuscript Title: The Factors Associated with Anxiety Symptom Severity in Older Adults Living in Nursing Homes and Other Residential Aged Care Facilities

Abstract

Objectives: This study aimed to identify the biopsychosocial factors associated with anxiety among a residential aged care sample.

Methods: A total of 178 residents (Mean age = 85.4 years (*SD* = 7.4 years)) with mild cognitive impairment or normal cognition participated. Participants completed the Geriatric Anxiety Inventory (GAI) and a set of measures assessing cognition, depression, self-perceived health, mastery, attachment, perceived social support, social engagement, functional status, the experience of a fall, and other negative life events.

Results: Unique correlates of GAI scores were depression, a preoccupied attachment style, lower mastery, cognitive impairment, and lower self-perceived health.

Discussion: Most correlates that were uniquely associated with anxiety had little to do with the current environment. More variance was accounted for by stable and life-long factors. This provides new insights into the characteristics of anxiety within aged care populations, and while preliminary, provides possible targets to prevent and treat anxiety within this setting.

Keywords: Anxiety, aged care, correlates, older adults, nursing home

Manuscript Title: The Factors Associated with Anxiety Symptom Severity in Older Adults Living in Nursing Homes and Other Residential Aged Care Facilities

Introduction

Anxiety is one of the most common psychiatric issues in later life (Gonçalves, Pachana, & Byrne, 2011) and is particularly prevalent among older adults living in residential aged care facilities (RACFs; also known as nursing homes, hostels, assisted-living facilities, and long-term care/residential homes). Specifically, prevalence rates of anxiety symptoms within RACFs are reported to range from 6.5% to 58.4% (see Creighton, Davison, & Kissane, 2015 for a review) and with our population rapidly ageing and people living longer than ever before (United Nations Population Fund, 2012), this issue is likely to increase considerably over the coming years.

Despite this, research on the risk factors and correlates of anxiety within RACF residents is only starting to emerge, with current knowledge primarily derived from community- and population-based elderly samples. Our limited understanding of the factors associated with late-life anxiety among RACF residents was highlighted in a review by Creighton, Davison, and Kissane (2016), where many studies were found to be secondary analyses of data. Nonetheless, the review indicated that factors such as female sex, younger age, higher educational level, lower functional ability, number of medical conditions, self-perceived health, level of cognitive impairment, depression, lower perceived social support, and the experience of negative life events have all been found to be associated with anxiety disorders or symptoms in RACF residents (Creighton et al., 2016). Although these findings are similar to the results of studies conducted with community-based elderly samples (e.g., Byers, Yaffe, Covinsky, Friedman, & Bruce, 2010; Gonçalves et al., 2011; Zhang et al., 2015), it is important to note that the majority of factors have only been assessed in one or two aged care studies, often with inconsistent results. Thus, many of the associations between anxiety and a number of factors within RACFs remain unclear.

However, given that many of the abovementioned variables are ubiquitous among RACF residents, it is possible that the presence of these factors contributes to the higher prevalence rate of anxiety within this setting. Further research is needed to determine if this is the case, with a simultaneous comparison of multiple factors also enabling us to determine which factors are most important in understanding anxiety among older adults in RACFs.

Compared to demographic and health-related variables, only a limited number of psychosocial factors associated with anxiety have previously been investigated within RACF samples. For instance, to date very little or no research has examined the association between anxiety and global attachment style, residents' sense of mastery (i.e., personal control and sense of competence in mastering one's day-to-day activities and environment), level of social engagement (i.e., having connections with others and being involved in group activities), or experience of a fall. Previous late-life research examining these variables have found significant associations between depression and lower levels of mastery (Davison, McCabe, Knight, & Mellor, 2012) and social engagement (Kang, 2012; Resnick, Fries, & Verbrugge, 1997) among RACF residents, while community-based studies have found an association between anxiety and the experience of a fall (Holloway et al., 2016; Menant et al., 2013) and an anxious attachment style (Kafetsios & Sideridis, 2006). Given that attachment behaviour continues throughout the lifespan and impacts on wellbeing (Bowlby, 1980), and RACF residents are at particular risk of low social engagement, low perceived mastery, and increased risk of falls, research examining these factors and their association with anxiety is warranted. Addressing this gap in knowledge is important, given that a number of these psychosocial variables are potentially modifiable and could therefore be used in prevention and intervention strategies aimed at reducing anxiety within this frail and growing population.

Thus, to further our current limited understanding of the factors associated with anxiety in RACFs, this study aimed to determine the correlates of anxiety symptoms among a sample of RACF residents using the biopsychosocial model as a framework. Specifically, demographic variables (age, sex, educational level, and marital status), biological/health-related variables (cognitive impairment, functional ability, number of physical health conditions, and self-perceived health), and psychosocial variables (perceived social support, social engagement, attachment style, mastery, depression, experience of negative life events, and experience of a recent fall) were all examined within this study. Given the conceptual overlap between anxiety and depression (Beekman et al., 2000; Schoevers, Beekman, Deeg, Jonker, & Van Tilburg, 2003) and the finding that depression is also a consequence of living with anxiety (Wetherell, Gatz, & Pedersen, 2001), a hierarchical regression analysis was conducted with depression entered at the first step. This then enabled the assessment of whether other biopsychosocial variables accounted for additional variance in self-rated anxiety.

Methods

Study Design

This study utilised a cross-sectional, observational design. Ethics approval was granted by the Monash University Human Research Ethics Committee (project number: CF14/3346–2014001779).

Participants

Between March 2015 and November 2016, residents were recruited from 12 randomly selected RACFs across southern and eastern metropolitan Melbourne. To be eligible to participate, residents had to: (1) be ≥ 65 years of age; (2) have resided at the RACF for a minimum of three months; and (3) scored ≥ 18 on the Mini-Mental State Examination (MMSE). Residents were excluded if they: (1) had a diagnosis of schizophrenia

or bipolar affective disorder; or (2) were unable to complete clinical assessments because of illness, medication, sensory or speech impairment, intellectual disability, or lack of language fluency. Figure 8.1 outlines participant recruitment with reasons for exclusion from the study and statistical analyses indicated.

[Figure 8.1 about here]

Measures

Anxiety. Anxiety symptoms were assessed using the Geriatric Anxiety Inventory (GAI; Pachana et al., 2007); a 20-item self-report measure of general anxiety symptoms in older adults over the past week. Using a dichotomous agree/disagree format to ensure ease of understanding, each item utilizes language commonly employed by older adults to describe anxiety and worry (e.g., "butterflies in my stomach"). Total scores range from 0 to 20, with higher scores indicating greater anxiety levels. Research examining the psychometric appropriateness of the GAI in RACF samples have reported excellent reliability and validity within this context (Boddice, Pachana, & Byrne, 2008; Gerolimatos, Gregg, & Edelstein, 2013). For the current sample, the GAI's Cronbach's alpha was found to be .94.

Demographic characteristics. Each participant's age, sex, marital status, and educational level (i.e., years of formal education) was derived from their file held at the facility. To ensure the accuracy of information, educational level and marital status was verbally confirmed with each participant during the interview.

Biological/health-related characteristics. Four health-related variables were assessed in the current study:

Cognitive impairment. Level of cognitive impairment was assessed using the MMSE (Folstein, Folstein, & McHugh, 1975); a commonly used, brief cognitive screening instrument comprising 11-items assessing orientation, memory recall, attention, language, comprehension, and visuospatial skills. Scores range from 0 to 30, with commonly accepted cut-off points being: 24-30 for normal cognition; 18-23 for mild cognitive impairment (MCI); and 0-17 for moderate to severe cognitive impairment (Tombaugh & McIntyre, 1992).

Presence and number of physical health conditions. To assess the number and type of chronic illnesses recorded in participants' files, the Functional Comorbidity Index (FCI; Groll, To, Bombardier, & Wright, 2005) was used. The FCI provides a sum of 18 predefined comorbid conditions (e.g., arthritis, stroke), with scores ranging from 0 to 18 (higher scores indicate greater comorbidity). In the present study, the FCI was used as a checklist, with the researcher (AC) examining participants' files and recording which conditions were present. The three items measuring anxiety, depression, and body mass index were excluded in this study, as anxiety was the outcome variable, depression was assessed using a diagnostic interview, and the ability to ascertain an accurate measurement of participants' current weight and height to calculate body mass index was considered unfeasible. Thus, a total of 15 comorbid conditions were assessed (with a possible maximum score of 15).

Activities of daily living (ADLs). The Katz Index of ADLs (Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963) was used to assess functional ability and participants' capacity to perform basic ADLs (e.g., bathing, dressing) independently. This measure was administered to an RACF staff member who was involved in the participant's care activities, and involved rating the participant as either fully independent or dependent across six skills. Total scores can range from 0 to 6, with a maximum score of six points indicating full independence, four points moderate impairment, and two points severe impairment. Overall, the psychometric properties of this index has been found to be good, with evidence of high

levels of reliability and validity in elderly populations (Arik et al., 2015; Brorsson & Asberg, 1984). In the current study, this measure had a Cronbach's alpha of .80.

Self-perceived health. Participants' subjective perception of their physical health was assessed via one-item ("How would you rate your overall health at the present time?"). Participants rated their current health using a 4-point Likert-type scale from 1 (poor) to 4 (excellent), with a higher rating indicating greater self-perceived health.

Psychosocial characteristics. A total of seven psychosocial variables were assessed within this study:

Social engagement. Participants' individual level of social engagement was assessed via the Revised Index for Social Engagement (RISE; Gerritsen et al., 2008). This observational scale consists of six dichotomous yes/no items and was specifically developed to measure positive features of RACF residents' social behaviour (e.g., "Does the resident accept invitations to most group activities?"). Scores range from 0 to 6, with higher scores representing greater social engagement. The RISE was completed with a staff member who was familiar with the resident and had worked closely with them for at least the previous two weeks. The RISE has been widely used to assess social engagement in RACFs among residents with cognitive impairment (e.g., de Boer, Hamer, Zwakhalen, Tan, & Verbeek, 2017; van Kooten et al., 2015). Cronbach's alpha for the scale within the present sample was found to be .80.

Perceived social support. Perceived social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). This self-report measure comprises 12 questions that assess perceptions of support from three sources: family (e.g., "I can talk about my problems with my family"), friends (e.g., "I can count on my friends when things go wrong"), and a significant other ("I have a special person who is a real source of comfort to me"). Each item is answered using a 7-

point Likert-type scale from 1 (very strong disagree) to 7 (very strongly agree). Total scores can range from 7 to 84, with higher scores indicating greater perceived social support. Good levels of reliability and validity for the MSPSS within older adult populations have been found (Stanley, Beck, & Zebb, 1998). In the present study, Cronbach's alpha for the total score of the MSPSS was .83.

Attachment style. Global attachment style was measured using the Experience in Close Relationships – Relationship Structures (ECR-RS) Adult Attachment Questionnaire (Fraley, Waller, & Brennan, 2000). This 9-item self-report measure was designed to assess two underlying global attachment patterns: avoidance (six items that assess discomfort with emotional closeness to and dependency on partners) and anxiety (three items that measure excessive worry and concern that a partner will not be available when support is needed). Each item is rated on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree), with two separate total scores for the avoidance and anxiety dimensions provided. Each subscale score ranges from 1 to 7, with low scores on both these dimensions reflecting attachment security, while higher scores represent higher attachment avoidance and anxiety, respectively. In the current study, participants were instructed to rate each item with respect to how they feel about "close relationships in general" to identify their general attachment style. Cronbach's alpha for the avoidant and anxiety attachment dimensions in the current sample were .58 and .75, respectively.

Mastery. The coping resource of perceived level of mastery (i.e., the extent to which an individual perceives they have control of events and ongoing situations) was assessed using Pearlin and Schooler's (1978) 7-item self-report scale. Each item is rated using a 4-point Likert-type scale from 1 (strongly disagree) to 4 (strongly agree). Total scores can range from 7 to 28, with higher scores indicating greater levels of mastery. In the current study Cronbach's alpha for the scale was .61.

Depression. The presence of a Major Depressive Disorder (MDD) was assessed

using the MINI-International Neuropsychiatric Interview version 7.0.0 (MINI; Sheehan et al.,

1998). The MINI is a structured clinical interview that generates diagnoses according to

DSM-5 (American Psychiatric Association [APA], 2013) criteria, and although it wasn't

specifically developed for older adults, it has been frequently used with both community

(e.g., Byrne et al., 2010; Cheung, Patrick, Sullivan, Cooray, & Chang, 2012) and RACF (e.g.,

Arvaniti et al., 2005; Dozeman et al., 2012; Pachana et al., 2007) samples.

The recent experience of negative life events. Based on the findings of previous

literature (e.g., Beekman et al., 1998, 2000; De Beurs et al., 2001), an eight-item

dichotomous (yes/no) scale was used to assess whether each participant had experienced

any of the following life events within the past 12 months: the death of a partner or family

member; partner or family member becoming ill; or conflict with partner, family member,

other RACF residents, or nursing staff. Total scores ranged from 0 to 8, with higher scores

indicating that the participant experienced more of the assessed life events within the past

year.

The eight events mentioned above were selected as they were likely to have

occurred recently, and have previously been found to be associated with the onset of

depression and anxiety in later-life (De Beurs et al., 2001). Other stressful life events found

to be associated with a reduction in wellbeing (e.g., change in financial state, being fired

from work, losing driver's license) were excluded as they were not considered relevant for

RACF residents.

The recent experience of a fall. Participants' experience of a fall within the last six

months was determined using a single dichotomous (yes/no) item ("Have you had a fall in

the last six months?").

Procedure

Using a random number generator, 19 RACFs were randomly selected from a list of

all facilities within southern and eastern metropolitan Melbourne, Australia, and invited to participate via phone call and email. Twelve facilities agreed to participate, including private companies, not-for-profit and religious organizations, and government funded facilities. Screening and identification of potential participants was completed with the assistance of the manager and/or director of nursing of each participating facility. Eligible residents were then approached by the first author (AC) and completed a process developed by Warner, McCarney, Griffin, Hill, and Fisher (2008) to determine their capacity to provide informed consent. If deemed able to provide informed consent, they were invited to participate in the study and sign the consent form. For those considered unable to provide consent themselves, the 'person responsible' was approached to provide written informed consent. The MMSE was then administered, with residents scoring <18 excluded from the study, as well as residents who met other exclusion criteria. All eligible participants were then administered all measures listed above in an interview format to ensure good understanding and comprehension of each item. Each participant's file held at the facility was also screened to obtain demographic and health-related information. Lastly, a staff member familiar with the participant was then approached and completed the RISE and Katz Index of Independence in ADLs in an interview-format with the researcher.

Statistical Analyses

Data were collated and analyzed using version 22 of the Statistical Package for the Social Sciences (SPSS). Descriptive statistics (proportions or means and standard deviations) were used to describe the demographic and clinical characteristics of the sample. Due to the exploratory nature of this study, the correlates of anxiety were investigated in two phases. In the first phase, bivariate correlations were conducted to determine which continuous variables were associated with scores on the GAI, with non-parametric Spearman correlations being used due to positive skewness on the GAI. The relationship between anxiety score and categorical variables were examined using Mann-Whitney U or

Kruskal-Wallis tests. In phase two, all variables which showed significance at an alpha of .05

were entered into a hierarchical multiple regression to determine which factors were most

closely associated with anxiety. The presence of an MDD diagnosis was entered as a first

step, with all other variables were then entered in a subsequent step to determine if they

accounted for any additional variance in anxiety scores.

Results

Sample Characteristics

A total of 180 residents completed the study, however two cases were excluded

from analysis. One case was a multivariate outlier (with Mahalanobis distance exceeding

$\chi^2(12) = 32.909$, $p < .001$), and one case had a standardised residual in excess of ±3.30;

indicating undue influence on the model (Tabachnick & Fidell, 2007). The study therefore

comprised 178 participants from 12 RACFs; 60 males and 118 females (M age = 85.4 years).

Table 8.1 provides an overview of the demographic and clinical characteristics of the final

sample.

[Table 8.1 about here]

Association of Self-Rated Anxiety with Biopsychosocial Variables

The association between anxiety symptoms, as measured by the GAI (Pachana et

al., 2007), and all variables across the six stages of the model were examined, with the

correlations presented in Table 8.2. Cognitive impairment, mastery, self-perceived health,

social engagement, negative life events, perceived social support and an anxious

attachment style were all found to be significantly correlated with GAI scores. Out of the

categorical variables, the presence of an MDD diagnosis, $z = -5.005$, $p < .001$, and the

experience of a fall, z = -3.838, p < .001 were both found to be significantly associated with higher GAI scores. No significant association was found between GAI score and sex, z = -.123, p = .902, or marital status, $\chi^2(4)$ = 7.947, p = .094.

[Table 8.2 about here]

To determine which factors had the strongest association with anxiety, those variables which were significantly associated with self-rated anxiety were entered into a hierarchical multiple regression. The presence/absence of an MDD diagnosis was entered at the first step, with social engagement, attachment, mastery, self-perceived health, perceived social support, cognitive impairment, the experience of negative life events within the past 12 months, and the experience of a fall within the past 6 months entered in a subsequent step. Although avoidant attachment was not significantly associated with GAI scores in the bivariate correlations, it was included in the regression as this allowed the two-dimensional model of attachment to be accurately represented, and enabled the results to be conceptually interpreted in accordance with Bartholomew and Horowitz's (1991) commonly used four attachment styles (secure, dismissive, fearful, and anxious/preoccupied) (Fraley, 2012).

The presence of an MDD diagnosis was significantly associated self-rated anxiety score, $F(1, 176)$ = 62.786, p < .001, explaining 26.30% of the variance in GAI scores (R^2 = .259). Entry of the remaining variables significantly increased the association with anxiety scores, $\Delta F(11, 165)$ = 6.226, p < .001, with the final model explaining 47.90% of the variance in GAI scores (R^2 = .479). The significant unique correlates in the final model were MDD diagnosis, attachment style, level of mastery, self-perceived health, and cognitive impairment (see Table 8.3). Life events, the experience of a fall, perceived social support,

and social engagement did not contribute unique variance in anxiety scores.

[Table 8.3 about here]

Discussion

The current study aimed to examine the relationship between self-rated anxiety and a range of demographic, health-related, and psychosocial variables. Using the biopsychosocial model as a framework, the overall model accounted for 47.9% of the total variance in anxiety scores, with the introduction of the psychosocial variables explaining an additional 21.60% after the effects of MDD were controlled for. Specifically, attachment style, lower levels of mastery, higher levels of cognitive impairment, and the perception that physical health was poor rather than excellent all made significant contributions to the model and were all strongly associated with higher levels of self-reported anxiety within the RACF sample.

Consistent with previous aged care research (e.g., Cheok, Snowdon, Miller, & Vaughan, 1996; Haugan, Innstrand, & Moksnes, 2013; Neville & Teri, 2011; Smalbrugge et al., 2005), MDD was found to have a strong and significant association with anxiety symptoms. Within the current sample, when all other variables were held constant, the predicted GAI score was 6.29 times greater for participants with an MDD diagnosis than for those without MDD. This came as no surprise, given the conceptual overlap between the conditions and the fact that anxiety has been found to be a significant precursor and perpetuating factor to depression (Wetherell et al., 2001). As suggested by Schoevers et al. (2003), the strong association found in this study might indicate that both disorders should be considered as different representations of the same disorder, rather than distinct diagnostic entities as defined by the DSM-5 (APA, 2013). Nonetheless, the confirmation of

the association between anxiety and depression within aged care residents is important, as the presence of depressive symptoms – which are typically more frequently assessed for within this context – could potentially be used by staff to alert them that a resident is at higher risk of also experiencing anxiety.

After controlling for the influence of MDD, both attachment dimensions were found to be significantly associated with anxiety. Specifically, the more anxious and less avoidant residents were with respect to their attachment style, the higher their levels of self-rated anxiety. This pattern of anxiety and avoidance indicates that high levels of anxiety were associated with a preoccupied attachment style, which is consistent with studies examining the association between anxiety and attachment in adult populations (e.g., Eng, Heimberg, Hart, Scheier, & Liebowitz, 2001; Fonagy et al., 1996). As an individual with a preoccupied attachment style is characterized by an excessive dependence and high need for approval from others, anxiety about rejection and abandonment, and a negative view of the self (Bartholomew & Horowitz, 1991), it is likely that this attachment style affects their self-belief in their ability to cope and adjust. Anxiety and feelings of insecurity are likely to be heightened for these individuals within an RACF environment; where there are significant barriers to forming meaningful relationships (Casey, Low, Jeon, & Brodaty, 2016), such as frequent shift changes, high rates of staff and resident turnover (Castle, 2006; Castle & Engberg, 2005), and an overemphasis on staff providing clinical services and completing documentation rather than nurturing social interactions (Walker & Paliadelis, 2016). Although further research within an aged care setting is needed to confirm these findings, this association aids in furthering our understanding of the characteristics of anxiety in aged care residents, and may also help with the development of more effective and personalized day-to-day care as well as anxiety interventions. For instance, the identification that a preoccupied attachment style may help staff identify residents who are at risk of anxiety and suggests that fostering a sense of acceptance of the residents and encouraging the

formation of social relationships in their new environment may help reduce anxiety symptoms.

The current findings indicated that perceived social support, social engagement, and the experience of negative, socially-oriented life events (e.g., death, illness, or conflict with their partner or family member) were not associated with anxiety when included in the multivariate model. Instead, the results suggest that longstanding factors (such as attachment style) are more strongly associated with anxiety. This suggests that rather than the social environment being the key contributing factor to the experience of anxiety in RACF settings, it appears some residents are predisposed to cope better or worse with the social changes associated with this stage of life (e.g., forming new relationships within the facility, and the experience of loved ones becoming sick or dying). Given that most previous research into anxiety in RACFs have examined only age-related (e.g., cognitive impairment) or current social/environmental factors (e.g., loneliness, social support) associated with anxiety (Drageset et al., 2013; Smalbrugge et al., 2005), further research investigating possible predisposing factors (such as attachment style) is needed.

A low level of mastery was found to have a significant independent association with anxiety; with residents who perceived they lacked control over their lives experiencing higher levels of anxiety. This is consistent with the findings reported by the only other RACF study to examine the association between mastery and anxiety (Keister, 2006), and is in line with previous research examining the relationship between environmental mastery and depression within this context (Davison et al., 2012; Knight, Davison, McCabe, & Mellor, 2011). The impact of an overall perceived lack of control on psychological wellbeing appears to be significant within RACFs and is likely heightened by the strict regimented routines and limited opportunity to ascribe control and choice over everyday issues (Hillcoat-Nallétamby, 2014; Kane et al., 1997). Thus, increasing perceived mastery by providing residents with an opportunity to be involved in decisions and accomplish small but achievable challenges

(e.g., physical exercise (Olsen, Telenius, Engedal, & Bergland, 2015)) may help increase a sense of control and empowerment and reduce anxiety within the aged care context.

With regards to health-related variables, both cognitive impairment and a lower level of self-perceived health were found to be independently associated with self-rated anxiety. Despite excluding residents with moderate to severe cognitive impairment, lower cognitive functioning was found to be independently associated with higher anxiety within the RACF sample, which is consistent with Parmelee, Katz, and Lawton (1993) and Zuidema, Derksen, Verhey, and Koopmans (2007). Although causal inferences cannot be made due to the cross-sectional nature of the study, it may be that residents with MCI still retain a level of insight and awareness of their decreasing cognitive function. However, increased anxiety may lead to or exacerbate poor cognitive performance. Although an association between anxiety and cognition has been consistently found in community-dwelling samples (Beaudreau & Ohara, 2008), some RACF studies have found either a positive relationship (Smalbrugge et al., 2005) or no significant association (Cheok et al., 1996; Neville & Teri, 2011) between cognitive function and anxiety. Given that over half of RACF residents have some level of cognitive dysfunction (Björk et al., 2016), prospective longitudinal research is needed to clarify the association between these two variables and help determine whether cognition is a potential risk factor for the development of anxiety.

While objective physical health (i.e., number of physical illnesses) had no association with anxiety, residents' perception that their health was poor (compared to excellent) was found to be significantly associated with higher levels of anxiety. Previous research in RACFs have found subjective health to be significantly poorer in residents with higher death anxiety (Moreno, Solana, Rico, & Fernandez, 2008-2009; Mullins & Lopez, 1982) and depression (Cummings, 2002), while worse self-rated health has been found to be significantly correlated with anxiety symptoms and disorders within community-dwelling elderly samples (Beekman et al., 1998; De Beurs et al., 2001; De Beurs, Beekman, Deeg, Van

Dyck, & Van Tilburg, 2000; De Beurs et al., 1999). The reasons for this association may be bidirectional; with poorer subjective health potentially leading to an increase in anxiety, and the presence of anxiety possibly leading to poorer perceptions of health. While further research is needed, this finding suggests that routine assessment of self-perceived health in RACF settings may be useful in identifying residents at risk of poor mental health. Additionally, interventions aimed at increasing residents' self-perceived health may help reduce anxiety and improve emotional wellbeing, particularly given that objective health status was not found to be a significant correlate.

Anxiety was not found to be associated with any demographic variables, functional ability, or the experience of a fall. While the finding that no significant relationship exists between demographic characteristics and anxiety is consistent with most previous RACF research (e.g., Baldacchino & Bonello, 2013; Drageset, Eide, & Ranhoff, 2013; Neville & Teri, 2011), for some variables the lack of a statistical finding may be due to lack of contrast. For example, functional impairment is a common reason for admission into RACFs (Gaugler, Duval, Anderson, & Kane, 2007), meaning that it may be somewhat 'normalized' within the aged care environment and therefore be less anxiety-inducing. However, the lack of a significant association between anxiety and more recent and age-related variables (e.g., reduced functional ability, as well as age itself) suggests that the experience of anxiety in RACFs may not be an acute response to factors specifically associated with older age or the nursing home setting, but instead is a chronic life-long condition that residents have had to cope with throughout their lives. This has been found to be the case for depression, with McSweeney and O'Connor (2008) finding that most RACF residents were depressed on entry. To date, no research has examined the trajectory of anxiety within this context, thus future studies examining the course of anxiety in newly admitted RACF residents using a prospective, longitudinal design are needed.

Study Limitations

There are a number of limitations of this study that warrant noting. First, while the exclusion of individuals with moderate and severe cognitive impairment was done to ensure included residents had the capacity to reliably understand and complete the measures, their omission from the sample limits the generalizability of the findings to the broader aged care population. Second, although the use of only one-item to assess self-perceived health is common in geriatric research (e.g., Chou, Mackenzie, Liang, & Sareen, 2011; De Beurs et al., 2001), this may be seen as a limitation due to the lack of detail provided. Third, it is important to note that the low Cronbach alphas for the measures assessing mastery and avoidant attachment may have impacted on the current findings and contributed to the lack of a significant association between mastery and anxiety in the regression analyses. Future research using these tools in a RACF sample should therefore attempt to ascertain their reliability through the completion of other reliability analyses (e.g., confirmatory factor analysis). Last, the study utilized a cross-sectional design, meaning that causal inferences cannot be made between anxiety and the factors assessed. Prospective longitudinal studies that utilize a large sample size and include residents with more severe levels of cognitive impairment would enable a more comprehensive understanding of the relationships between anxiety and biopsychosocial factors in RACF residents. Similarly, as our knowledge of the correlates of anxiety improves, it would also be helpful for future research to consider issues such as potential mediating factors. The current study ensured that a diagnosis of depression was entered as a first step in the hierarchical regression, and it would beneficial for future research to expand on this by taking other potential mediating factors into consideration.

Conclusion

In sum, findings from the current study highlight the importance that attachment style, mastery, self-perceived health, cognitive impairment, and depression have on the experience of anxiety among older RACF residents. Based on the results, the presence of

depression and/or a decline in cognitive functioning could be used by staff to identify

residents at risk of experiencing anxiety, while interventions or programs aimed at

enhancing mastery, self-perceived health, and increasing opportunities to build meaningful

relationships may help reduce the high anxiety rates within this growing frail and vulnerable

population.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association.

Arik, G., Varan, H. D., Yavuz, B. B., Karabulut, E., Kara, O., Kilic, M. K., . . . Cankurtaran, M. (2015). Validation of Katz index of independence in activities of daily living in Turkish older adults. *Archives of Gerontology and Geriatrics, 61*(3), 344-350. doi: https://doi.org/10.1016/j.archger.2015.08.019

Arvaniti, A., Livaditis, M., Kanioti, E., Davis, E., M., S., & Xenitidis, K. (2005). Mental health problems in the elderly in residential care in Greece - A pilot study. *Aging & Mental Health, 9*(2), 142-145. doi: 10.1080/13607860412331336869

Baldacchino, D. R., & Bonello, L. (2013). Anxiety and depression in care homes in Malta and Australia: Part 1. *British Journal of Nursing, 22*(12), 677-683.

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology, 61*(2), 226-244.

Beaudreau, S. A., & Ohara, R. (2008). Late-life anxiety and cognitive impairment: A review. *American Journal of Geriatric Psychiatry, 16*(10), 790-803. doi: 10.1097/JGP.0b013e31817945c3

Beekman, A. T. F., Bremmer, M. A., Deeg, D. J. H., Van Balkom, A. J. L. M., Smit, J. H., De Beurs, E., . . . Van Tilburg, W. (1998). Anxiety disorders in later life: A report from the longitudinal aging study Amsterdam. *International Journal of Geriatric Psychiatry, 13*(10), 717-726. doi: 10.1002/(SICI)1099-1166(1998100)13:10<717::AID-GPS857>3.0.CO;2-M

Beekman, A. T. F., De Beurs, E., Van Balkom, A. J. L. M., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (2000). Anxiety and depression in later life: Co-occurrence and communality of risk factors. *American Journal of Psychiatry, 157*(1), 89-95.

Björk, S., Juthberg, C., Lindkvist, M., Wimo, A., Sandman, P., Winblad, B., & Edvardsson, D.

(2016). Exploring the prevalence and variance of cognitive impairment, pain, neuropsychiatric symptoms and ADL dependency among persons living in nursing homes; a cross-sectional study. *BMC Geriatrics, 16*(154). doi: 10.1186/s12877-016-0328-9

Boddice, G., Pachana, N. A., & Byrne, G. J. (2008). The clinical utility of the geriatric anxiety inventory in older adults with cognitive impairment. *Nursing Older People, 20*(8), 36-39; quiz 40. doi: https://dx.doi.org/10.7748/nop2008.10.20.8.36.c6809Bowlby, J. (1980). *Attachment and loss: Loss, sadness and depression* (Vol. 3). New York, NY: Basic Books.

Brorsson, B., & Asberg, K. H. (1984). Katz index of independence in ADL. Reliability and validity in short-term care. *Scand J Rehabil Med, 16*(3), 125-132.

Byers, A. L., Yaffe, K., Covinsky, K. E., Friedman, M. B., & Bruce, M. L. (2010). High occurrence of mood and anxiety disorders among older adults: The National Comorbidity Survey Replication. *Archives of General Psychiatry, 67*(5), 489-496. doi: 10.1001/archgenpsychiatry.2010.35

Byrne, G. J., Pachana, N. A., Goncalves, D. C., Arnold, E., King, R., & Keat Khoo, S. (2010). Psychometric properties and health correlates of the Geriatric Anxiety Inventory in Australian community-residing older women. *Aging and Mental Health, 14*(3), 247-254. doi: 10.1080/13607861003587628

Casey, A.-N. S., Low, L.-F., Jeon, Y.-H., & Brodaty, H. (2016). Residents Perceptions of Friendship and Positive Social Networks Within a Nursing Home. *The Gerontologist, 56*(5), 855-867. doi: 10.1093/geront/gnv146

Castle, N. G. (2006). Measuring staff turnover in nursing homes. *Gerontologist, 46*(2), 210-219.

Castle, N. G., & Engberg, J. (2005). Staff turnover and quality of care in nursing homes. *Med Care, 43*(6), 616-626.

Cheok, A., Snowdon, J., Miller, R., & Vaughan, R. (1996). Prevalence of anxiety disorders in

nursing homes. *International Journal of Geriatric Psychiatry, 11*(5), 405-410. doi:

10.1002/(SICI)1099-1166(199605)11:5<405::AID-GPS302>3.0.CO;2-O

Cheung, G., Patrick, C., Sullivan, G., Cooray, M., & Chang, C. L. (2012). Sensitivity and

specificity of the Geriatric Anxiety Inventory and the Hospital Anxiety and

Depression Scale in the detection of anxiety disorders in older people with chronic

obstructive pulmonary disease. *International Psychogeriatrics, 24*(1), 128-136. doi:

10.1017/S1041610211001426

Chou, K. L., Mackenzie, C. S., Liang, K., & Sareen, J. (2011). Three-year incidence and

predictors of first-onset of DSM-IV mood, anxiety, and substance use disorders in

older adults: Results from wave 2 of the national epidemiologic survey on alcohol

and related conditions. *Journal of Clinical Psychiatry, 72*(2), 144-155. doi:

10.4088/JCP.09m05618gry

Creighton, A. S., Davison, T., & Kissane, D. W. (2016). The correlates of anxiety among older

adults in nursing homes and other residential aged care facilities: a systematic

review. *International Journal of Geriatric Psychiatry, 32*(2), 141-154.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2015). The prevalence of anxiety among

older adults in nursing homes and other residential aged care facilities: a systematic

review. *International Journal of Geriatric Psychiatry, 31*(6), 555-566. doi:

10.1002/gps.4378

Cummings, S. M. (2002). Predictors of psychological well-being among assisted-living

residents. *Health and Social Work, 27*(4), 293-302.

Davison, T. E., McCabe, M. P., Knight, T., & Mellor, D. (2012). Biopsychosocial factors related

to depression in aged care residents. *Journal of Affective Disorders, 142*(1-3), 290-

296.

De Beurs, E., Beekman, A., Geerlings, S., Deeg, D., Van Dyck, R., & Van Tilburg, W. (2001).

On becoming depressed or anxious in late life: Similar vulnerability factors but

different effects of stressful life events. *British Journal of Psychiatry, 179*(NOV.),

426-431. doi: 10.1192/bjp.179.5.426

De Beurs, E., Beekman, A. T. F., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (2000). Predictors of change in anxiety symptoms of older persons: Results from the Longitudinal Aging Study Amsterdam. *Psychological Medicine, 30*(3), 515-527. doi: 10.1017/S0033291799001956

De Beurs, E., Beekman, A. T. F., Van Balkom, A. J. L. M., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (1999). Consequences of anxiety in older persons: Its effect on disability, well-being and use of health services. *Psychological Medicine, 29*(3), 583-593. doi: 10.1017/S0033291799008351

de Boer, B., Hamers, J. P. H., Zwakhalen, S. M. G., Tan, F. E. S., & Verbeek, H. (2017). Quality of care and quality of life of people with dementia living at green care farms: a cross-sectional study. *BMC Geriatrics, 17*(1), 155. doi: 10.1186/s12877-017-0550-0

Dozeman, E., Van Marwijk, H. W. J., Van Schaik, D. J. F., Smit, F., Stek, M. L., Van Der Horst, H. E., . . . Beekman, A. T. F. (2012). Contradictory effects for prevention of depression and anxiety in residents in homes for the elderly: A pragmatic randomized controlled trial. *International Psychogeriatrics, 24*(8), 1242-1251. doi: 10.1017/S1041610212000178

Drageset, J., Eide, G. E., & Ranhoff, A. H. (2013). Anxiety and depression among nursing home residents without cognitive impairment. *Scandinavian Journal of Caring Sciences, 27*(4), 872-881. doi: 10.1111/j.1471-6712.2012.01095.x

Eng, W., Heimberg, R. G., Hart, T. A., Scheier, F. R., & Liebowitz, M. R. (2001). Attachment in individuals with social anxiety disorder: The relationship among adult attachment styles, social anxiety, and depression. *Emotion, 1*(4), 365-380.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12*(3), 189-198.

Fonagy, P., Leigh, T., Steele, M., Steele, H., Kennedy, R., Mattoon, G., . . . Gerber, A. (1996).

The relation of attachment status, psychiatric classification, and response to psychotherapy. *Journal of Consulting and Clinical Psychology, 64*(1), 22-31. doi: 10.1037/0022-006X.64.1.22

Fraley, R. C. (2012). Information on the Experiences in Close Relationships-Revised (ECR-R) Adult Attachment Questionnaire. Retrieved 19th September 2017, from http://internal.psychology.illinois.edu/~rcfraley/measures/ecrr.htm

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item-response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology, 78*(2), 350-365.

Gaugler, J. E., Duval, S., Anderson, K. A., & Kane, R. L. (2007). Predicting nursing home admission in the U.S: A meta-analysis. *BMC Geriatrics, 7*. doi: 10.1186/1471-2318-7-13

Gerritsen, D. L., Steverink, N., Frijters, D. H. M., Hirdes, J. P., Ooms, M. E., & Ribbe, M. W. (2008). A revised index for social engagement for long-term care. *Journal of Gerontological Nursing, 34*(4), 40-48.

Gerolimatos, L. A., Gregg, J. J., & Edelstein, B. A. (2013). Assessment of anxiety in long-term care: Examination of the Geriatric Anxiety Inventory (GAI) and its short form. *International Psychogeriatrics, 25*(9), 1533-1542. doi: 10.1017/S1041610213000847

Gonçalves, D. C., Pachana, N. A., & Byrne, G. J. (2011). Prevalence and correlates of generalized anxiety disorder among older adults in the Australian National Survey of Mental Health and Well-Being. *Journal of Affective Disorders, 132*(1–2), 223-230. doi: http://dx.doi.org/10.1016/j.jad.2011.02.023

Groll, D. L., To, T., Bombardier, C., & Wright, J. G. (2005). The development of a comorbidity index with physical function as the outcome. *Journal of Clinical Epidemiology, 58*(6), 595-602.

Haugan, G., Innstrand, S. T., & Moksnes, U. K. (2013). The effect of nurse-patient interaction on anxiety and depression in cognitively intact nursing home patients. *Journal of*

Clinical Nursing, 22(15-16), 2192-2205. doi: 10.1111/jocn.12072

Hillcoat-Nallétamby, S. (2014). The meaning of "independence" for older people in different

residential settings. *The Journals of Gerontology: Series B, 69*(3), 419-430. doi:

10.1093/geronb/gbu008

Holloway, K. L., Williams, L. J., Brennan-Olsen, S. L., Morse, A. G., Kotowicz, M. A.,

Nicholson, G. C., & Pasco, J. A. (2016). Anxiety disorders and falls among older

adults. *Journal of Affective Disorders, 205*(Supplement C), 20-27. doi:

https://doi.org/10.1016/j.jad.2016.06.052

Kafetsios, K., & Sideridis, G. S. (2006). Attachment, social support, and well-being in young

and older adults. *Journal of Health Psychology, 11*(6), 863-875.

Kane, R. A., Caplan, A. L., Urv-Wong, E. K., Freeman, I. C., Aroskar, M. A., & Finch, M. (1997).

Everyday matters in the lives of nursing home residents: Wish for and perception of

choice and control. *Journal of the American Geriatrics Society, 45*(9), 1086-1093.

doi: 10.1111/j.1532-5415.1997.tb05971.x

Kang, H. (2012). Correlates of social engagement in nursing home residents with dementia.

Asian Nursing Research, 6(2), 75-81. doi: 10.1016/j.anr.2012.05.006

Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies of illness

in the aged. The index of ADL: A standardized measure of biological and

psychosocial function. *Journal of American Medical Association, 185*(12), 914-919.

doi: 10.1001/jama.1963.03060120024016

Keister, K. J. (2006). Predictors of self-assessed health, anxiety, and depressive symptoms in

nursing home residents at week 1 postrelocation. *Journal of Aging and Health,*

18(5), 722-742. doi: 10.1177/0898264306293265

Knight, T., Davison, T. E., McCabe, M. P., & Mellor, D. (2011). Environmental mastery and

depression in older adults in residential care. *Ageing and Society, 31*(5), 870-884.

doi: 10.1017/S0144686X1000142X

McSweeney, K., & O'Connor, D. W. (2008). Depression among newly admitted Australian

nursing home residents. *International Psychogeriatrics, 20*(4), 724-737. doi: 10.1017/S104161020800700X

Menant, J. C., Wong, A., Sturnieks, D. L., Close, J. C. T., Delbaere, K., Sachdev, P. S., . . . Lord, S. R. (2013). Pain and anxiety mediate the relationship between dizziness and falls in older people. *Journal of the American Geriatrics Society, 61*(3), 423-428. doi: 10.1111/jgs.12131

Moreno, R. P., Solana, E. I., Rico, M. A., & Fernandez, L. M. L. (2008-2009). Death anxiety in institutionalized and non-institutionalized elderly people in Spain. *Omega, 58*(1), 61-76.

Mullins, L. C., & Lopez, M. A. (1982). Death anxiety among nursing home residents: a comparison of the young-old and the old-old. *Death Education, 6*(1), 75-86. doi: 10.1080/07481188208252117

Neville, C., & Teri, L. (2011). Anxiety, anxiety symptoms, and associations among older people with dementia in assisted-living facilities. *International Journal of Mental Health Nursing, 20*(3), 195-201. doi: 10.1111/j.1447-0349.2010.00724.x

Olsen, C. F., Telenius, E. W., Engedal, K., & Bergland, A. (2015). Increased self-efficacy: the experience of high-intensity exercise of nursing home residents with dementia – a qualitative study. *BMC Health Serv Res, 15*(1), 379. doi: 10.1186/s12913-015-1041-7

Pachana, N. A., Byrne, G. J., Siddle, H., Koloski, N., Harley, E., & Arnold, E. (2007). Development and validation of the Geriatric Anxiety Inventory. *International Psychogeriatrics, 19*(1), 103-114. doi: 10.1017/S1041610206003504

Parmelee, P. A., Katz, I. R., & Lawton, M. P. (1993). Anxiety and its association with depression among institutionalized elderly. *American Journal of Geriatric Psychiatry, 1*(1), 46-58.

Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19*(1), 2-21.

Resnick, H. E., Fries, B. E., & Verbrugge, L. M. (1997). Windows to their world: The effect of

sensory impairments on social engagaement and activity time in nursing home residents. *The Journals of Gerontology, Series B: Psychological Sciences & Social Sciences, 52*(3), S135-S144.

Schoevers, R. A., Beekman, A. T. F., Deeg, D. J. H., Jonker, C., & Van Tilburg, W. (2003). Comorbidity and risk-patterns of depression, generalised anxiety disorder and mixed anxiety-depression in later life: Results from the AMSTEL study. *International Journal of Geriatric Psychiatry, 18*(11), 994-1001. doi: 10.1002/gps.1001

Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., . . . Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-1. *Journal of Clinical Psychiatry, 59*(Suppl. 20), 22-33.

Smalbrugge, M., Pot, A. M., Jongenelis, K., Beekman, A. T. F., & Eefsting, J. A. (2005). Prevalence and correlates of anxiety among nursing home patients. *Journal of Affective Disorders, 88*(2), 145-153. doi: 10.1016/j.jad.2005.06.006

Stanley, M. A., Beck, J. G., & Zebb, B. J. (1998). Psychometric properties of the MSPSS in older adults. *Aging and Mental Health, 2*(3), 186-193. doi: 10.1080/13607869856669

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th ed.). Boston, MA: Pearson Education, Inc.

Tombaugh, T. N., & McIntyre, N. J. (1992). The mini-mental state examination: a comprehensive review. *Journal of the American Geriatrics Society, 40*(9), 922-935.

United Nations Population Fund. (2012). *Ageing in the Twenty-First Century: A Celebration and a Challenge*. New York, NY.

van Kooten, J., Delwel, S., Binnekade, T. T., Smalbrugge, M., van der Wouden, J. C., Perez, R. S., . . . Scherder, E. J. (2015). Pain in dementia: prevalence and associated factors: protocol of a multidisciplinary study. *BMC Geriatrics, 15*, 29. doi: 10.1186/s12877-015-0025-0

Vink, D., Aartsen, M. J., Comijs, H. C., Heymans, M. W., Penninx, B. W. J. H., Stek, M. L., . . .

Beekman, A. T. F. (2009). Onset of anxiety and depression in the aging population:

Comparison of risk factors in a 9-year prospective study. *American Journal of

Geriatric Psychiatry, 17*(8), 642-652. doi: 10.1097/JGP.0b013e3181a65228

Walker, H., & Paliadelis, P. (2016). Older peoples' experiences of living in a residential aged

care facility in Australia. *Australasian Journal on Ageing, 35*(3), E6-E10. doi:

10.1111/ajag.12325

Warner, J., McCarney, R., Griffin, M., Hill, K., & Fisher, P. (2008). Participation in dementia

research: Rates and correlates of capacity to give informed consent. *Journal of

Medical Ethics, 34*(3), 167-170. doi: 10.1136/jme.2006.019786

Wetherell, J. L., Gatz, M., & Pedersen, N. L. (2001). A longitudinal analysis of anxiety and

depressive symptoms. *Psychology and Aging, 16*(2), 187-195. doi: 10.1037//0882-

7974.16.2.187

Zhang, X., Norton, J., Carrière, I., Ritchie, K., Chaudieu, I., & Ancelin, M. L. (2015).

Generalized anxiety in community-dwelling elderly: Prevalence and clinical

characteristics. *Journal of Affective Disorders, 172*, 24-29. doi:

10.1016/j.jad.2014.09.036

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale

of perceived social support. *Journal of Personality Assessment, 52*(1), 30-41.

Zuidema, S. U., Derksen, E., Verhey, F. R. J., & Koopmans, R. T. C. M. (2007). Prevalence of

neuropsychiatric symptoms in a large sample of Dutch nursing home patients with

dementia. *International Journal of Geriatric Psychiatry, 22*(7), 632-638. doi:

10.1002/gps.1722

Screened

(n = 919 from 12 RACFs)

Ineligible

(n = 494)

- Severe cognitive impairment (n = 236)
- Not fluent in English (n = 78)
- Unable to hold a clear conversation (n = 71)
- Resided at RACF <3 months (n = 52)
- Diagnosis of schizophrenia, intellectual disability and/or bipolar affective disorder (n = 47)
- <65 years of age (n = 9)
- Not approached as requested by staff (n =1)

Eligible and approached

(n = 425)

Did not participate (n = 245)

- Resident refused or 'person responsible' did not provide consent (n = 119)
- Too cognitively impaired (n = 74)
- Resident passed away before being interviewed (n = 21)
- Too physically ill (n = 10)
- Too hard of hearing (n = 8)
- Resident was unavailable to be interviewed during visits (n = 8)
- Unable to hold conversation (n = 4)
- Not fluent in English (n = 1)

Completed study

(n = 180)

Not included in analyses
(n = 2)

- Multivariate outlier (n = 1)
- Standardised residual > 3.30 (n = 1)
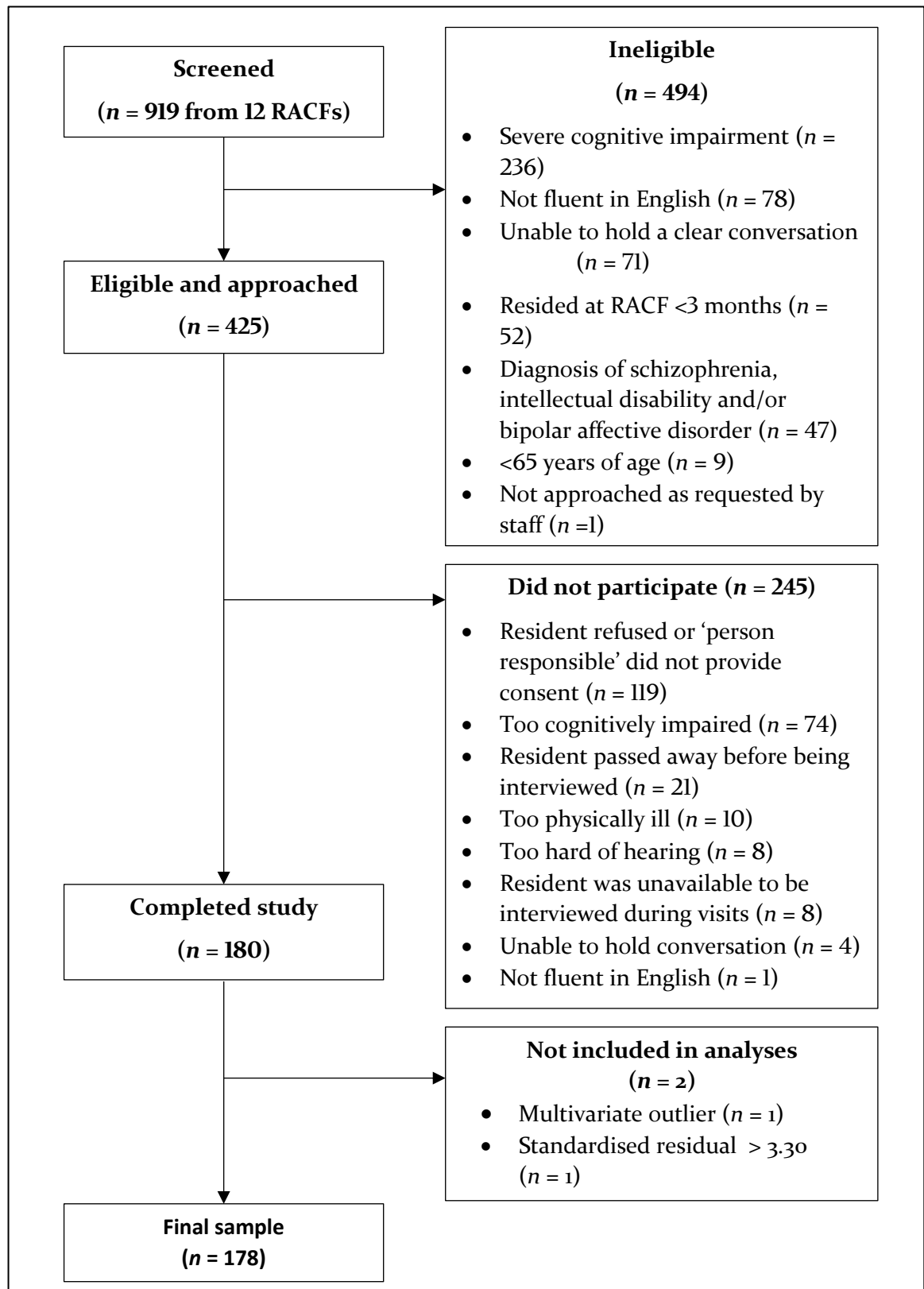
Final sample
(n = 178)

Figure 8.1. Participant recruitment flowchart.

Table 8.1

Demographic and Clinical Characteristics of the Sample (N = 178)

Characteristic	N	%	Mean	SD	Range
Age (years)			85.4	7.4	66-101
Sex					
Male	60	33.7			
Female	118	66.3			
Years of education			10.7	3.3	1-22
Marital status					
Widowed	94	52.8			
Divorced/separated	36	20.2			
Married	34	19.1			
Never married/single	12	6.7			
Other	2	1.1			
Length of stay at RACF (years)			2.6	2.5	0.2-12.6
Social engagement (RISE score)			4.0	1.9	0-6
Cognitive functioning (MMSE score)			24.7	3.6	18-30
Mild impairment (18-23)	64	36.0			
No impairment (24-30)	114	64.0			
Number of physical illnesses (FCI score)			3.6	1.7	0-10
Functional impairment (Katz Index of ADLs score)			3.5	1.9	0-6
Self-perceived health ("How would you rate your overall health at the present time?")	13	7.3			
Excellent	84	47.2			
Good	55	30.9			
Fair	26	14.6			
Poor					
Global attachment (ECR-RS score)					
Anxious attachment			2.9	1.3	1-7
Avoidant attachment			4.0	1.1	1-7
Perceived social support (MSPSS score)			62.0	11.7	25-84
Mastery			17.5	3.9	8-28

Table 8.1 (Continued)

Characteristic	*N*	%	Mean	*SD*	Range
Number of negative life events experienced in past 12 months			1.1	1.1	0-4
Family member became ill[a]	47	26.4			
Death of a family member[a]	38	21.3			
Conflict with RACF staff[a]	34	19.1			
Conflict with a family member[a]	24	13.5			
Conflict with other residents[a]	22	12.4			
Partner became ill[a]	16	9.0			
Death of partner[a]	10	5.6			
Conflict with partner[a]	4	2.2			
Experienced a fall in last 6 months					
Yes	49	27.5			
No	129	72.5			
MDD diagnosis					
Yes	15	8.4			
No	163	91.6			
Anxiety (GAI score)			4.4	5.7	0-20

Note. SD = standard deviation; RACF = residential aged care facility; RISE = Revised Index for Social Engagement.

[a]Count and percentages provided are of those participants who had experienced the life event in the last 12 months.

Table 8.2

Spearman Correlations of Self-Rated Anxiety and Continuous Health-Related and Psychosocial Variables

Variables	Self-rated anxiety (r_s)
Demographics	
Years of education	-.13
Age (years)	-.04
Health-related variables	
Self-perceived health	-.32**
Cognitive impairment	-.16*
Number of physical illnesses	-.02
Functioning in basic ADLs	.07
Psychosocial variables	
Anxious attachment	.42**
Mastery	-.39**
Social engagement	-.18*
Perceived social support	-.18*
Experience of negative life events in the last 12 months	.18*
Avoidant attachment	-.07

* $p < .05$

** $p < .01$

Table 8.3

Hierarchical Multiple Regression Analysis for Variables Predicting GAI score (N = 178)

Variables	Model 1			Model 2		
	B	**β**	*sr²*	**B**	**β**	*sr²*
Health-related variables						
Cognitive impairment				-.31	-.20**	.033
Self-perceived health						
Excellent vs. poor				-3.55	-.16*	.016
Good vs. poor				-1.50	-.13	
Fair vs. poor				-.87	-.07	
Psychosocial variables						
Anxious attachment				1.19	.27***	.053
Avoidant attachment				-.69	-.13*	.013
Mastery				-.24	-.16*	.019
Social engagement				.12	.04	
Perceived social support				-.04	-.08	
Experience of negative life events in last 12 months				.33	.06	
Experience of a fall in the last 6 months				1.09	.09	
MDD diagnosis	10.49	.51***	.26	6.29	.31***	.073
R^2		.263			.479	
Adjusted R^2		.259			.441	
F		62.79***			12.65***	
ΔR^2					.216	
					6.23***	
ΔF						

Note. Ratings of self-perceived health were represented as three dummy variables, with poor self-perceived health serving as the reference group.

* $p < .05$

** $p < .01$

*** $p < .001$

8.3.   SUMMARY AND CONCLUSION

In this chapter, a paper was presented which examined a range of biopsychosocial correlates of anxiety in RACF residents. The overall model predicted nearly half (47.9%) of the total variance in anxiety scores on the GAI, with level of cognitive impairment, self-perceived health, attachment style, mastery, social engagement, perceived social support, the experience of a negative life event(s) and/or a fall all accounting for an additional 21.6% after the effects of MDD were controlled for.

Significant individual predictors included the presence of MDD, a low avoidant and highly anxious attachment style, lower levels of mastery, poor self-perceived health, and increased cognitive impairment. These overall findings are similar to previous aged care studies (e.g., Keister, 2006; Neville & Teri, 2011; Smalbrugge, Pot, et al., 2005; Zuidema et al., 2007); however, this paper is the first to highlight the influence that longstanding factors (such as attachment) have on the experience of anxiety in RACFs, particularly when compared to the more comprehensively studied social factors (e.g., social support, social engagement). Although more research is needed, the findings suggest that the presence of MDD, cognitive impairment, and a highly anxious attachment style could be used by aged care staff to detect residents who may be at risk of experiencing anxiety, while increasing mastery and self-perceived health, and encouraging the fostering of meaningful relationships may help in preventing and reducing the rates of anxiety among RACF residents.

This paper was the final empirical paper of the thesis. In the following and final chapter, a general integrated discussion of the research findings is provided.

CHAPTER NINE

INTEGRATED GENERAL DISCUSSION

9.1.   INTRODUCTION

This final chapter provides a brief reiteration of the rationale and aims of the thesis, and presents an integrative synthesis of the findings and clinical relevance of the three empirical studies described in the preceding chapters. In the first section, a summary of the thesis aims is provided. Next, an overview of the main findings of each research aim is presented, with a synthesis of the overall findings given. The strengths and limitations of the findings are then outlined, followed by the theoretical, research, and clinical implications of the results. This chapter then concludes with a discussion of recommended future research directions and concluding remarks.

Please note that in this summary of the thesis findings, there is some inevitable repetition of the Discussion sections of the research papers. However, the purpose of this chapter is to provide an integrative and expanded summary of the overall findings presented in the preceding chapters.

9.2.   SUMMARY OF THESIS AIMS

This thesis presented research findings related to the prevalence, correlates, and assessment of anxiety in elderly RACF residents, with the overall aim of addressing the significant gap in the literature in relation to our knowledge and understanding of anxiety within RACFs. Specifically, while a number of community-based studies have investigated the prevalence and correlates of anxiety symptoms and disorders (e.g., Beekman et al., 1998; Beekman et al., 2000; Forlani et al., 2014; Gum et al., 2009; Losada et al., 2014; Vink et al., 2008) and examined the psychometric properties of a range of anxiety assessment measures in elderly adults (e.g., Byrne et al., 2010; Therrien & Hunsley, 2012), little is known about this condition in aged care settings. With the RACF population growing at an unprecedented rate (Deloitte Access Economics, 2016), and anxiety being found to be one of the most common psychiatric conditions in later life (Gonçalves et al., 2011; Trollor et al., 2007), it was considered vital to gain a better understanding of the prevalence, correlates, recognition, and management rates of anxiety within RACFs, as well as identify an accurate screening measure for this condition. This was considered particularly important in aged care settings as psychiatric conditions commonly precipitate admission to aged care facilities (Allen et al., 1992; Luppa et al., 2010) and anxiety can have a pervasive negative impact on health and wellbeing (Smalbrugge, Pot, et al., 2006).

Therefore, to help improve our understanding of anxiety within RACFs, the

current thesis aimed to examine the prevalence, correlates, recognition and management of anxiety among older adults living in RACFs, as well as determine the clinical utility of the most commonly used measures in detecting anxiety within an aged care population. These aims were addressed through the completion of three systematic reviews and three empirical studies investigating the prevalence of anxiety disorders and symptoms (*Chapters two and six*), the psychometric properties of commonly used anxiety measures (*Chapters three and seven*), and the correlates of anxiety symptoms (*Chapters four and eight*) within RACF residents.

9.3. OVERVIEW AND SYNTHESIS OF MAIN FINDINGS

As reported in *Chapter two*, a systematic review authored by Creighton et al. (2015) found that previous aged care research reported the prevalence of anxiety disorders and symptoms to range from 3.2% to 20.0% and 6.5% to 58.4%, respectively, with GAD and specific phobia appearing to be the most common specific anxiety disorders. This highlights the fact that the experience of anxiety is a common occurrence within RACFs – particularly when compared to community-based older adults (where anxiety disorders and symptoms are thought to range from 1.4% (Copeland et al., 1987) to 17.1% (Kirmizioglu et al., 2009) and 4.7% (Almeida et al., 2012) to 24.4% (Forsell & Winblad, 1998), respectively). Notably, the review found a number of limitations of the literature that influence the generalizability and interpretability of these findings. These included: the overall lack of attention paid to this clinical issue, as only 18 studies were found to have examined the prevalence of anxiety in RACFs despite a rigorous search of the literature; the use of outdated diagnostic criteria; the wide discrepancy across studies in reported prevalence rates, operationalization of anxiety, and specific anxiety disorders included in the assessments; and overall poor methodological quality. Ultimately, this review contributed to the literature by demonstrating the high rates of anxiety experienced by RACF residents, and highlighted the need for methodologically sound research into the current cohort of older adults that uses contemporary diagnostic criteria. This review also provided strong justification for a detailed investigation into the prevalence of anxiety among aged care residents.

Given the reported high prevalence rate of anxiety among elderly RACF residents found in the review, it was considered important to identify which measures were being used within this context and determine their psychometric appropriateness and clinical utility within this setting. As presented in *Chapter three*, a review authored

by Creighton et al. (2017) examined the literature and found substantial variability with regards to the measures used; with 22 different tools being used across 50 studies. This inconsistency highlights the lack of consensus with regards to the most suitable anxiety measure for an RACF population, which is likely due to the dearth of literature examining the psychometric properties of assessment tools within aged care settings. Specifically, of the four most commonly used measures (RAID, GAI, HADS-A, and STAI), only two (RAID and GAI) were specifically developed for older adults and existing data into the psychometric properties of the RAID, GAI, HADS-A and STAI within RACFs were derived from only one or two published studies. Out of the four measures the GAI appeared to have the most psychometric support for its use within aged care settings. However, the generalizability of the findings are considerably limited due to the lack of studies conducted and the small sample sizes used across studies. Overall, the findings of this review contributed to the literature by collating and critically analyzing current research into the psychometric properties of commonly used measures in RACFs. In doing so, we identified a significant gap in our knowledge with regards to which anxiety measure was most appropriate for the growing and frail aged care population, thereby providing a justification for a detailed examination of the psychometric properties of frequently used anxiety tools within this setting. Moreover, the review determined that there was limited research into the sensitivity, specificity, and appropriate cut-off scores of these measures for aged care residents, with those that had been conducted (e.g., for the RAID (Goyal et al., 2016) and GAI (Gerolimatos et al., 2013)) not utilizing a gold-standard diagnostic measure as the criterion standard for the presence of an anxiety disorder. Thus, the findings of the review also suggested research into the identification of optimal cut-scores of these measures for RACF residents was needed to ensure accurate assessment and detection of this common condition.

In an attempt to enhance our ability to detect anxiety among elderly RACF residents and gain a greater understanding of the characteristics and potential factors associated with the high rates of this condition, a systematic review of the literature into the correlates of anxiety in RACFs was conducted by Creighton et al. (2016). As reported in *Chapter four*, a review of 34 studies identified that the relationship between anxiety and a total of 54 variables had been examined. Overall, the strongest and most consistent associations with anxiety were found to be the presence of depression, lower perceived quality of life, experiencing pain, the use of anti-depressants or lithium, and lower perceived social support. However, as with the literature on the prevalence and assessment of anxiety in RACFs, the review identified a number of limitations that

impact the generalizability and interpretability of the findings. Namely, the majority of variables were examined by only one or two studies, many had contradictory findings, and a number of studies utilised small sample sizes. On the whole, this review contributed to the literature by providing a comprehensive overview of our current understanding of the correlates of anxiety within aged care settings. Moreover, it demonstrated that although some variables have been found to have consistent associations, additional research is needed to clarify hypothesized associations between a number of factors and anxiety. Thus, the review also provided a rationale for the empirical study investigating the correlates of anxiety among aged care residents.

9.3.1. Empirical Study One: The Prevalence, Recognition, and Management of Anxiety in RACFs. The rationale for empirical study one was based on the abovementioned findings of the review presented in *Chapter two*, and addressed research aims one and two by determining the prevalence, recognition, and management of anxiety among elderly aged care residents. As presented in *Chapter six*, 19.4% of the sample ($N = 180$) was found to meet DSM-5 (APA, 2013) criteria for any current threshold anxiety disorder, with GAD and specific phobia being the most common specific disorders, and 34.0% of those with threshold disorders also meeting criteria for MDD. Similar to previous aged care research (e.g., Arvaniti et al., 2005; Junginger et al., 1993; Smalbrugge et al., 2005), these findings demonstrated the high rates of clinical anxiety and comorbid MDD experienced within the current cohort of aged care residents, particularly when compared to community-dwelling older adults (where anxiety disorder rates are between 1.4% to 17.0% (Creighton et al., 2015)). In contrast to previous studies conducted within elderly population-based samples (Grenier et al., 2011; Heun et al., 2000), subthreshold anxiety disorders were found to be *less* prevalent than their threshold counterparts within the current RACF sample (11.7%). This contributed novel information to the literature, and may be explained by the fact that elderly residents believe some level of anxiety is a normal and adaptive part of ageing (Lindesay, Stewart, & Bisla, 2012), and therefore do not perceive their experience of subthreshold anxiety to be 'out of the ordinary' or warrant any attention. It may also be possible that the use of the MINI – which was specifically developed to identify threshold and not subthreshold DSM-5 (APA, 2013) anxiety disorders – may have introduced measurement bias.

Despite the high prevalence of anxiety disorders within the sample, less than half the residents with a threshold or subthreshold anxiety disorder had any indication of anxiety on file. This is consistent with the findings of the only other study found to

examine the recording and treatment of this condition within RACFs (Drageset et al., 2013), and highlights the lack of attention and knowledge around this condition within this setting. This is further evidenced within Australian RACFs, where nationally, there is currently routine screening for depression using the CSDD (Australian Government, 2013) but anxiety is not assessed. This finding provided additional justification for the identification of a psychometrically valid anxiety screening measure for this population.

Interestingly, despite the under-reporting of anxiety within our sample, treatment rates were found to be high, with the majority of those with an anxiety disorder being prescribed an anti-depressant and/or benzodiazepine. A range of potential explanations for these somewhat contradictory findings are outlined in the Discussion of *Chapter six*, and include the possibility that RACF staff are identifying (and treating) anxiety but failing to record it on file, or that the medication was prescribed to treat another condition (e.g., depression). In contrast to the high rate of psychopharmacological treatments, the use psychological interventions was rare. This confirms previous findings that psychotropic medication remains the first-line treatment method for mental health issues such as depression (Davison et al., 2007; Davison et al., 2012) despite the high rates of polypharmacy and negative side-effects experienced by this already frail and compromised population. To the best of our knowledge, this is the first study to examine both the reporting and treatment rates of anxiety within RACFs, thereby providing unique and novel information to the literature.

Overall, level of cognitive impairment was not significantly associated with the presence of any anxiety disorder, or the recognition and treatment of anxiety. This supports Cheok et al., (1996) and Neville and Teri's (2011) finding of no relationship between cognition and anxiety, as well as Davison et al.'s (2007) findings of the treatment and reporting rates of depression in RACFs. However, other studies have found cognitive impairment to have a positive (Smalbrugge, Pot, et al., 2005) and negative (Parmelee et al., 1993; Zuidema et al., 2009) relationship with the presence of anxiety. Thus, given these mixed findings and the current study's exclusion of resident with higher levels of cognitive impairment, the results of the current study remain preliminary. The implications of these findings are discussed further in section 9.5.

9.3.2. Empirical Study Two: The Psychometric Properties, Sensitivity and Specificity of the GAI, HADS-A, and RAID in Elderly RACF Residents. The rationale for empirical study two was based on the findings of the review presented in *Chapter three* and outlined above. The paper addressed research aim three by

examining the reliability, validity, sensitivity, and specificity of the GAI, HADS-A, and RAID; three of the most commonly used measures of anxiety within RACFs.

As presented in *Chapter seven*, the GAI was found to have the strongest level of internal consistency, followed by the RAID and HADS-A. The findings for the GAI and RAID are consistent with the limited past aged care research discussed in *Chapter three* (Gerolimatos et al., 2013; Goyal et al., 2016), and suggest these measures reliably assess the construct of anxiety in RACFs. While within this sample the HADS-A was also found to have adequate internal reliability, it is important to note the range in reliability estimates reported for this sub-scale within this context (from poor to excellent) (Haugan & Drageset, 2014), as this casts some doubt on its robustness within this population. With regards to inter-rater reliability, as found by Goyal et al. (2016), the RAID's inter-rater reliability was also good within the current sample, suggesting that despite the measure requiring a level of clinical judgement, consistent outcomes across clinicians can be achieved. This was likely further strengthened by the use of the structured interview guide by Snow et al. (2012).

In terms of validity, evidence for all three measures' concurrent validity was demonstrated by their significant positive correlations with one another. Similarly, each measure distinguished between residents with and without a GAD diagnosis, which provides evidence of each measure's discriminant validity within the RACF population. This supports previous RACF research for the RAID (Goyal et al., 2016), and provides novel information with regards to the ability of the GAI and HADS-A to differentiate residents with and without an anxiety diagnosis.

Although all three measures were found to have adequate reliability and concurrent and discriminant validity, a ROC analysis revealed the GAI to be the best measure at detecting GAD within the aged care sample, with it being significantly more accurate than the RAID. Specifically, it was found that a cut-off of ≥ 9 on the GAI maximised sensitivity and specificity, with this optimal cut-score being found to have better overall accuracy, sensitivity, and specificity at its optimal cut-point when compared to those of the HADS-A and RAID. This study uniquely contributes to the literature by being the first (to our knowledge) to compare the ability of multiple anxiety measures to accurately detect anxiety within an aged care context, and in doing so provides an indication that the GAI may be the best measure to screen for GAD symptoms with this growing population.

9.3.3. Empirical Study Three: Factors Associated with Anxiety Symptom Severity in Older Adults Living in RACFs. Based on the findings of the review paper

outlined in *Chapter four,* empirical study three addressed research aim four by determining how well a range of biopsychosocial variables predicted self-rated anxiety in a sample of RACF residents. Specifically, the variables included in the analysis were as follows: (1) biological: age, gender, self-perceived health, cognition, number of physical illnesses, functional status; and (2) psychosocial variables: educational level (years), attachment style, perceived level of mastery, social engagement, perceived social support, presence of MDD, experience of a fall, and experience of negative life events, with only those with significant correlations with the anxiety measure (GAI) being entered into the hierarchical regression. As mentioned in *Chapter eight*, these variables were chosen due to the findings of previous RACF and elderly community-based studies. Based on the findings of empirical study two (see *Chapter seven*), the GAI was chosen as the outcome measure of anxiety symptoms due its accuracy and high level of specificity and sensitivity within the aged care sample.

Overall, the findings from this study not only provided further evidence for the strong and significant association between anxiety symptoms and the presence of MDD, it also indicated that the current environment (e.g., perceived social support, current level of social engagement) is *less* predictive of anxiety than longstanding factors (e.g., attachment style). To the best of our knowledge, this is a new finding within this population, and suggests rather than anxiety being a reaction to the current social situation (with the challenges of the environment given much attention in models of wellbeing in older adults), residents may enter RACFs with traits that predispose them to cope better or worse with the frequent changes associated with ageing and residential living (e.g., death of a loved one, forming new relationships within the RACF, declining physical health). Although further research is needed to confirm these findings, the results provide important clinical information that may assist aged care staff to identify residents who are at-risk of experiencing anxiety.

On the whole, the findings of this thesis highlight that anxiety is a common condition within the RACF population and is associated with a range of biopsychosocial variables that likely impact on residents' quality of life. However, despite currently being under-reported and under-recognized by aged care staff, anxiety appears to be accurately and easily assessed using the GAI. In the next section, the strengths and limitations of the research are discussed.

9.4.   STRENGTHS AND LIMITATIONS OF THE RESEARCH

The three systematic reviews (Creighton et al., 2016; Creighton et al., 2015; Creighton et al., 2017) are each, to the best of my knowledge, a novel undertaking that provided a thorough overview of our current understanding of the characteristics and assessment of anxiety in RACFs through the application of a strong methodological design. The specific focus on aged care settings and inclusion of all relevant studies from inception to the present, enabled a more detailed and complete examination of current empirical research into anxiety in aged care settings, giving both researchers and clinicians better insight into the extent of our knowledge on this issue.

The strengths of the three empirical studies include the use of a large sample size (particularly in comparison to previous research) and the use of a random sampling method to recruit a range of different RACF types (e.g., private incorporated bodies, religious facilities, and not-for-profit organisations); both of which help increase generalizability of the findings. The assessment of the prevalence of all key anxiety disorders without the use of hierarchical rules (as done in previous prevalence studies (e.g., Cheok et al., 1996) enabled a more accurate and detailed overview of the prevalence of the condition within the aged care population. Similarly, the inclusion of subthreshold anxiety disorders can also be seen a strength, given that to date only one previous study has examined their prevalence within RACFs (Smalbrugge, Pot, et al., 2005). Attention to subthreshold anxiety is important given research findings that among older adults, a more nonspecific manifestation of anxiety is likely (Flint, 2005). Last, to the best of my knowledge, this series of studies includes the first to examine the prevalence of anxiety in RACFs using current DSM-5 (APA, 2013) criteria, the first study in approximately 21 years to examine the occurrence of this condition within Australian aged care settings specifically, and only the second study worldwide to determine the recognition and treatment rates of anxiety in RACFs. Moreover, the comparison of the psychometric properties of a range of anxiety measures and identification of an appropriate screening measure is also, to my knowledge, a novel undertaking. Thus, a key strength of the studies on the whole is their contribution to our knowledge on the prevalence and characteristics of anxiety in the current cohort of older RACF residents, as well as furthering our understanding on how best to screen for and detect this condition.

Many of the limitations are discussed in detail within each chapter. However a key limitation of the review studies was the lack of a meta-analytic component, which was due to heterogeneity in methodology across studies (e.g., the utilization of a range different anxiety measures) and the inclusion of a broad range of studies. In addition,

the reviews were also limited to peer-reviewed studies published in English. However, while it is worthwhile noting this may have had an impact on the comprehensiveness of the reviews, there is no evidence it causes systematic bias (Morrison et al., 2012).

With regards to the empirical studies, a key limitation was the exclusion of residents with moderate to severe cognitive impairment. Although this was done to ensure the accuracy and reliability of participants' responses, this does limit the generalizability of the findings to those residents with higher cognitive functioning. Similarly, as highlighted in Figure 5.1, of the 919 residents living at the 12 RACFs at the time of recruitment, less than half (46.25%) met inclusion criteria. This is important to note as it may impact on the generalizability of the findings to the wider RACF population (e.g., to those with more severe cognitive impairment or cannot speak English fluently). As previously noted it is also impossible to obtain a true 'gold-standard' measure of anxiety; thus we cannot say that the MINI did not make any classification errors. This may have impacted the reported prevalence estimates of threshold/subthreshold anxiety disorders within the RACF sample, as well as the findings of the sensitivity and specificity of the three anxiety screening measures. Moreover, although the MINI has been used in a number of RACF studies (e.g., Arvaniti et al., 2005; Dozeman et al., 2012), there is the possibility that the non-specific symptoms of anxiety (e.g., fatigue, poor concentration, tremors) assessed by the MINI may have been endorsed by elderly residents experiencing other medical conditions (e.g., COPD, cardiac arrhythmias). Thus, there is a possibility this may have led to an overestimation of the prevalence of anxiety disorders within the RACF setting. In addition, although the sample size used in the current research was large when compared to previous studies, it was not large enough to enable the completion of a logistic regression analyses; where events per variable of 10 or greater (i.e., at least 10 participants with an anxiety disorder were needed per variable) are required to ensure adequate power and validity of the model (Peduzzi, Concato, Kemper, & Holford, 1996). Such analyses would have enabled the prediction of the presence/absence of anxiety disorders from a set of factors, the determination of how well the model classifies cases, as well as provide odds ratios for each factor. Furthermore, it is important to note that the calculation of the sample size for the study was done using 'any anxiety disorder' as the outcome of interest. Thus, the prevalence estimates of the specific DSM-5 (APA, 2013) anxiety disorders provided in Chapter 2 should be considered as 'post-hoc' estimates, meaning their precision and accuracy may be limited by this. Another noteworthy limitation that may have impacted prevalence estimates is the potential of

clustering by specific facilities. That is, it is possible that for some of the included facilities, there was a higher percentage of residents with anxiety disorders who participated in the study, which may have biased the prevalence estimates. Future studies may be able to address this through the use of a larger sample size or utilisation of stratified sampling methods. Last, the use of a cross-sectional design meant that only a 'snap-shot' of the prevalence of anxiety within RACFs could be provided and causal relationships between factors associated with anxiety symptoms could not be made. However, this cross-sectional research does provide a foundation of preliminary evidence of the prevalence and correlates of anxiety in RACFs, from which prospective, longitudinal research can be developed.

9.5. IMPLICATIONS FOR CLINICAL PRACTICE

The empirical findings from this thesis have a range of clinical implications. First, the identification of the high prevalence but low recognition rate of anxiety disorders in the current cohort of RACF residents provides clinicians with further insight into how common anxiety is within this setting and how effective current aged care practices are at detecting and managing this condition. Currently, much attention is paid to depression in RACFs (as evidenced by routine screening for depression across aged care facilities in Australia) and staff are very aware of the need to detect and manage this disorder. However, despite this thesis finding a higher rate of anxiety than depression and previous research finding it to be one of the most common psychiatric conditions in older adults (e.g., Gonçalves et al., 2011; Gum et al., 2009), almost no attention is given to anxiety in both research and clinical RACF contexts. Thus, the high prevalence and under-reporting found in this thesis is a real 'wake-up call' for the aged care sector and suggests facility staff may benefit from further training and education on what anxiety is, how it presents in older adults, and how best to assess for and manage this condition in aged care residents.

Moreover, the low detection and limited use of non-pharmacological treatment methods indicates that increased awareness and education among GPs and RACF staff around anxiety and the benefits of psychotherapy for older adults may be beneficial. One reason for the limited use of psychotherapy in aged care facilities may be due to the overall under-representation of psychologists within this setting. Within Australia, only 11 of 81 RACFs were found to be employing psychologists, with only one of these facilities having a full-time psychologist available (Stargatt et al., 2017). Thus, improving residents' access to mental health professionals would be beneficial.

However, in the absence of psychologists, other psychosocial approaches could potentially be used to reduce anxiety in residents. For example, group reminiscence techniques have been found to reduce anxiety in aged care residents (e.g., Musavi, Mohammadian, & Mohammadinezhad, 2017) and could be employed by the facility's lifestyle coordinators, while the findings from this thesis suggest improving residents' perceived mastery (e.g., by providing more choice and autonomy around how and when care and leisure activities are performed) and self-perceived health could aid in the reduction of anxiety symptoms.

The comparison of three of the most commonly used anxiety measures within RACFs enabled the identification of the most psychometrically reliable and valid tool that can be easily administered by staff (GAI), with the results providing further evidence and support for the use of a cut-score of 9/10 to detect GAD symptoms. Given its brevity and ease of use – a self-report scale comprising 20-items that utilise a dichotomous yes/no response format – it is hoped this finding will encourage RACFs to implement routine screening for anxiety among their residents, which may help improve detection and recognition rates.

The finding that anxiety symptoms are associated with the presence of depression, cognitive impairment, lower self-perceived health, lower mastery, and a preoccupied attachment style among RACF residents is of clinical significance. Not only could this information aid staff in detecting residents who may be at-risk of experiencing anxiety, it also suggests that the implementation of strategies to enhance mastery, self-perceived health, and meaningful relationships may help reduce anxiety within aged care settings. In particular, the novel finding that rather than age-related (e.g., age, objective physical health) or current environmental factors (e.g., perceived social support), more longer-standing traits such as attachment style and mastery have a significant and unique association with anxiety symptoms is important. It suggests older adults may enter the facility with a predisposition to cope better or worse with the unique characteristics associated with residing in an aged care setting, and so RACF staff may find it helpful to assess for and identify these longer-standing traits in newly-admitted residents and tailor their care accordingly.

9.6. FUTURE RESEARCH DIRECTIONS

Given the limited existing research into anxiety among aged care residents, particularly when compared to depression, further research examining and confirming

the findings of the studies included in this thesis is needed. This will help improve our knowledge and understanding of anxiety in this growing and frail population, which is critical given that psychiatric disorders commonly precipitating admission to RACFs (Luppa et al., 2010) and anxiety appears to be widespread in this setting (Creighton et al., 2017). Future research should aim to utilise a prospective, longitudinal design that includes residents with moderate to severe cognitive impairment. Not only would this further extend our knowledge about the timing, onset, and causal factors associated with anxiety in aged care residents, it may also help identify key risk factors that can be used by staff to accurately identify residents who may develop anxiety. This would be further enhanced by future research expanding on the findings outlined in *Chapter eight,* through the investigation of other potential longstanding factors that may predispose residents to anxiety.

One other possible area for future research that does not appear to be well studied within aged care settings is death anxiety. Although beyond the scope of the current thesis, it would be both interesting and important to study the impact that death anxiety has on residents' quality of life and mental health, particularly as some theorists argue that it is the basic fear that underlies all other forms of anxiety and phobia (Becker, 1973). As death anxiety has been found to be associated with physical problems and institutionalization (Fortner & Neimeyer, 1999), it is possible this condition is widespread within RACFs. Research examining its prevalence and association with other anxiety disorders and other factors may lead to more effective strategies to improve residents' overall quality of life and wellbeing.

Given the limited research into the assessment of anxiety in RACFs, future research would be well placed to continue the examination of the reliability, validity, sensitivity, and specificity of commonly used anxiety measures with aged care residents, with a particular focus on the utility of the GAI. Not only would this help confirm the findings outlined in *Chapter seven*, it would also help increase the generalizability of the results to broader aged care populations. Specifically, it would be of great benefit for research to study the implementation of the GAI as a routine screening measure, as this would help determine the impact its use would have on the detection and management of anxiety by staff. This could be done by training aged care staff to use the GAI within their assessment protocol at the time of resident admission to the facility, and then examining the impact this has on staff's ongoing treatment and management of anxiety.

Last, to ensure the implementation of screening for anxiety using the GAI is

worthwhile, future research should also aim to conduct further intervention studies to confirm both the efficacy and effectiveness of treating anxiety disorders that are found by screening. Given that this thesis found low mastery, low self-perceived health, and an a preoccupied attachment style to be associated with anxiety in aged care residents, the development and trialing of interventions aimed at increasing residents' level of mastery and subjective view of their physical health, as well as improving and encouraging the formation of social relationships within the RACF would be beneficial and may help reduce anxiety symptoms. These studies would also provide further evidence of the measure's treatment sensitivity within RACF populations. Similarly, a cost effectiveness analysis of anxiety screening in RACFs would also aid in the evaluation of its overall value.

9.7. CONCLUDING REMARKS

Overall, this thesis presents the first series of studies examining anxiety within the growing elderly RACF population and has provided a range of novel contributions to the literature on anxiety within this context. The findings highlight the prevalence of this condition within aged care settings and its relationship with a range of psychological and social variables. The results suggest anxiety is highly common but still significant under-reported. However, the identification of a brief and valid screening measure to assess for anxiety symptoms is promising and, along with the identification of a range of factors associated with this condition, may aid RACF staff and GPs to better detect and subsequently manage residents who are experiencing/at-risk of experiencing this common but treatable condition.

THESIS REFERENCES

Alexopoulos, G. S., Abrams, R., Young, R. C., & Shamoian, C. A. (1988). Cornell scale for depression in dementia. *Biological Psychiatry, 23*(3), 271-284. doi: 10.1016/0006-3223(88)90038-8

Allen, I., Hogg, D., & Peace, S. M. (1992). *Elderly people: Choice, participation and satisfaction*. London, UK: Policy Studies Institute.

Almeida, O. P., Draper, B., Pirkis, J., Snowdon, J., Lautenschlager, N. T., Byrne, G., . . . Pfaff, J. J. (2012). Anxiety, depression, and comorbid anxiety and depression: Risk factors and outcome over two years. *International Psychogeriatrics, 24*(10), 1622-1632. doi: 10.1017/S104161021200107X

Altman, D. G. (1999). *Practical statistics for medical research*. New York, NY: Chapman & Hall/CRC Press.

Alwahhabi, F. (2003). Anxiety symptoms and generalized anxiety disorder in the elderly: A review. *Harvard Review of Psychiatry, 11*(4), 180-193. doi: 10.1080/10673220303944

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: American Psychiatric Association.

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., revised ed.). Washington, DC: American Psychiatric Association.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association.

Andresen, E. M. (2000). Criteria for assessing the tools of disability outcomes research. *Archives of Physical Medicine and Rehabilitation, 81*(12 SUPPL. 2), S15-S20. doi: 10.1053/apmr.2000.20619

Angst, J., Merikangas, K. R., & Preisig, M. (1997). Subthreshold syndromes of depression and anxiety in the community. *Journal of Clinical Psychiatry, 58*(Suppl 8), 6-10.

Arik, G., Varan, H. D., Yavuz, B. B., Karabulut, E., Kara, O., Kilic, M. K., . . . Cankurtaran, M. (2015). Validation of Katz index of independence in activities of daily living in Turkish older adults. *Archives of Gerontology and Geriatrics, 61*(3), 344-350. doi: 10.1016/j.archger.2015.08.019

Arroll, B., & Kendrick, T. (2009). Anxiety. In L. Gask, H. Lester, T. Kendrick & R. Peveler

(Eds.), *Primary Care Mental Health* (pp. 145-155). London, UK: RCPsych Publications.

Arvaniti, A., Livaditis, M., Kanioti, E., Davis, E., M., S., & Xenitidis, K. (2005). Mental health problems in the elderly in residential care in Greece - A pilot study. *Aging & Mental Health, 9*(2), 142-145. doi: 10.1080/13607860412331336869

Australian Government. (2013). *Aged Care Funding Instrument (ACFI): User Guide*. Canberra, ACT: Commonwealth of Australia.

Australian Government. (2015). *Aged Care Service List*. Canberra, ACT: Australian Government.

Australian Institute of Health and Welfare. (2017). *Older People*. Retrieved from https://www.aihw.gov.au/reports/older-people/older-australia-at-a-glance/contents/summary.

Australian Institute of Health and Welfare. (2012). *Residential aged care and aged care packages in the community: 2011-12*. Retrieved from http://www.aihw.gov.au/aged-care/residential-and-community-2011-12/.

Australian Institute of Health and Welfare. (2013). *Depression in residential aged care: 2008-2012*. Canberra, ACT: AIHW.

Australian Institute of Health and Welfare. (2015). *Residential Aged Care and Home Care 2014-15*. Canberra: Australian Institute of Health and Welfare.

Ayers, C. R., Sorrell, J. T., Thorp, S. R., & Wetherell, J. L. (2007). Evidence-based psychological treatments for late-life anxiety. *Psychology and Aging, 22*(1), 8-17. doi: 10.1037/0882-7974.22.1.8

Azcurra, D. J. L. S. (2012). A Reminiscence Program Intervention to Improve the Quality of Life of Long-term Care Residents with Alzheimer's Disease. A Randomized Controlled Trial. *Revista Brasileira de Psiquiatria, 34*(4), 422-433. doi: https://doi.org/10.1016/j.rbp.2012.05.008

Baldacchino, D. R., & Bonello, L. (2013). Anxiety and depression in care homes in Malta and Australia: Part 1. *British Journal of Nursing, 22*(12), 677-683.

Barlow, D. H., & Comer, J. S. (2013). What are the optimal treatment courses for geriatric anxiety, and how do we find out? *American Journal of Psychiatry, 170*(7), 707-711. doi: 10.1176/appi.ajp.2013.13040513

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults: A test of a four-category model. *Journal of Personality and Social Psychology, 61*(2), 226-244.

Beaudreau, S. A., & Ohara, R. (2008). Late-life anxiety and cognitive impairment: A

review. *American Journal of Geriatric Psychiatry, 16*(10), 790-803. doi: 10.1097/JGP.0b013e31817945c3

Becker, E. (1973). *The denial of death.* New York, NY: Free Press.

Beard, J. R., & Bloom, D. E. (2015). Towards a comprehensive public health response to population ageing. *The Lancet, 385*(9968), 658-661.

Beekman, A. T. F., Bremmer, M. A., Deeg, D. J. H., Van Balkom, A. J. L. M., Smit, J. H., De Beurs, E., . . . Van Tilburg, W. (1998). Anxiety disorders in later life: A report from the longitudinal aging study Amsterdam. *International Journal of Geriatric Psychiatry, 13*(10), 717-726. doi: 10.1002/(SICI)1099-1166(1998100)13:10<717::AID-GPS857>3.0.CO;2-M

Beekman, A. T. F., De Beurs, E., Van Balkom, A. J. L. M., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (2000). Anxiety and depression in later life: Co-occurrence and communality of risk factors. *American Journal of Psychiatry, 157*(1), 89-95.

Bennett, H. E., & Lincoln, N. B. (2006). Potential screening measures for depression and anxiety. *International Journal of Therapy and Rehabilitation, 13*(9), 401-406.

Bergua, V., Meillon, C., Potvin, O., Bouisson, J., Le Goff, M., Rouaud, O., . . . Amieva, H. (2012). The STAI-Y trait scale: Psychometric properties and normative data from a large population-based study of elderly people. *International Psychogeriatrics, 24*(7), 1163-1171. doi: 10.1017/S1041610212000300

Bergua, V., Meillon, C., Potvin, O., Ritchie, K., Tzourio, C., Bouisson, J., . . . Amieva, H. (2016). Short STAI-Y anxiety scales: validation and normative data for elderly subjects. *Aging and Mental Health, 20*(9), 987-995. doi: 10.1080/13607863.2015.1051511

Bewick, V., Cheek, L., & Ball, J. (2004). Statistics review 13: Receiver operating characteristic curves. *Critical Care, 8*(6), 508-512. doi: 10.1186/cc3000

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the Hospital Anxiety and Depression Scale. An updated literature review. *Journal of Psychosomatic Research, 52*(2), 69-77.

Björk, S., Juthberg, C., Lindkvist, M., Wimo, A., Sandman, P., Winblad, B., & Edvardsson, D. (2016). Exploring the prevalence and variance of cognitive impairment, pain, neuropsychiatric symptoms and ADL dependency among persons living in nursing homes; a cross-sectional study. *BMC Geriatrics, 16*(154). doi: 10.1186/s12877-016-0328-9

Bland, R. C., Newman, S. C., & Orn, H. (1988). Prevalence of psychiatric disorders in the elderly in Edmonton. *Acta Psychiatrica Scandinavica, 77*(SUPPL. 338), 57-63.

Boddice, G., Pachana, N. A., & Byrne, G. (2008). The clinical utility of the geriatric anxiety inventory in older adults with cognitive impairment. *Nursing older people, 20*(8), 36-39.

Bosmans, J. E., Dozeman, E., Marwijk, H. W. J., Schaik, D. J. F., Stek, M. L., Beekman, A. T. F., & Horst, H. E. (2014). Cost-effectiveness of a stepped care programme to prevent depression and anxiety in residents in homes for the older people: a randomised controlled trial. *International Journal of Geriatric Psychiatry, 29*(2), 182-190. doi: 10.1002/gps.3987

Bourgeois, J., Elseviers, M. M., Azermai, M., Van Bortel, L., Petrovic, M., & Vander Stichele, R. R. (2012). Benzodiazepine use in Belgian nursing homes: A closer look into indications and dosages. *European Journal of Clinical Pharmacology, 68*(5), 833-844. doi: 10.1007/s00228-011-1188-z

Braam, A. W., Copeland, J. R. M., Delespaul, P. A. E. G., Beekman, A. T. F., Como, A., Dewey, M., . . . Skoog, I. (2014). Depression, subthreshold depression and comorbid anxiety symptoms in older Europeans: Results from the EURODEP concerted action. *Journal of Affective Disorders, 155*(1), 266-272. doi: 10.1016/j.jad.2013.11.011

Braam, A. W., Prince, M. J., Beekman, A. T., Delespaul, P., Dewey, M. E., Geerlings, S. W., . . . Copelan, J. R. (2005). Physical health and depressive symptoms in older Europeans. Results from EURODEP. *British Journal of Psychiatry, 187*, 35-42. doi: 10.1192/bjp.187.1.35

Brase, C. H., & Brase, C. P. (2017). *Understandable statistics: Concepts and methods* (12th ed.). Mason, OH: Cengage Learning, Inc.

Briggs, S. R., & Cheek, J. M. (1986). The role of factor analysis in the development evaluation of personality scales. *Journal of Personality, 54*(1), 106-148.

Brorsson, B., & Asberg, K. H. (1984). Katz index of independence in ADL. Reliability and validity in short-term care. *Scandinvaian Journal of Rehabilitation Medicine, 16*(3), 125-132.

Bryant, C., Jackson, H., & Ames, D. (2008). The prevalence of anxiety in older adults: Methodological issues and a review of the literature. *Journal of Affective Disorders, 109*(3), 233-250. doi: 10.1016/j.jad.2007.11.008

Buccelletti, F., Ojetti, V., Merra, G., Carroccia, A., Marsiliani, D., Mangiola, F., . . . Franceschi, F. (2013). Recurrent use of the Emergency Department in patients with anxiety disorder. *European Review for Medical and Pharmacological Sciences, 17*(Suppl 1), 100-106.

Byers, A. L., Yaffe, K., Covinsky, K. E., Friedman, M. B., & Bruce, M. L. (2010). High occurrence of mood and anxiety disorders among older adults: The National Comorbidity Survey Replication. *Archives of General Psychiatry, 67*(5), 489-496. doi: 10.1001/archgenpsychiatry.2010.35

Byrne, G. J., Pachana, N. A., Goncalves, D. C., Arnold, E., King, R., & Keat Khoo, S. (2010). Psychometric properties and health correlates of the Geriatric Anxiety Inventory in Australian community-residing older women. *Aging and Mental Health, 14*(3), 247-254. doi: 10.1080/13607861003587628

Carlson, M. D. A., & Morrison, R. S. (2009). Study design, precision, and validity in observational studies. *Journal of Palliative Medicine, 12*(1), 77-82. doi: 10.1089/jpm.2008.9690

Carstensen, L. L., & Fremouw, W. J. (1988). The influence of anxiety and mental status on social isolation among the elderly in nursing homes. *Behavioral Residential Treatment, 3*(1), 63-80.

Casten, R. J., Parmelee, P. A., Kleban, M. H., Powell Lawton, M., & Katz, I. R. (1995). The relationships among anxiety, depression, and pain in a geriatric institutionalized sample. *Pain, 61*(2), 271-276. doi: 10.1016/0304-3959(94)00185-H

Casey, A.-N. S., Low, L.-F., Jeon, Y.-H., & Brodaty, H. (2016). Residents Perceptions of Friendship and Positive Social Networks Within a Nursing Home. *The Gerontologist, 56*(5), 855-867. doi: 10.1093/geront/gnv146

Castle, N. G. (2006). Measuring staff turnover in nursing homes. *Gerontologist, 46*(2), 210-219.

Castle, N. G., & Engberg, J. (2005). Staff turnover and quality of care in nursing homes. *Med Care, 43*(6), 616-626.

Chand, S., Ravi, C., & Manepalli, J. (2014). Anxiety disorders in older adults. *Current Geriatrics Reports, 3*(4), 273-281. doi: 10.1007/s13670-014-0105-6

Chatterjee, S., Mehta, S., Sherer, J. T., & Aparasu, R. R. (2010). Prevalence and predictors of anticholinergic medication use in elderly nursing home residents with dementia: Analysis of data from the 2004 national nursing home survey. *Drugs and Aging, 27*(12), 987-997. doi: 10.2165/11584430-000000000-00000

Cheok, A., Snowdon, J., Miller, R., & Vaughan, R. (1996). Prevalence of anxiety disorders in nursing homes. *International Journal of Geriatric Psychiatry, 11*(5), 405-410. doi: 10.1002/(SICI)1099-1166(199605)11:5<405::AID-GPS302>3.0.CO;2-O

Cheung, G., Patrick, C., Sullivan, G., Cooray, M., & Chang, C. L. (2012). Sensitivity and

specificity of the Geriatric Anxiety Inventory and the Hospital Anxiety and Depression Scale in the detection of anxiety disorders in older people with chronic obstructive pulmonary disease. *International Psychogeriatrics, 24*(1), 128-136. doi: 10.1017/S1041610211001426

Chou, K. L., Mackenzie, C. S., Liang, K., & Sareen, J. (2011). Three-year incidence and predictors of first-onset of DSM-IV mood, anxiety, and substance use disorders in older adults: Results from wave 2 of the national epidemiologic survey on alcohol and related conditions. *Journal of Clinical Psychiatry, 72*(2), 144-155. doi: 10.4088/JCP.09m05618gry

Class, C. A., Unverzagt, F. W., Gao, S., Hall, K. S., Baiyewu, O., & Hendrie, H. C. (1996). Psychiatric disorders in African American nursing home residents. *American Journal of Psychiatry, 153*(5), 677-681.

Cohen, C. I., Hyland, K., & Kimhy, D. (2003). The utility of mandatory depression screening of dementia patients in nursing homes. *American Journal of Psychiatry, 160*(11), 2012-2017. doi: 10.1176/appi.ajp.160.11.2012

Cohen, C. I., Magai, C., Yaffee, R., & Walcott-Brown, L. (2006). The prevalence of anxiety and associated factors in a multiracial sample of older adults. *Psychiatric Services, 57*(12), 1719-1725. doi: 10.1176/appi.ps.57.12.1719

Cooke, M. L., Moyle, W., Shum, D. H., Harrison, S. D., & Murfield, J. E. (2010). A randomized controlled trial exploring the effect of music on agitated behaviours and anxiety in older people with dementia. *Aging & Mental Health, 14*(8), 905-916. doi: 10.1080/13607861003713190

Copeland, J. R., Dewey, M. E., Wood, N., Searle, R., Davidson, I. A., & McWilliam, C. (1987). Range of mental illness among the elderly in the community. Prevalence in Liverpool using the GMS-AGECAT package. *The British Journal of Psychiatry, 150*(6), 815-823. doi: 10.1192/bjp.150.6.815

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2015). The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *International Journal of Geriatric Psychiatry, 31*(6), 555-566. doi: 10.1002/gps.4378

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2016). The correlates of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review. *International Journal of Geriatric Psychiatry, 32*(2), 141-154.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2017). The assessment of anxiety in aged care residents: A systematic review of the psychometric properties of

commonly used measures. *International Psychogeriatrics,* 1-13. doi: 10.1017/S1041610217002599

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2018). The prevalence, reporting, and treatment of anxiety among older adults in nursing homes and other residential aged care facilities. *Journal of Affective Disorders, 227*, 416-423. doi: 10.1016/j.jad.2017.11.029

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2017). The psychomertric properties, sensitivity, and specificity of the Geriatiatric Anxiety Inventory, Hospital Anxiety and Depression Scale, Rating Anxiety in Dementia Scale in aged care settings. Manuscript submitted for publication.

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2017). The factors associated with anxiety symptom severity in older adults living in nursing homes and other residential aged care facilities. Manuscript submitted for publication.

Cummings, S. M. (2002). Predictors of psychological well-being among assisted-living residents. *Health and Social Work, 27*(4), 293-302.

Daniel, W. W. (1999). *Biostatistics: A foundation for analysis in the health sciences* (7th ed.). New York, NY: John Wiley & Sons

Davies, K. N., Burn, W. K., McKenzie, F. R., Brothwell, J. A., & Wattis, J. P. (1993). Evaluation of the hospital anxiety and depression scale as a screening instrument in geriatric medical inpatients. *International Journal of Geriatric Psychiatry, 8*(2), 165-169. doi: 10.1002/gps.930080209

Davison, T. E., Eppingstall, B., Runci, S., & O'Connor, D. W. (2016). A pilot trial of acceptance and commitment therapy for symptoms of depression and anxiety in older adults residing in long-term care facilities. *Aging & Mental Health, 21*(7), 766-773. doi: 10.1080/13607863.2016.1156051

Davison, T. E., Koder, D., Helmes, E., Doyle, C., Bhar, S., Mitchell, L., . . . Pachana, N. (2016). Brief on the Role of Psychologists in Residential and Home Care Services for Older Adults. *Australian Psychologist, 52*(6), 397-405. doi: 10.1111/ap.12209

Davison, T. E., McCabe, M. P., Knight, T., & Mellor, D. (2012). Biopsychosocial factors related to depression in aged care residents. *Journal of Affective Disorders, 142*(1-3), 290-296.

Davison, T. E., McCabe, M. P., Mellor, D., Ski, C., George, K., & Moore, K. A. (2007). The prevalence and recognition of major depression among low-level aged care residents with and without cognitive impairment. *Aging & Mental Health, 11*(1), 82-88. doi: 10.1080/13607860600736109

Davison, T. E., Snowdon, J., Castle, N., McCabe, M. P., Mellor, D., Karantzas, G., & Allan, J. (2012). An evaluation of a national program to implement the Cornell Scale for Depression in Dementia into routine practice in aged care facilities. *International Psychogeriatrics, 24*(4), 631-641.

De Bellis, A. (2010). Australian residential aged care and the quality of nursing care provision. *Contemporary Nurse, 35*(1), 100-113. doi: 10.5172/conu.2010.35.1.100

De Beurs, E., Beekman, A. T. F., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (2000). Predictors of change in anxiety symptoms of older persons: Results from the Longitudinal Aging Study Amsterdam. *Psychological Medicine, 30*(3), 515-527. doi: 10.1017/S0033291799001956

De Beurs, E., Beekman, A. T. F., Geerlings, S., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (2001). On becoming depressed or anxious in late life: Similar vulnerability factors but different effects of stressful life events. *British Journal of Psychiatry, 179*(NOV.), 426-431. doi: 10.1192/bjp.179.5.426

De Beurs, E., Beekman, A. T. F., Van Balkom, A. J. L. M., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (1999). Consequences of anxiety in older persons: Its effect on disability, well-being and use of health services. *Psychological Medicine, 29*(3), 583-593. doi: 10.1017/S0033291799008351

de Boer, B., Hamers, J. P. H., Zwakhalen, S. M. G., Tan, F. E. S., & Verbeek, H. (2017). Quality of care and quality of life of people with dementia living at green care farms: a cross-sectional study. *BMC Geriatrics, 17*(1), 155. doi: 10.1186/s12877-017-0550-0

Deloitte Access Economics. (2016). Australia's aged care sector: Economic contribution and future directions. Sydney, NSW.

Dennis, R. E., Boddington, S. J. A., & Funnell, N. J. (2007). Self-report measures of anxiety: Are they suitable for older adults? *Aging and Mental Health, 11*(6), 668-677. doi: 10.1080/13607860701529916

Department of Health and Ageing. (2011). Technical paper on the changing dynamics of residential aged care prepared to assist: the productivity commission inquiry into caring for older Australians. Canberra, ACT: Australian Government.

Depp, C. A., Moore, D. J., Sitzer, D., Palmer, B. W., Eyler, L. T., Roesch, S., . . . Jeste, D. V. (2007). Neurocognitive impairment in middle-aged and older adults with bipolar disorder: Comparison to schizophrenia and normal comparison subjects. *Journal of Affective Disorders, 101*(1-3), 201-209. doi: 10.1016/j.jad.2006.11.022

Diefenbach, G. J., Robison, J. T., Tolin, D. F., & Blank, K. (2004). Late-life anxiety disorders among Puerto Rican primary care patients: Impact on well-being, functioning, and service utilization. *Journal of Anxiety Disorders, 18*(6), 841-858. doi: 10.1016/j.janxdis.2003.10.005

Diefenbach, G. J., Tolin, D. F., Meunier, S. A., & Gilliam, C. M. (2009). Assessment of anxiety in older home care recipients. *Gerontologist, 49*(2), 141-153. doi: 10.1093/geront/gnp019

Dozeman, E., Van Marwijk, H. W. J., Van Schaik, D. J. F., Smit, F., Stek, M. L., Van Der Horst, H. E., . . . Beekman, A. T. F. (2012). Contradictory effects for prevention of depression and anxiety in residents in homes for the elderly: A pragmatic randomized controlled trial. *International Psychogeriatrics, 24*(8), 1242-1251. doi: 10.1017/S1041610212000178

Drageset, J., Dysvik, E., Espehaug, B., Natvig, G. K., & Furnes, B. (2015). Suffering and mental health among older people living in nursing homes-A mixed-methods study. *PeerJ, 2015*(7). doi: 10.7717/peerj.1120

Drageset, J., Eide, G. E., & Ranhoff, A. H. (2013a). Anxiety and depression among nursing home residents without cognitive impairment. *Scandinavian Journal of Caring Sciences, 27*(4), 872-881. doi: 10.1111/j.1471-6712.2012.01095.x

Drageset, J., Eide, G. E., & Ranhoff, A. H. (2013b). Anxiety and depression and mortality among cognitively intact nursing home residents with and without a cancer diagnosis: A 5-year follow-up study. *Cancer Nursing, 36*(4), E68-E74. doi: 10.1097/NCC.0b013e31826fcb11

Dwyer, R., Stoelwinder, J., Gabbe, B., & Lowthian, J. (2015). Unplanned transfer to emergency departments for frail elderly residents of aged care facilities: a review of patient and organizational factors. *Journal of the American Medical Directors Association, 16*(7), 551-562.

Edelstein, B. A., Woodhead, E. L., Segal, D. L., Bower, E. H., Lowery, A. J., & Stoner, S. A. (2007). Older adult psychological assessment. *Clinical Gerontologist, 31*(3), 1-35.

Eng, W., Heimberg, R. G., Hart, T. A., Scheier, F. R., & Liebowitz, M. R. (2001). Attachment in individuals with social anxiety disorder: The relationship among adult attachment styles, social anxiety, and depression. *Emotion, 1*(4), 365-380.

Evers, M. M., Samuels, S. C., Lantz, M. S., Khan, K., Brickman, A. M., & Marin, D. B. (2002). The prevalence, diagnosis and treatment of depression in dementia patients in chronic care facilities in the last six months of life. *International*

Journal of Geriatric Psychiatry, 17(5), 464-472. doi: 10.1002/gps.634

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London, UK: SAGE Publications.

Flint, A. J. (2005). Anxiety and its disorders in late life: Moving the field forward. *American Journal of Geriatric Psychiatry, 13*(1), 3-6. doi: 10.1176/appi.ajgp.13.1.3

Flint, A., & Rifat, S. L. (2002). Factor structure of the hospital anxiety and depression scale in older patients with major depression. *International Journal of Geriatric Psychiatry, 17*(2), 117-123.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12*(3), 189-198.

Fonagy, P., Leigh, T., Steele, M., Steele, H., Kennedy, R., Mattoon, G., . . . Gerber, A. (1996). The relation of attachment status, psychiatric classification, and response to psychotherapy. *Journal of Consulting and Clinical Psychology, 64*(1), 22-31. doi: 10.1037/0022-006X.64.1.22

Forlani, M., Morri, M., Belvederi Murri, M., Bernabei, V., Moretti, F., Attili, T., . . . Atti, A. R. (2014). Anxiety symptoms in 74+ community-dwelling elderly: Associations with physical morbidity, depression and alcohol consumption. *PLoS ONE, 9*(2). doi: 10.1371/journal.pone.0089859

Forsell, Y., & Winblad, B. (1997). Anxiety disorders in non-demented and demented elderly patients: Prevalence and correlates. *Journal of Neurology Neurosurgery and Psychiatry, 62*(3), 294-295.

Forsell, Y., & Winblad, B. (1998). Feelings of anxiety and associated variables in a very elderly population. *International Journal of Geriatric Psychiatry, 13*(7), 454-458. doi: 10.1002/(SICI)1099-1166(199807)13:7<454::AID-GPS795>3.0.CO;2-D

Fortner, B. V., & Neimeyer, R. A. (1999). Death anxiety in older adults: a quantitative review. *Death Studies, 23*(5), 387-411. doi: 10.1080/074811899200920

Fountoulakis, K. N., Tsolaki, M., Chantzi, H., & Kazis, A. (2000). Mini Mental State Examination (MMSE): A validation study in Greece. *American Journal of Alzheimer's Disease, 15*(6), 342-345. doi: doi:10.1177/153331750001500604

Fraley, R. C. (2012). Information on the Experiences in Close Relationships-Revised (ECR-R) Adult Attachment Questionnaire. Retrieved 19th September 2017, from http://internal.psychology.illinois.edu/~rcfraley/measures/ecrr.htm

Fraley, R. C., Heffernan, M. E., Vicary, A. M., & Brumbaugh, C. C. (2011). The Experiences in Close Relationships-Relationship Structures questionnaire: a

method for assessing attachment orientations across relationships. *Psychological Assessment, 23*(3), 615-625. doi: 10.1037/a0022898

Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item-response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology, 78*(2), 350-365.

Garcia, A., Freeman, J., Francis, G., Miller, L. M., & Leonard, H. L. (2004). Selective mutism. In T. Ollendick (Ed.), *Phobic and anxiety disorders in children and adolescents: A clinician's guide to effective psychosocial and pharmacological interventions* (pp. 433-455). London, UK: Oxford University Press.

Gaugler, J. E., Duval, S., Anderson, K. A., & Kane, R. L. (2007). Predicting nursing home admission in the U.S: A meta-analysis. *BMC Geriatrics, 7*. doi: 10.1186/1471-2318-7-13

Gerolimatos, L. A., Gregg, J. J., & Edelstein, B. A. (2013). Assessment of anxiety in long-term care: Examination of the Geriatric Anxiety Inventory (GAI) and its short form. *International Psychogeriatrics, 25*(9), 1533-1542. doi: 10.1017/S1041610213000847

Gerritsen, D. L., Steverink, N., Frijters, D. H. M., Hirdes, J. P., Ooms, M. E., & Ribbe, M. W. (2008). A revised index for social engagement for long-term care. *Journal of Gerontological Nursing, 34*(4), 40-48.

Gildengers, A. G., Butters, M. A., Chisholm, D., Anderson, S. J., Begley, A., Holm, M., . . . Mulsant, B. H. (2012). Cognition in older adults with bipolar disorder versus major depressive disorder. *Bipolar Disorders, 14*(2), 198-205. doi: 10.1111/j.1399-5618.2012.00995.x

Gonçalves, D. C., Pachana, N. A., & Byrne, G. J. (2011). Prevalence and correlates of generalized anxiety disorder among older adults in the Australian National Survey of Mental Health and Well-Being. *Journal of Affective Disorders, 132*(1–2), 223-230. doi: 10.1016/j.jad.2011.02.023

Gould, C. E., Segal, D. L., Yochim, B. P., Pachana, N. A., Byrne, G. J., & Beaudreau, S. A. (2014). Measuring anxiety in late life: A psychometric examination of the Geriatric Anxiety Inventory and Geriatric Anxiety Scale. *Journal of Anxiety Disorders, 28*(8), 804-811. doi: 10.1016/j.janxdis.2014.08.001

Goyal, A. R., Bergh, S., Engedal, K., Kirkevold, M., & Kirkevold, Ø. (2016). Norwegian version of the rating anxiety in dementia scale (RAID-N): a validity and reliability study. *Aging and Mental Health*, 1-6. doi: 10.1080/13607863.2016.1220921

Grenier, S., Préville, M., Boyer, R., O'Connor, K., Béland, S. G., Potvin, O., . . . Brassard, J. (2011). The impact of DSM-IV symptom and clinical significance criteria on the prevalence estimates of subthreshold and threshold anxiety in the older adult population. *American Journal of Geriatric Psychiatry, 19*(4), 316-326. doi: 10.1097/JGP.0b013e3181ff416c

Grenier, S., Schuurmans, J., Goldfarb, M., Préville, M., Boyer, R., O'Connor, K., . . . Hudon, C. (2011). The epidemiology of specific phobia and subthreshold fear subtypes in a community-based sample of older adults. *Depression and Anxiety, 28*(6), 456-463. doi: 10.1002/da.20812

Groll, D. L., To, T., Bombardier, C., & Wright, J. G. (2005). The development of a comorbidity index with physical function as the outcome. *Journal of Clinical Epidemiology, 58*(6), 595-602.

Gruber-Baldini, A. L., Zimmerman, S., Boustani, M., Watson, L. C., Williams, C. S., & Reed, P. S. (2005). Characteristics associated with depression in long-term care residents with dementia. *The Gerontologist, 45*(suppl_1), 50-55. doi: 10.1093/geront/45.suppl_1.50

Gum, A. M., King-Kallimanis, B., & Kohn, R. (2009). Prevalence of mood, anxiety, and substance-abuse disorders for older Americans in the national comorbidity survey-replication. *American Journal of Geriatric Psychiatry, 17*(9), 769-781. doi: 10.1097/JGP.0b013e3181ad4f5a

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate Data Analysis* (7th ed.). England, UK: Pearson Education Ltd.

Hajjar, E. R., Cafiero, A. C., & Hanlon, J. T. (2007). Polypharmacy in elderly patients. *The American Journal of Geriatric Pharmacotherapy, 5*(4), 345-351. doi: http://dx.doi.org/10.1016/j.amjopharm.2007.12.002

Hamilton, M. (1959). The assessment of anxiety states by rating. *British Journal of Medical Psychology, 32*(1), 50-55.

Hancock, G. A., Woods, B., Challis, D., & Orell, M. (2006). The needs of older people with dementia in residential care. *International Journal of Geriatric Psychiatry, 21*(1), 43-49. doi: 10.1002/gps.1421

Hanley, J. A., & McNeil, B. J. (1983). A method of comparing the areas under receiver operating characteristic curves derived from the same cases. *Radiology, 148*(3), 839-843. doi: 10.1148/radiology.148.3.6878708

Harris-Kojetin, L., Sengupta, M., Park-Lee, E., & Valverde, R. (2013). *Long-term care services in the United States: 2013 overview*. Hyattsville, MD: National Center

for Health Statistics.

Haslam, C., Haslam, S. A., Jetten, J., Bevins, A., Ravenscroft, S., & Tonks, J. (2010). The social treatment: The benefits of group interventions in residential care settings. *Psychology & Aging, 25*(1), 157-167. doi: 10.1037/a0018256

Haugan, G. (2014). Meaning-in-life in nursing-home patients: a correlate with physical and emotional symptoms. *Journal of Clinical Nursing, 23*(7-8), 1030-1043. doi: 10.1111/jocn.12282

Haugan, G. (2015). The FACIT-Sp spiritual well-being scale: an investigation of the dimensionality, reliability and construct validity in a cognitively intact nursing home population. *Scandinavian Journal of Caring Sciences, 29*(1), 152-164. doi: 10.1111/scs.12123

Haugan, G., & Drageset, J. (2014). The Hospital Anxiety and Depression Scale - Dimensionality, reliability and construct validity among cognitively intact nursing home patients. *Journal of Affective Disorders, 165*, 8-15. doi: 10.1016/j.jad.2014.04.042

Haugan, G., Innstrand, S. T., & Moksnes, U. K. (2013). The effect of nurse-patient interaction on anxiety and depression in cognitively intact nursing home patients. *Journal of Clinical Nursing, 22*(15-16), 2192-2205. doi: 10.1111/jocn.12072

Helvik, A. S., Engedal, K., Skancke, R. H., & Selbaek, G. (2011). A psychometric evaluation of the Hospital Anxiety and Depression Scale for the medically hospitalized elderly. *Nordic Journal of Psychiatry, 65*(5), 338-344.

Heun, R., Papassotiropoulos, A., & Ptok, U. (2000). Subthreshold depressive and anxiety disorders in the elderly. *European Psychiatry, 15*(3), 173-182. doi: 10.1016/S0924-9338(00)00228-5

Hillcoat-Nallétamby, S. (2014). The meaning of "independence" for older people in different residential settings. *The Journals of Gerontology: Series B, 69*(3), 419-430. doi: 10.1093/geronb/gbu008

Hoe, J., Hancock, G., Livingston, G., & Orrell, M. (2006). Quality of life of people with dementia in residential care homes. *British Journal of Psychiatry, 188*(MAY), 460-464. doi: 10.1192/bjp.bp.104.007658

Holloway, K. L., Williams, L. J., Brennan-Olsen, S. L., Morse, A. G., Kotowicz, M. A., Nicholson, G. C., & Pasco, J. A. (2016). Anxiety disorders and falls among older adults. *Journal of Affective Disorders, 205*(Supplement C), 20-27. doi: https://doi.org/10.1016/j.jad.2016.06.052

ISI Web of Science. (2017). InCites Journal Citation Reports. Retrieved 25th September 2017.

Jervis, L. L., & Manson, S. M. (2007). Cognitive impairment, psychiatric disorders, and problematic behaviors in a tribal nursing home. *Journal of Aging and Health, 19*(2), 260-274. doi: 10.1177/0898264306297191

Jeste, D. V., Blazer, D. G., & First, M. (2005). Aging-related diagnostic variations: Need for diagnostic criteria appropriate for elderly psychiatric patients. *Biological Psychiatry, 58*(4), 265-271. doi: 10.1016/j.biopsych.2005.02.004

Jeste, N. D., Hays, J. C., & Steffens, D. C. (2006). Clinical correlates of anxious depression among elderly patients with depression. *Journal of Affective Disorders, 90*(1), 37-41. doi: 10.1016/j.jad.2005.10.007

Johnco, C., Knight, A., Tadic, D., Wuthrich, V. M., Pachana, N. A., & Oude Voshaar, R. C. (2015). Psychometric properties of the Geriatric Anxiety Inventory (GAI) and its short-form (GAI-SF) in a clinical and non-clinical sample of older adults. *International Psychogeriatrics, 27*(7), 1089-1097. doi: 10.1017/S1041610214001586

Jones, R. N., & Gallo, J. J. (2000). Dimensions of the Mini-Mental State Examination among community dwelling older adults. *Psychol Med, 30*(3), 605-618.

Junginger, J., Phelan, E., Cherry, K., & Levy, J. (1993). Prevalence of psychopathology in elderly persons in nursing homes and in the community. *Hospital and Community Psychiatry, 44*(4), 381-383.

Kabacoff, R. I., Segal, D. L., Hersen, M., & Van Hasselt, V. B. (1997). Psychometric properties and diagnostic utility of the Beck Anxiety Inventory and the State-Trait Anxiety Inventory with older adult psychiatric outpatients. *Journal of Anxiety Disorders, 11*(1), 33-47. doi: 10.1016/S0887-6185(96)00033-3

Kafetsios, K., & Sideridis, G. S. (2006). Attachment, social support, and well-being in young and older adults. *Journal of Health Psychology, 11*(6), 863-875.

Kamble, P., Chen, H., Sherer, J. T., & Aparasu, R. R. (2009). Use of antipsychotics among elderly nursing home residents with dementia in the US: An analysis of national survey data. *Drugs and Aging, 26*(6), 483-492. doi: 10.2165/00002512-200926060-00005

Kane, R. A., Caplan, A. L., Urv-Wong, E. K., Freeman, I. C., Aroskar, M. A., & Finch, M. (1997). Everyday matters in the lives of nursing home residents: Wish for and perception of choice and control. *Journal of the American Geriatrics Society, 45*(9), 1086-1093. doi: 10.1111/j.1532-5415.1997.tb05971.x

Kang, H. (2012). Correlates of social engagement in nursing home residents with dementia. *Asian Nursing Research, 6*(2), 75-81. doi: 10.1016/j.anr.2012.05.006

Kang, H., Smith, M., Buckwalter, K. C., Ellingrod, V., & Schultz, S. K. (2010). Anxiety, depression, and cognitive impairment in dementia-specific and traditional assisted living. *Journal of Gerontological Nursing, 36*(1), 18-32. doi: 10.3928/00989134-20091204-01

Karkare, S. U., Bhattacharjee, S., Kamble, P., & Aparasu, R. (2011). Prevalence and predictors of antidepressant prescribing in nursing home residents in the United States. *American Journal Geriatric Pharmacotherapy, 9*(2), 109-119. doi: 10.1016/j.amjopharm.2011.03.001

Karlsson, B., Klenfeldt, I. F., Sigström, R., Waern, M., Östling, S., Gustafson, D., & Skoog, I. (2009). Prevalence of social phobia in non-demented elderly from a swedish population study. *American Journal of Geriatric Psychiatry, 17*(2), 127-135. doi: 10.1097/JGP.0b013e3181860051

Katz, S., Ford, A. B., Moskowitz, R. W., Jackson, B. A., & Jaffe, M. W. (1963). Studies of illness in the aged. The index of ADL: A standardized measure of biological and psychosocial function. *Journal of American Medical Association, 185*(12), 914-919. doi: 10.1001/jama.1963.03060120024016

Kay, D. W. K., Holding, T. A., Jones, B., & Littler, S. (1987). Psychiatric morbitity in Hobart's dependent aged. *Australian and New Zealand Journal of Psychiatry, 21*(4), 463-475.

Keister, K. J. (2006). Predictors of self-assessed health, anxiety, and depressive symptoms in nursing home residents at week 1 postrelocation. *Journal of Aging & Health, 18*(5), 722-742.

Kessler, R. C., Brandenburg, N., Lane, M., Roy-Byrne, P., Stang, P. D., Stein, D. J., & Wittchen, H. U. (2005). Rethinking the duration requirement for generalized anxiety disorder: Evidence from the National Comorbidity Survey Replication. *Psychological Medicine, 35*(7), 1073-1082. doi: 10.1017/S0033291705004538

Kirmizioglu, Y., Doğan, O., Kuğu, N., & Akyüz, G. (2009). Prevalence of anxiety disorders among elderly people. *International Journal of Geriatric Psychiatry, 24*(9), 1026-1033. doi: 10.1002/gps.2215

Kmet, L. M., Lee, R. C., & Cook, L. S. (2004). *Standard quality assessment criteria for evaluating primary research papers from a variety of fields*. Alberta, Canada: Alberta Heritage Foundation for Medical Research.

Knight, T., Davison, T. E., McCabe, M. P., & Mellor, D. (2011). Environmental mastery

and depression in older adults in residential care. *Ageing and Society, 31*(5), 870-884. doi: 10.1017/S0144686X1000142X

Kogan, J. N., Edelstein, B. A., & McKee, D. R. (2000). Assessment of anxiety in older adults: Current status. *Journal of Anxiety Disorders, 14*(2), 109-132. doi: 10.1016/S0887-6185(99)00044-4

Kohen, I., Lester, P. E., & Lam, S. (2010). Antipsychotic treatments for the elderly: efficacy and safety of aripiprazole. *Neuropsychiatric Disease and Treatment, 6*, 47-58.

Krasucki, C., Howard, R., & Mann, A. (1999). Anxiety and its treatment in the elderly. *International Psychogeriatrics, 11*(1), 25-45.

Kvaal, K., Ulstein, I., Nordhus, I. H., & Engedal, K. (2005). The Spielberger State-Trait Anxiety Inventory (STAI): the state scale in detecting mental disorders in geriatric patients. *International Journal of Geriatric Psychiatry, 20*(7), 629-634. doi: 10.1002/gps.1330

Landi, F., Dell'Aquila, G., Collamati, A., Martone, A. M., Zuliani, G., Gasperini, B., . . . Cherubini, A. (2015). Anticholinergic drug use and negative outcomes among the frail elderly population living in a nursing home. *Journal of the American Medical Directors Association, 15*(11), 825-829.

Lapane, K. L., Quilliam, B. J., Chow, W., & Kim, M. (2012). The Association Between Pain and Measures of Well-Being Among Nursing Home Residents. *Journal of the American Medical Directors Association, 13*(4), 344-349. doi: 10.1016/j.jamda.2011.01.007

Lecrubier, Y., Sheehan, D. V., Weiller, E., Amorim, P., Bonora, I., Harnett Sheehan, K., . . . Dunbar, G. C. (1997). The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI. *European Psychiatry, 12*(5), 224-231. doi: http://dx.doi.org/10.1016/S0924-9338(97)83296-8

Lenze, E. J., & Wetherell, J. L. (2011). A lifespan view of anxiety disorders. *Dialogues in Clinical Neuroscience, 13*(4), 381-399.

Leong, I. Y., & Nuo, T. H. (2007). Prevalence of pain in nursing home residents with different cognitive and communicative abilities. *Clinical Journal of Pain, 23*(2), 119-127.

Lewinsohn, P. M., Shankman, S. A., Gau, J. M., & Klein, D. N. (2004). The prevalence and co-morbidity of subthreshold psychiatric conditions. *Psychological Medicine, 34*(4), 613-622. doi: 10.1017/S0033291703001466

Lin, Y., & Taylor, A. G. (1998). Effects of therapeutic touch in reducing pain and anxiety in an elderly population. *Integrative Medicine, 1*(4), 155-162.

Lindesay, J., Stewart, R., & Bisla, J. (2012). Anxiety disorders in older people. *Reviews in Clinical Gerontology, 22*(3), 204-217. doi: 10.1017/S0959259812000019

Lopes, T. S., Afonso, R. M. L. B. M., & Ribeiro, Ó. M. (2016). A quasi-experimental study of a reminiscence program focused on autobiographical memory in institutionalized older adults with cognitive impairment. *Archives of Gerontology and Geriatrics, 66*, 183-192. doi: 10.1016/j.archger.2016.05.007

Losada, A., Márquez-González, M., Pachana, N. A., Wetherell, J. L., Fernández-Fernández, V., Nogales-González, C., & Ruiz-Díaz, M. (2014). Behavioral correlates of anxiety in well-functioning older adults. *International Psychogeriatrics*. doi: 10.1017/S1041610214001148

Luppa, M., Luck, T., Weyerer, S., König, H., Brähler, E., & Riedel-Heller, S. G. (2010). Prediction of institutionalization in the elderly: A systematic review. *Age and Ageing, 39*(1), 31-38. doi: 10.1093/ageing/afp202

Lustenberger, I., Schüpbach, B., Von Gunten, A., & Mosimann, U. P. (2011). Psychotropic medication use in Swiss nursing homes. *Swiss Medical Weekly, 141*(OCTOBER). doi: 10.4414/smw.2011.13254

Manela, M., Katona, C., & Livingston, G. (1996). How common are the anxiety disorders in old age? *International Journal of Geriatric Psychiatry, 11*(1), 65-70. doi: 10.1002/(SICI)1099-1166(199601)11:1<65::AID-GPS296>3.0.CO;2-M

Mansbach, W. E., Mace, R. A., & Clark, K. M. (2014). The Brief Anxiety and Depression Scale (BADS): a new instrument for detecting anxiety and depression in long-term care residents. *International Psychogeriatrics, 27*(4), 673-681. doi: 10.1017/S1041610214002397

Matthews, F. E., & Dening, T. (2002). Prevalence of dementia in institutional care. *The Lancet, 360*(9328), 225-226. doi: 10.1016/S0140-6736(02)09461-8

McCabe, M. P., Mellor, D., Karantzas, G., Von Treuer, K., Davison, T., & O'Connor, D. W. (2017). Organizational factors related to the confidence of workers in working with residents with dementia or depression in aged care facilities. *Aging & Mental Health, 21*(5), 487-493. doi: 10.1080/13607863.2015.1118011

McDade-Montez, E. A., Watson, D., O'Hara, M. W., & Denburg, N. L. (2008). The effect of symptom visibility on informant reporting. *Psychology and Aging, 23*(4), 940-946. doi: 10.1037/a0014297

McSweeney, K., & O'Connor, D. W. (2008). Depression among newly admitted Australian nursing home residents. *International Psychogeriatrics, 20*(4), 724-737. doi: 10.1017/S104161020800700X

Mehta, K. M., Simonsick, E. M., Penninx, B. W. J. H., Schulz, R., Rubin, S. M., Satterfield, S., & Yaffe, K. (2003). Prevalence and correlates of anxiety symptoms in well-functioning older adults: Findings from the health aging and body composition study. *Journal of the American Geriatrics Society, 51*(4), 499-504. doi: 10.1046/j.1532-5415.2003.51158.x

Menant, J. C., Wong, A., Sturnieks, D. L., Close, J. C. T., Delbaere, K., Sachdev, P. S., . . . Lord, S. R. (2013). Pain and anxiety mediate the relationship between dizziness and falls in older people. *Journal of the American Geriatrics Society, 61*(3), 423-428. doi: 10.1111/jgs.12131

Milliren, J. W. (1977). Some contingencies affecting the utilization of tranquilizers in long term care of the elderly. *Journal of Health and Social Behavior, 18*(2), 206-211.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med, 6*(7), e1000097. doi: doi:10.1371/journal.pmed.1000097

Moreira, H., Martins, T., Gouveia, M. J., & Canavarro, M. C. (2015). Assessing adult attachment across different contexts: validation of the Portuguese version of the experiences in Close Relationships-Relationship Structures questionnaire. *Journal of Personality Assessment, 97*(1), 22-30. doi: 10.1080/00223891.2014.950377

Moreno, R. P., Solana, E. I., Rico, M. A., & Fernandez, L. M. L. (2008-2009). Death anxiety in institutionalized and non-institutionalized elderly people in Spain. *Omega, 58*(1), 61-76.

Morrison, A., Polisena, J., Husereau, D., Moulton, K., Clark, M., Fiander, M., . . . Rabb, D. (2012). The effect of English-language restriction on systematic review-based meta-analyses: a systematic review of empirical studies. *International Journal of Technolology Assessment in Health Care, 28*(2), 138-144. doi: 10.1017/s0266462312000086

Mullins, L. C., & Lopez, M. A. (1982). Death anxiety among nursing home residents: a comparison of the young-old and the old-old. *Death Education, 6*(1), 75-86. doi: 10.1080/07481188208252117

Musavi, M., Mohammadian, S., & Mohammadinezhad, B. (2017). The effect of group integrative reminiscence therapy on mental health among older women living in Iranian nursing homes. *Nursing Open, 4*(4), 303-309. doi: 10.1002/nop2.101

Nagatomo, I., Nomaguchi, M., & Takigawa, M. (1995). Anxiety and quality of life in residents of a special nursing home. *International Journal of Geriatric Psychiatry, 10*(7), 541-545. doi: 10.1002/gps.930100703

Naing, L., Winn, T., & Rusli, B. N. (2006). Practical issues in calculating the sample size for prevalence studies. *Archives of Orofacial Sciences, 1*(1), 9-14.

Neville, C., & Teri, L. (2011). Anxiety, anxiety symptoms, and associations among older people with dementia in assisted-living facilities. *International Journal of Mental Health Nursing, 20*(3), 195-201. doi: 10.1111/j.1447-0349.2010.00724.x

Nijk, R. M., Zuidema, S. U., & Koopmans, R. T. C. M. (2009). Prevalence and correlates of psychotropic drug use in Dutch nursing-home patients with dementia. *International Psychogeriatrics, 21*(3), 485-493. doi: 10.1017/S1041610209008916

Norton, J., Ancelin, M. L., Stewart, R., Berr, C., Ritchie, K., & Carrière, I. (2012). Anxiety symptoms and disorder predict activity limitations in the elderly. *Journal of Affective Disorders, 141*(2-3), 276-285. doi: 10.1016/j.jad.2012.04.002

Olsen, C. F., Telenius, E. W., Engedal, K., & Bergland, A. (2015). Increased self-efficacy: the experience of high-intensity exercise of nursing home residents with dementia – a qualitative study. *BMC Health Serv Res, 15*(1), 379. doi: 10.1186/s12913-015-1041-7

Onder, G., Carpenter, I., Finne-Soveri, H., Gindin, J., Frijters, D., Henrard, J. C., . . . Bernabei, R. (2012). Assessment of nursing home residents in Europe: the Services and Health for Elderly in Long TERm care (SHELTER) study. *BMC Health Serv Res, 12*(5), 1-10. doi: 10.1186/1472-6963-12-5

Pachana, N. A., Byrne, G. J., Siddle, H., Koloski, N., Harley, E., & Arnold, E. (2007). Development and validation of the Geriatric Anxiety Inventory. *International Psychogeriatrics, 19*(1), 103-114. doi: 10.1017/S1041610206003504

Parmelee, P. A., Katz, I. R., & Lawton, M. P. (1993). Anxiety and its association with depression among institutionalized elderly. *American Journal of Geriatric Psychiatry, 1*(1), 46-58.

Pearlin, L. I., Lieberman, M. A., Menaghan, E. G., & Mullan, J. T. (1981). The stress process. *Journal of Health and Social Behavior, 22*(4), 337-356.

Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19*(1), 2-21.

Peduzzi, P., Concato, J., Kemper, E., Holford, T. R., & Feinstein, A. R. (1996). A simulation study of the number of events per variable in logistic regression analysis. *Journal of Clinical Epidemiology, 49*(12), 1373-1379.

Pintea, S., & Moldovan, R. (2009). The receiver-operating characteristic (ROC) analysis: Fundamentals and applications in clinical psychology. *Journal of Cognitive and Behavioral Psychotherapies, 9*(1), 49-66.

Potvin, O., Bergua, V., Meillon, C., Le Goff, M., Bouisson, J., Dartigues, J. F., & Amieva, H. (2011). Norms and associated factors of the STAI-Y State anxiety inventory in older adults: Results from the PAQUID study. *International Psychogeriatrics, 23*(6), 869-879. doi: 10.1017/S1041610210002358

Prado-Jean, A., Couratier, P., Druet-Cabanac, M., Nubukpo, P., Bernard-Bourzeix, L., Thomas, P., . . . Clément, J. P. (2010). Specific psychological and behavioral symptoms of depression in patients with dementia. *International Journal of Geriatric Psychiatry, 25*(10), 1065-1072. doi: 10.1002/gps.2468

Préville, M., Boyer, R., Grenier, S., Dubé, M., Voyer, P., Punti, R., . . . Brassard, J. (2008). The epidemiology of psychiatric disorders in Quebec's older adult population. *Canadian Journal of Psychiatry, 53*(12), 822-832.

Qian, S., Yu, P., Hailey, D. M., Zhang, Z., & Davy, P. (2014). Time spent on daytime direct care activities by personal carers in two Australian residential aged care facilities: a time-motion study. *Australian Health Review, 38*(2), 230-237.

Resnick, H. E., Fries, B. E., & Verbrugge, L. M. (1997). Windows to their world: The effect of sensory impairments on social engagaement and activity time in nursing home residents. *The Journals of Gerontology, Series B: Psychological Sciences & Social Sciences, 52*(3), S135-S144.

Richmond, R. L., Law, J., & Kay-Lambkin, F. (2011). Physical, Mental, and Cognitive Function in a Convenience Sample of Centenarians in Australia. *Journal of the American Geriatrics Society, 59*(6), 1080-1086. doi: 10.1111/j.1532-5415.2011.03404.x

Ribeiro, O., Teixeira, L., Araújo, L., Afonso, R. M., & Pachana, N. (2015). Predictors of anxiety in centenarians: health, economic factors, and loneliness. *International Psychogeriatrics, 27*(7), 1167-1176. doi: 10.1017/S1041610214001628

Ritchie, K., Artero, S., Beluche, I., Ancelin, M. L., Mann, A., Dupuy, A. M., . . . Boulenger, J. P. (2004). Prevalence of DSM-IV psychiatric disorder in the French elderly population. *British Journal of Psychiatry, 184*(FEB.), 147-152. doi: 10.1192/bjp.184.2.147

Ritchie, K., Norton, J., Mann, A., Carrière, I., & Ancelin, M. L. (2013). Late-onset agoraphobia: General population incidence and evidence for a clinical subtype. *American Journal of Psychiatry, 170*(7), 790-798. doi: 10.1176/appi.ajp.2013.12091235

Roberts, M. H., Fletcher, R. B., & Merrick, P. L. (2014). The validity and clinical utility of the Hospital Anxiety and Depression Scale (HADS) with older adult New Zealanders. *International Psychogeriatrics, 26*(2), 325-333. doi: 10.1017/S104161021300197X

Rozzini, L., Chilovi, B. V., Peli, M., Conti, M., Rozzini, R., Trabucchi, M., & Padovani, A. (2009). Anxiety symptoms in mild cognitive impairment. *International Journal of Geriatric Psychiatry, 34*(3), 300-305.

Sandberg, O., Gustafson, Y., Brännström, B., & Bucht, G. (1998). Prevalence of dementia, delirium and psychiatric symptoms in various care settings for the elderly. *Scandinavian Journal of Public Health, 26*(1), 56-62.

Schoevers, R. A., Beekman, A. T. F., Deeg, D. J. H., Jonker, C., & Van Tilburg, W. (2003). Comorbidity and risk-patterns of depression, generalised anxiety disorder and mixed anxiety-depression in later life: Results from the AMSTEL study. *International Journal of Geriatric Psychiatry, 18*(11), 994-1001. doi: 10.1002/gps.1001

Seitz, D., Purandare, N., & Conn, D. (2010). Prevalence of psychiatric disorders among older adults in long-term care homes: A systematic review. *International Psychogeriatrics, 22*(7), 1025-1039. doi: 10.1017/S1041610210000608

Selbæk, G., Kirkevold, Ø., & Engedal, K. (2007). The prevalence of psychiatric symptoms and behavioural disturbances and the use of psychotropic drugs in Norwegian nursing homes. *International Journal of Geriatric Psychiatry, 22*(9), 843-849. doi: 10.1002/gps.1749

Selwood, A., Thorgrimsen, L., & Orrell, M. (2005). Quality of life in dementia -- a one-year follow-up study. *International Journal of Geriatric Psychiatry, 20*(3), 232-237.

Shankar, K. K., Walker, M., Frost, D., & Orrell, M. W. (1999). The development of a valid and reliable scale for rating anxiety in dementia (RAID). *Aging and Mental Health, 3*(1), 39-49. doi: 10.1080/13607869956424

Sharaf, A. Y., & Ibrahim, H. S. (2008). Physical and psychosocial correlates of fear of falling among older adults in assisted living facilities. *Journal of Gerontological Nursing, 34*(12), 27-35. doi: 10.3928/00989134-20081201-07

Shear, K., Jin, R., Ruscio, A. M., Walters, E. E., & Kessler, R. C. (2006). Prevalence and correlates of estimated DSM-IV child and adult separation anxiety diorder in the national comorbidity survey replication (NCS-R). *American Journal of Psychiatry, 163*(6), 1074-1083. doi: 10.1176/appi.ajp.163.6.1074

Sheehan, D. V., Lecrubier, Y., Harnett-Sheehan, K., Janavs, J., Weiller, E., Keskiner, A., . . . Dunbar, G. C. (1997). The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *European Psychiatry, 12*(5), 232-241.

Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., . . . Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-1. *Journal of Clinical Psychiatry, 59*(Suppl. 20), 22-33.

Smalbrugge, M., Jongenelis, L., Pot, A. M., Beekman, A. T. F., & Eefsting, J. A. (2005). Comorbidity of depression and anxiety in nursing home patients. *International Journal of Geriatric Psychiatry, 20*(3), 218-226. doi: 10.1002/gps.1269

Smalbrugge, M., Jongenelis, L. K., Pot, A. M., Beekman, A. T. F., & Eefsting, J. A. (2007). Pain among nursing home patients in the Netherlands: Prevalence, course, clinical correlates, recognition and analgesic treatment - An observational cohort study. *BMC Geriatrics, 7.* doi: 10.1186/1471-2318-7-3

Smalbrugge, M., Pot, A. M., Jongenelis, K., Beekman, A. T. F., & Eefsting, J. A. (2005). Prevalence and correlates of anxiety among nursing home patients. *Journal of Affective Disorders, 88*(2), 145-153. doi: 10.1016/j.jad.2005.06.006

Smalbrugge, M., Pot, A. M., Jongenelis, L., Gundy, C. M., Beekman, A. T. F., & Eefsting, J. A. (2006). The impact of depression and anxiety on well being, disability and use of health care services in nursing home patients. *International Journal of Geriatric Psychiatry, 21*(4), 325-332. doi: 10.1002/gps.1466

Smit, F., Comijs, H., Schoevers, R., Cuijpers, P., Deeg, D., & Beekman, A. (2007). Target groups for the prevention of late-life anxiety. *British Journal of Psychiatry, 190*(MAY), 428-434. doi: 10.1192/bjp.bp.106.023127

Smith, M., Buckwalter, K. C., Kang, H., Ellingrod, V., & Schultz, S. K. (2008). Dementia-specific assisted living: clinical factors and psychotropic medication use. *Journal of the American Psychiatric Nurses Association, 14*(1), 39-49.

Smith, M., Samus, Q. M., Steele, C., Baker, A., Brandt, J., Rabins, P. V., . . . Rosenblatt, A. (2008). Anxiety symptoms among assisted living residents: implications of

the "no difference" finding for participants with and without dementia. *Research in gerontological nursing, 1*(2), 97-104. doi: 10.3928/19404921-20080401-06

Snow, A. L., Huddleston, C., Robinson, C., Kunik, M. E., Bush, A. L., Wilson, N., . . . Stanley, M. A. (2012). Psychometric properties of a structured interview guide for the rating for anxiety in dementia. *Aging and Mental Health, 16*(5), 592-602. doi: 10.1080/13607863.2011.644518

Spielberger, C. D., Gorush, R. L. L., R., Vagg, P., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory STAI (Form Y): Self-Evaluation Questionnaire*. Palo Alto, CA: Consulting Psychologists Press.

Spinhoven, P., Ormel, J., Sloekers, P. P. A., Kempen, G. I. J. M., Speckens, A. E. M., & Van Hemert, A. M. (1997). A validation study of the hospital anxiety and depression scale (HADS) in different groups of Dutch subjects. *Psychological Medicine, 27*(2), 363-370. doi: 10.1017/S0033291796004382

Spitzer, R. L., Williams, J. B. W., Gibbon, M., & First, M. (1990). *Structured Clinical Interview for DSM-III-R: Patient Edition*. Washington, DC: American Psychiatric Press.

Stanley, M. A., Beck, J. G., & Zebb, B. J. (1996). Psychometric properties of four anxiety measures in older adults. *Behaviour Research and Therapy, 34*(10), 827-838. doi: 10.1016/0005-7967(96)00064-2

Stanley, M. A., Novy, D. M., Bourland, S. L., Beck, J. G., & Averill, P. M. (2001). Assessing older adults with generalized anxiety: A replication and extension. *Behaviour Research and Therapy, 39*(2), 221-235. doi: 10.1016/S0005-7967(00)00030-9

Stargatt, J., Bhar, S. S., Davison, T. E., Pachana, N. A., Mitchell, L., Koder, D., . . . Helmes, E. (2017). The Availability of Psychological Services for Aged Care Residents in Australia: A Survey of Facility Staff. *Australian Psychologist, 52*(6), 406-413. doi: 10.1111/ap.12244

Streiner, D., & Cairney, J. (2007). What's under the ROC? An introduction to Receiver Operating Characteristic Curves. *The Canadian Journal of Psychiatry, 52*(2), 121-128. doi: 10.1177/070674370705200210

Sung, H., Chang, A. M., & Lee, W. (2010). A preferred music listening intervention to reduce anxiety in older adults with dementia in nursing homes. *Journal of Clinical Nursing, 19*(7/8), 1056-1064. doi: 10.1111/j.1365-2702.2009.03016.x

Sung, H., Lee, W. L., Li, T. L., & Watson, R. (2012). A group music intervention using percussion instruments with familiar music to reduce anxiety and agitation of

institutionalized older adults with dementia. *International Journal of Geriatric Psychiatry, 27*(6), 621-627. doi: 10.1002/gps.2761

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th ed.). Boston, MA: Pearson Education, Inc.

Therrien, Z., & Hunsley, J. (2012). Assessment of anxiety in older adults: A systematic review of commonly used measures. *Aging and Mental Health, 16*(1), 1-16. doi: 10.1080/13607863.2011.602960

Thomasma, M., Yeaworth, R. C., & McCabe, B. W. (1990). Moving day: relocation and anxiety in institutionalized elderly. *Journal of Gerontological Nursing, 16*(7), 18-25.

Togari, T., & Yonekura, Y. (2015). A Japanese version of the Pearlin and Schooler's Sense of Mastery Scale. *SpringerPlus, 4*, 399. doi: 10.1186/s40064-015-1186-1

Tolin, D. F., Robison, J. T., Gaztambide, S., & Blank, K. (2005). Anxiety disorders in older Puerto Rican primary care patients. *American Journal of Geriatric Psychiatry, 13*(2), 150-156. doi: 10.1176/appi.ajgp.13.2.150

Tombaugh, T. N., & McIntyre, N. J. (1992). The mini-mental state examination: a comprehensive review. *Journal of the American Geriatrics Society, 40*(9), 922-935.

Trollor, J. N., Anderson, T. M., Sachdev, P. S., Brodaty, H., & Andrews, G. (2007). Prevalence of mental disorders in the elderly: The Australian national mental health and well-being survey. *American Journal of Geriatric Psychiatry, 15*(6), 455-466. doi: 10.1097/JGP.0b013e3180590ba9

Twelftree, H., & Qazi, A. (2006). Relationship between anxiety and agitation in dementia. *Aging and Mental Health, 10*(4), 362-367. doi: 10.1080/13607860600638511

United Nations Population Fund. (2012). *Ageing in the Twenty-First Century: A Celebration and a Challenge*. New York, NY.

Van Almenkerk, S., Depla, M. F. I. A., Smalbrugge, M., Eefsting, J. A., & Hertogh, C. M. P. M. (2015). Pain among institutionalized stroke patients and its relation to emotional distress and social engagement. *International Journal of Geriatric Psychiatry, 30*(10), 1023-1031. doi: 10.1002/gps.4256

Van Balkom, A. J. L. M., Beekman, A. T. F., De Beurs, E., Deeg, D. J. H., Van Dyck, R., & Van Tilburg, W. (2000). Comorbidity of the anxiety disorders in a community-based older population in the Netherlands. *Acta Psychiatrica Scandinavica, 101*(1), 37-45. doi: 10.1034/j.1600-0447.2000.101001037.x

van Kooten, J., Delwel, S., Binnekade, T. T., Smalbrugge, M., van der Wouden, J. C., Perez, R. S., . . . Scherder, E. J. (2015). Pain in dementia: prevalence and associated factors: protocol of a multidisciplinary study. *BMC Geriatrics, 15*, 29. doi: 10.1186/s12877-015-0025-0

van Zelst, W. H., De Beurs, E., Beekman, A., van Dyck, R., & Deeg, D. (2006). Well-being, physical functioning, and use of health services in the elderly with PTSD and subthreshold PTSD. *International Journal of Geriatric Psychiatry, 21*(2), 180-188. doi: 10.1002/gps.1448

Versi, E. (1992). "Gold-standard" is an appropriate term. *British Medical Journal, 305*(6846), 187.

Vink, D., Aartsen, M. J., Comijs, H. C., Heymans, M. W., Penninx, B. W. J. H., Stek, M. L., . . . Beekman, A. T. F. (2009). Onset of anxiety and depression in the aging population: Comparison of risk factors in a 9-year prospective study. *American Journal of Geriatric Psychiatry, 17*(8), 642-652. doi: 10.1097/JGP.0b013e3181a65228

Vink, D., Aartsen, M. J., & Schoevers, R. A. (2008). Risk factors for anxiety and depression in the elderly: A review. *Journal of Affective Disorders, 106*(1-2), 29-44. doi: 10.1016/j.jad.2007.06.005

Voyer, P., Verreault, R., Mengue, P. N., & Morin, C. M. (2006). Prevalence of insomnia and its associated factors in elderly long-term care residents. *Archives of Gerontology and Geriatrics, 42*(1), 1-20. doi: 10.1016/j.archger.2005.06.008

Walker, H., & Paliadelis, P. (2016). Older peoples' experiences of living in a residential aged care facility in Australia. *Australasian Journal on Ageing, 35*(3), E6-E10. doi: 10.1111/ajag.12325

Walid, M. S., & Zaytseva, N. (2009). Pain in nursing home residents and correlation with neuropsychiatric disorders. *Pain Physician, 12*(5), 877-880.

Ward, L. C., Wadsworth, A. P., & Peterson, L. P. (1994). Concurrent Validity of Measures of Anxiety, Depression, and Somatization in Elderly, Demented, Male Patients. *Clinical Gerontologist, 15*(1), 3-13. doi: 10.1300/J018v15n01_02

Warner, J., McCarney, R., Griffin, M., Hill, K., & Fisher, P. (2008). Participation in dementia research: Rates and correlates of capacity to give informed consent. *Journal of Medical Ethics, 34*(3), 167-170. doi: 10.1136/jme.2006.019786

Weissman, M. M., Myers, J. K., Tischler, G. L., Holzer Iii, C. E., Leaf, P. J., Orvaschel, H., & Brody, J. A. (1985). Psychiatric disorders (DSM-III) and cognitive impairment among the elderly in a U.S. urban community. *Acta Psychiatrica Scandinavica,*

71(4), 366-379.

Wells, Y., Bhar, S., Kinsella, G., Kowalski, C., Merkes, M., Patchett, A., . . . van Holsteyn, J. (2014). What woks to promote emotional wellbeing in older people: A guide for aged care staff working in community or residential care settings. Melbourne: beyondblue.

Wenborn, J., Challis, D., Head, J., Miranda-Castillo, C., Popham, C., Thakur, R., . . . Orrell, M. (2013). Providing activity for people with dementia in care homes: a cluster randomised controlled trial. *International Journal of Geriatric Psychiatry, 28*(12), 1296-1304. doi: 10.1002/gps.3960

Wetherell, J. L., Gatz, M., & Pedersen, N. L. (2001). A longitudinal analysis of anxiety and depressive symptoms. *Psychology and Aging, 16*(2), 187-195. doi: 10.1037//0882-7974.16.2.187

Wolitzky-Taylor, K. B., Castriotta, N., Lenze, E. J., Stanley, M. A., & Craske, M. G. (2010). Anxiety disorders in older adults: A comprehensive review. *Depression and Anxiety, 27*(2), 190-211. doi: 10.1002/da.20653

World Health Organization. (1999). Schedules for Clinical Assessment in Neuropsychiatry (SCAN). In R. Giel & F. L. Nienhuis (Eds.), *SCAN 2.1; vragenschema's voor de klinische beoordeling in de neuropsychiatrie.* (Dutch ed.). Groningen: Swets and Zeitlinger.

Yoon, J. Y., & Kim, H. (2016). The Revised Index for Social Engagement in Long-Term Care Facilities: A Psychometric Study. *Journal of Nursing Research*. doi: 10.1097/jnr.0000000000000156

Zhang, X., Norton, J., Carrière, I., Ritchie, K., Chaudieu, I., & Ancelin, M. L. (2015). Generalized anxiety in community-dwelling elderly: Prevalence and clinical characteristics. *Journal of Affective Disorders, 172*, 24-29. doi: 10.1016/j.jad.2014.09.036

Zigmond, A., & Snaith, R. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica, 67*(6), 361-370.

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30-41.

Zimet, G. D., S., P. S., Farley, G. K., Werkman, S., & Berkoff, K. A. (1990). Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 53*(3&4), 610-617.

Zuidema, S. U., Derksen, E., Verhey, F. R. J., & Koopmans, R. T. C. M. (2007). Prevalence

of neuropsychiatric symptoms in a large sample of Dutch nursing home patients with dementia. *International Journal of Geriatric Psychiatry, 22*(7), 632-638. doi: 10.1002/gps.1722

Zuidema, S. U., De Jonghe, J. F. M., Verhey, F. R. J., & Koopmans, R. T. C. M. (2009). Predictors of neuropsychiatric symptoms in nursing home patients: Influence of gender and dementia severity. *International Journal of Geriatric Psychiatry, 24*(10), 1079-1086. doi: 10.1002/gps.2225

APPENDICES

APPENDIX A:

License to Reproduce Paper Entitled 'The Prevalence of Anxiety among Older Adults in Nursing Homes and other Residential Aged Care Facilities: A Systematic Review'

JOHN WILEY AND SONS LICENSE
TERMS AND CONDITIONS
Sep 10, 2017

This Agreement between Alexandra Creighton ("You") and John Wiley and Sons ("John Wiley and Sons") consists of your license details and the terms and conditions provided by John Wiley and Sons and Copyright Clearance Center.

License Number	4185691190679
License date	Sep 10, 2017
Licensed Content Publisher	John Wiley and Sons
Licensed Content Publication	International Journal of Geriatric Psychiatry
Licensed Content Title	The prevalence of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review
Licensed Content Author	Alexandra S. Creighton, Tanya E. Davison, David W. Kissane
Licensed Content Date	Nov 9, 2015
Licensed Content Pages	12
Type of use	Dissertation/Thesis
Requestor type	Author of this Wiley article
Format	Print and electronic
Portion	Full article
Will you be translating?	No
Title of your thesis / dissertation	An Examination of Anxiety among Older Adults in Residential Care
Expected completion date	Dec 2017
Expected size (number of pages)	200
Requestor Location	Alexandra Creighton
	Level 3, P Block
	Monash Medical Centre
	256 Clayton Road
	Clayton, VIC 3168
	Australia
	Attn: Alexandra Creighton
Publisher Tax ID	EU826007151
Billing Type	Invoice
Billing Address	Alexandra Creighton
	Level 3, P Block
	Monash Medical Centre
	256 Clayton Road
	Clayton, Australia 3168
	Attn: Alexandra Creighton
Total	0.00 AUD
Terms and Conditions	

TERMS AND CONDITIONS

MERCHANTABILITY, ACCURACY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, USABILITY, INTEGRATION OR NON-INFRINGEMENT AND ALL SUCH WARRANTIES ARE HEREBY EXCLUDED BY WILEY AND ITS LICENSORS AND WAIVED BY YOU.

- WILEY shall have the right to terminate this Agreement immediately upon breach of this Agreement by you.

- You shall indemnify, defend and hold harmless WILEY, its Licensors and their respective directors, officers, agents and employees, from and against any actual or threatened claims, demands, causes of action or proceedings arising from any breach of this Agreement by you.

- IN NO EVENT SHALL WILEY OR ITS LICENSORS BE LIABLE TO YOU OR ANY OTHER PARTY OR ANY OTHER PERSON OR ENTITY FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY OR PUNITIVE DAMAGES, HOWEVER CAUSED, ARISING OUT OF OR IN CONNECTION WITH THE DOWNLOADING, PROVISIONING, VIEWING OR USE OF THE MATERIALS REGARDLESS OF THE FORM OF ACTION, WHETHER FOR BREACH OF CONTRACT, BREACH OF WARRANTY, TORT, NEGLIGENCE, INFRINGEMENT OR OTHERWISE (INCLUDING, WITHOUT LIMITATION, DAMAGES BASED ON LOSS OF PROFITS, DATA, FILES, USE, BUSINESS OPPORTUNITY OR CLAIMS OF THIRD PARTIES), AND WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY PROVIDED HEREIN.

- Should any provision of this Agreement be held by a court of competent jurisdiction to be illegal, invalid, or unenforceable, that provision shall be deemed amended to achieve as nearly as possible the same economic effect as the original provision, and the legality, validity and enforceability of the remaining provisions of this Agreement shall not be affected or impaired thereby.

- The failure of either party to enforce any term or condition of this Agreement shall not constitute a waiver of either party's right to enforce each and every term and condition of this Agreement. No breach under this agreement shall be deemed waived or excused by either party unless such waiver or consent is in writing signed by the party granting such waiver or consent. The waiver by or consent of a party to a breach of any provision of this Agreement shall not operate or be construed as a waiver of or consent to any other or subsequent breach by such other party.

- This Agreement may not be assigned (including by operation of law or otherwise) by you without WILEY's prior written consent.

- Any fee required for this permission shall be non-refundable after thirty (30) days from receipt by the CCC.

- These terms and conditions together with CCC's Billing and Payment terms and conditions (which are incorporated herein) form the entire agreement between you and WILEY concerning this licensing transaction and (in the absence of fraud) supersedes all prior agreements and representations of the parties, oral or written. This Agreement may not be amended except in writing signed by both parties. This Agreement shall be binding upon and inure to the benefit of the parties' successors, legal representatives, and authorized assigns.

- In the event of any conflict between your obligations established by these terms and conditions and those established by CCC's Billing and Payment terms and conditions, these terms and conditions shall prevail.

- WILEY expressly reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this licensing transaction, (ii) these terms and conditions and (iii) CCC's Billing and Payment terms and conditions.

- This Agreement will be void if the Type of Use, Format, Circulation, or Requestor Type was misrepresented during the licensing process.

- This Agreement shall be governed by and construed in accordance with the laws of the State of New York, USA, without regards to such state's conflict of law rules. Any legal action, suit or proceeding arising out of or relating to these Terms and Conditions or the breach thereof shall be instituted in a court of competent jurisdiction in New York County in the State of New York in the United States of America and each party hereby consents and submits to the personal jurisdiction of such court, waives any objection to venue in such court and consents to service of process by registered or certified mail, return receipt requested, at the last known address of such party.

WILEY OPEN ACCESS TERMS AND CONDITIONS
Wiley Publishes Open Access Articles in fully Open Access Journals and in Subscription journals offering Online Open. Although most of the fully Open Access journals publish open access articles under the terms of the Creative Commons Attribution (CC BY) License only, the subscription journals and a few of the Open Access Journals offer a choice of Creative Commons Licenses. The license type is clearly identified on the article.
The Creative Commons Attribution License
The Creative Commons Attribution License (CC-BY) allows users to copy, distribute and transmit an article, adapt the article and make commercial use of the article. The CC-BY license permits commercial and non-
Creative Commons Attribution Non-Commercial License
The Creative Commons Attribution Non-Commercial (CC-BY-NC) License permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes. (see below)

Creative Commons Attribution-Non-Commercial-NoDerivs License
The Creative Commons Attribution Non-Commercial-NoDerivs License (CC-BY-NC-ND) permits use, distribution and reproduction in any medium, provided the original work is properly cited, is not used for commercial purposes and no modifications or adaptations are made. (see below)
Use by commercial "for-profit" organizations
Use of Wiley Open Access articles for commercial, promotional, or marketing purposes requires further explicit permission from Wiley and will be subject to a fee.
Further details can be found on Wiley Online Library http://olabout.wiley.com/WileyCDA/Section/id-410895.html

Other Terms and Conditions:

v1.10 Last updated September 2015
Questions? ████████████████████████
████████

APPENDIX B:

License to Reproduce Paper Entitled 'The Correlates of Anxiety among Older Adults in Nursing Homes and Other Residential Aged Care Facilities: A Systematic Review'

**JOHN WILEY AND SONS LICENSE
TERMS AND CONDITIONS**

Sep 14, 2017

This Agreement between Alexandra Creighton ("You") and John Wiley and Sons ("John Wiley and Sons") consists of your license details and the terms and conditions provided by John Wiley and Sons and Copyright Clearance Center.

License Number	4187550167593
License date	Sep 14, 2017
Licensed Content Publisher	John Wiley and Sons
Licensed Content Publication	International Journal of Geriatric Psychiatry
Licensed Content Title	The correlates of anxiety among older adults in nursing homes and other residential aged care facilities: a systematic review
Licensed Content Author	Alexandra S. Creighton, Tanya E. Davison, David W. Kissane
Licensed Content Date	Oct 17, 2016
Licensed Content Pages	14
Type of use	Dissertation/Thesis
Requestor type	Author of this Wiley article
Format	Print and electronic
Portion	Full article
Will you be translating?	No
Title of your thesis / dissertation	An Examination of Anxiety among Older Adults in Residential Care
Expected completion date	Dec 2017
Expected size (number of pages)	200
Requestor Location	Alexandra Creighton █████████ ███████████████ ████████████ ██████████ Australia Attn: Alexandra Creighton
Publisher Tax ID	EU826007151
Billing Type	Invoice

Billing Address	Alexandra Creighton
	███████████
	███████████████
	█████████████
	█████████████
	Attn: Alexandra Creighton
Total	0.00 AUD
Terms and Conditions	

TERMS AND CONDITIONS

This copyrighted material is owned by or exclusively licensed to John Wiley & Sons, Inc. or one of its group companies (each a "Wiley Company") or handled on behalf of a society with which a Wiley Company has exclusive publishing rights in relation to a particular work (collectively "WILEY"). By clicking "accept" in connection with completing this licensing transaction, you agree that the following terms and conditions apply to this transaction (along with the billing and payment terms and conditions established by the Copyright Clearance Center Inc., ("CCC's Billing and Payment terms and conditions"), at the time that you opened your RightsLink account (these are available at any time at http://myaccount.copyright.com).

Terms and Conditions

- The materials you have requested permission to reproduce or reuse (the "Wiley Materials") are protected by copyright.

- You are hereby granted a personal, non-exclusive, non-sub licensable (on a stand-alone basis), non-transferable, worldwide, limited license to reproduce the Wiley Materials for the purpose specified in the licensing process. This license, **and any CONTENT (PDF or image file) purchased as part of your order,** is for a one-time use only and limited to any maximum distribution number specified in the license. The first instance of republication or reuse granted by this license must be completed within two years of the date of the grant of this license (although copies prepared before the end date may be distributed thereafter). The Wiley Materials shall not be used in any other manner or for any other purpose, beyond what is granted in the license. Permission is granted subject to an appropriate acknowledgement given to the author, title of the material/book/journal and the publisher. You shall also duplicate the copyright notice that appears in the Wiley publication in your use of the Wiley Material. Permission is also granted on the understanding that nowhere in the text is a previously published source acknowledged for all or part of this Wiley Material. Any third party content is expressly excluded from this permission.

- With respect to the Wiley Materials, all rights are reserved. Except as expressly granted by the terms of the license, no part of the Wiley Materials may be copied, modified, adapted (except for minor reformatting required by the new Publication), translated, reproduced, transferred or distributed, in any form or by any means, and no derivative works may be made based on the Wiley Materials without the prior permission of the respective copyright owner. **For STM Signatory Publishers clearing permission under the terms of the STM Permissions Guidelines only, the terms of the license are extended to include subsequent editions and for editions in other languages, provided such editions are for the work as a whole in situ and does not involve the separate exploitation of the permitted figures or extracts,** You may not alter, remove or suppress in any manner any copyright, trademark or other notices displayed by the Wiley Materials. You may not license, rent, sell, loan, lease, pledge, offer as security, transfer or assign the Wiley Materials on a stand-alone basis, or any of the rights granted to you hereunder to any other person.

- The Wiley Materials and all of the intellectual property rights therein shall at all times remain the exclusive property of John Wiley & Sons Inc, the Wiley Companies, or their respective licensors, and your interest therein is only that of having possession of and the right to reproduce the Wiley Materials pursuant to Section 2 herein during the continuance of this Agreement. You agree that you own no right, title or interest in or to the Wiley Materials or any of the intellectual property rights therein. You shall have no rights hereunder other than

the license as provided for above in Section 2. No right, license or interest to any trademark, trade name, service mark or other branding ("Marks") of WILEY or its licensors is granted hereunder, and you agree that you shall not assert any such right, license or interest with respect thereto

- NEITHER WILEY NOR ITS LICENSORS MAKES ANY WARRANTY OR REPRESENTATION OF ANY KIND TO YOU OR ANY THIRD PARTY, EXPRESS, IMPLIED OR STATUTORY, WITH RESPECT TO THE MATERIALS OR THE ACCURACY OF ANY INFORMATION CONTAINED IN THE MATERIALS, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF MERCHANTABILITY, ACCURACY, SATISFACTORY QUALITY, FITNESS FOR A PARTICULAR PURPOSE, USABILITY, INTEGRATION OR NON-INFRINGEMENT AND ALL SUCH WARRANTIES ARE HEREBY EXCLUDED BY WILEY AND ITS LICENSORS AND WAIVED BY YOU.

- WILEY shall have the right to terminate this Agreement immediately upon breach of this Agreement by you.

- You shall indemnify, defend and hold harmless WILEY, its Licensors and their respective directors, officers, agents and employees, from and against any actual or threatened claims, demands, causes of action or proceedings arising from any breach of this Agreement by you.

- IN NO EVENT SHALL WILEY OR ITS LICENSORS BE LIABLE TO YOU OR ANY OTHER PARTY OR ANY OTHER PERSON OR ENTITY FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY OR PUNITIVE DAMAGES, HOWEVER CAUSED, ARISING OUT OF OR IN CONNECTION WITH THE DOWNLOADING, PROVISIONING, VIEWING OR USE OF THE MATERIALS REGARDLESS OF THE FORM OF ACTION, WHETHER FOR BREACH OF CONTRACT, BREACH OF WARRANTY, TORT, NEGLIGENCE, INFRINGEMENT OR OTHERWISE (INCLUDING, WITHOUT LIMITATION, DAMAGES BASED ON LOSS OF PROFITS, DATA, FILES, USE, BUSINESS OPPORTUNITY OR CLAIMS OF THIRD PARTIES), AND WHETHER OR NOT THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS LIMITATION SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OF ANY LIMITED REMEDY PROVIDED HEREIN.

- Should any provision of this Agreement be held by a court of competent jurisdiction to be illegal, invalid, or unenforceable, that provision shall be deemed amended to achieve as nearly as possible the same economic effect as the original provision, and the legality, validity and enforceability of the remaining provisions of this Agreement shall not be affected or impaired thereby.

- The failure of either party to enforce any term or condition of this Agreement shall not constitute a waiver of either party's right to enforce each and every term and condition of this Agreement. No breach under this agreement shall be deemed waived or excused by either party unless such waiver or consent is in writing signed by the party granting such waiver or consent. The waiver by or consent of a party to a breach of any provision of this Agreement shall not operate or be construed as a waiver of or consent to any other or subsequent breach by such other party.

- This Agreement may not be assigned (including by operation of law or otherwise) by you without WILEY's prior written consent.

- Any fee required for this permission shall be non-refundable after thirty (30) days from receipt by the CCC.

- These terms and conditions together with CCC's Billing and Payment terms and conditions (which are incorporated herein) form the entire agreement between you and WILEY

concerning this licensing transaction and (in the absence of fraud) supersedes all prior agreements and representations of the parties, oral or written. This Agreement may not be amended except in writing signed by both parties. This Agreement shall be binding upon and inure to the benefit of the parties' successors, legal representatives, and authorized assigns.

- In the event of any conflict between your obligations established by these terms and conditions and those established by CCC's Billing and Payment terms and conditions, these terms and conditions shall prevail.

- WILEY expressly reserves all rights not specifically granted in the combination of (i) the license details provided by you and accepted in the course of this licensing transaction, (ii) these terms and conditions and (iii) CCC's Billing and Payment terms and conditions.

- This Agreement will be void if the Type of Use, Format, Circulation, or Requestor Type was misrepresented during the licensing process.

- This Agreement shall be governed by and construed in accordance with the laws of the State of New York, USA, without regards to such state's conflict of law rules. Any legal action, suit or proceeding arising out of or relating to these Terms and Conditions or the breach thereof shall be instituted in a court of competent jurisdiction in New York County in the State of New York in the United States of America and each party hereby consents and submits to the personal jurisdiction of such court, waives any objection to venue in such court and consents to service of process by registered or certified mail, return receipt requested, at the last known address of such party.

WILEY OPEN ACCESS TERMS AND CONDITIONS
Wiley Publishes Open Access Articles in fully Open Access Journals and in Subscription journals offering Online Open. Although most of the fully Open Access journals publish open access articles under the terms of the Creative Commons Attribution (CC BY) License only, the subscription journals and a few of the Open Access Journals offer a choice of Creative Commons Licenses. The license type is clearly identified on the article.
The Creative Commons Attribution License
The Creative Commons Attribution License (CC-BY) allows users to copy, distribute and transmit an article, adapt the article and make commercial use of the article. The CC-BY license permits commercial and non-
Creative Commons Attribution Non-Commercial License
The Creative Commons Attribution Non-Commercial (CC-BY-NC)License permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.(see below)

Creative Commons Attribution-Non-Commercial-NoDerivs License
The Creative Commons Attribution Non-Commercial-NoDerivs License (CC-BY-NC-ND) permits use, distribution and reproduction in any medium, provided the original work is properly cited, is not used for commercial purposes and no modifications or adaptations are made. (see below)
Use by commercial "for-profit" organizations
Use of Wiley Open Access articles for commercial, promotional, or marketing purposes requires further explicit permission from Wiley and will be subject to a fee.
Further details can be found on Wiley Online Library http://olabout.wiley.com/WileyCDA/Section/id-410895.html

Other Terms and Conditions:

v1.10 Last updated September 2015

Questions? ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

APPENDIX C:

Permission Letter Signed by Facility Manager or Director of Nursing Allowing the Study to be conducted at the Aged Care Facility

PERMISSION LETTER

Project: An Examination of Anxiety among Older Adults in Residential Care

Professor David Kissane
Department of Psychiatry
Monash Medical Centre
█████████████

Dear Professor David Kissane,

Thank you for your request to recruit participants from _____
for the above-named research.

I have read and understood the Explanatory Statement regarding the research project
(CF14/3346 – 2014001779: An Examination of Anxiety among Older Adults in Residential Care) and hereby give permission for this research to be conducted within this facility.

Yours sincerely,

_____
(Signature of person granting permission)

_____
Date

_____
(Name of person granting permission)

_____
(Position of person granting permission)

APPENDIX D:

Permission Provided by Professor David Sheehan to use the MINI 7.0.0 in the Research Study

From: **Sheehan, David** ██████████████████████
Date: 14 January 2015 at 08:09
Subject: Re: Purchase M.I.N.I-Plus V.6.0
To: "██████████████████████████████

Dear Alex,

Attached is a copy of the MINI 7 and the MINI 7 for Psychotic Disorders (both for DSM-5).

You have my permission to use the paper based version of the MINIs in your personal dissertation and clinical work free of charge.

With best regards,
David
David V. Sheehan MD MBA
Distinguished University Health Professor Emeritus
University of South Florida College of Medicine

█████████████████████

████████████████████████

███████████████████████████

APPENDIX E:

Scoring Rules for the RAID (Snow et al., 2012)

The rating scale is 0 – 3. You should use your best clinical judgment to make the determination as to which score best fits, based upon the verbal descriptors, which are consistent throughout the items (i.e., absent=0; mild or intermittent = 1; moderate = 2; severe = 3).

The following table may help you think about how you combine Frequency, Distress, and Interference information to determine the total score. Obviously, these are just guides to help give you an idea of the differences between a 1, 2, and 3. This table does not cover every possible combination of verbal descriptors you will hear in your assessments. Ultimately, you must use your own clinical judgment regarding what a Mild (1), Moderate (2), and Severe (3) score should be.

SCORING RULE: If in doubt between two scores, always use the higher score.

Distress/Interference	Frequency	Score
None...AND:	None	0
Present/Mild..AND:	Present/Less than 50%	1
Mild...AND:	>50%	
Moderate...AND:	<=50%	2
Moderate...AND:	>75%	
Severe...AND:	>50%	3

Here are some guides to show how some of the verbal descriptors commonly used by patients map on to frequency percentages:

100%   Constantly
75%   Several Times a Day
50%   Every Day
<50%   Several Times a Week
<25%   1–2 Times a Week

• Please note that it is very important to differentiate every day from several times a day to make accurate scoring decisions. Most individuals tend to use the words every day, so you'll have to make sure to always follow-up on this response by asking, "Does it happen several times a day, or just sometime every day?"
• Raters often find it more challenging to differentiate between mild/moderate and moderate/severe distress than to determine frequency or make other differentiations. Participants often describe distress in ambiguous terms, such as, "It upsets me a lot" (could be moderate or severe, depending upon the context), or "I do find that upsetting." Note that, at certain levels of frequency, making these distress differentiations is very important; and, at other levels of frequency, such differentiations are less important. Be sure to ask enough follow-up questions to be able to clearly determine when such differentiations are important.

APPENDIX F:

Monash University Human Ethics Committee Certificate of Approval

MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

This is to certify that the project below was considered by the Monash University Human Research Ethics Committee. The Committee was satisfied that the proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and has granted approval.

Project Number:	CF14/3346 - 2014001779
Project Title:	An Examination of Anxiety among Older Adults in Residential Care
Chief Investigator:	Prof Daniel O'Connor
Approved:	**From:** 16 January 2015 **To:** 16 January 2020

Terms of approval - *Failure to comply with the terms below is in breach of your approval and the Australian Code for the Responsible Conduct of Research.*

1. The Chief investigator is responsible for ensuring that permission letters are obtained, <u>if relevant</u>, before any data collection can occur at the specified organisation.
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must include your project number.
6. Amendments to the approved project (including changes in personnel): Require the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. Future correspondence: Please quote the project number and project title above in any further correspondence.
8. Annual reports: Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. Final report: A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. Monitoring: Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. Retention and storage of data: The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.
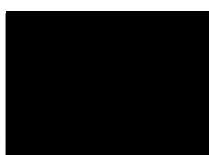
Professor Nip Thomson
Chair, MUHREC

cc: Dr Tanya Davison, Ms Alexandra Creighton

APPENDIX G:

Explanatory Statement for Potential Participants

MONASH University

EXPLANATORY STATEMENT

FOR STUDY PARTICIPANTS

Project: An Examination of Anxiety among Older Adults in Residential Care

Professor David Kissane
Department of Psychiatry

Alexandra Creighton

You are invited to take part in this study, which is being completed by Alexandra Creighton as part of the Doctor of Clinical Psychology degree. Please read this Explanatory Statement in full before deciding whether or not to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact Ms. Creighton via the phone number or email address listed above.

What does the research involve?
The purpose of this research project is to: (a) find out how common anxiety disorders are in nursing homes, (b) examine what factors are associated with the presence of anxiety disorders, and (c) determine the best way to assess for anxiety in nursing homes. We would like to interview all eligible residents, including those with and without anxiety.

If you decide you would like to take part in the project, the researchers will first visit you in the nursing home where you currently live and introduce themselves. The researchers will also spend some time with you completing a cognitive screening questionnaire to determine your eligibility to participate in an interview.

If you are considered eligible to participate, and you give consent, the researcher will complete a semi-structured interview with you where you will answer questions about the following: your current experience of any anxiety or depression symptoms; your levels of social support; how you rate your health; how much control you feel you have over your own life; and whether or not you have experienced a recent life event. The researcher will also access your file at the nursing home to obtain basic demographic and health information, including medications prescribed to determine if you are being treated for anxiety.

MONASH University

You will be asked for a maximum of three hours of your time, spread over two to three sessions (depending on what you would prefer), with these sessions being held in a private room at the facility where you reside. All sessions will be held within one week. A staff member who is familiar with you will also be asked to answer questions about your daily living activities, level of social engagement, and anxiety level.

Why were you chosen for this research?
You have been selected to participate in this research because you are a resident of an aged care facility in Melbourne. We have been able to invite you to participate in this research because the manager of the facility where you currently reside has agreed to have the facility take part in this project.

Consenting to participate in the project and withdrawing from the research
Participation in any research project is voluntary, and you are under no obligation to take part in this study. You will continue to receive the best care possible whether you take part in the research project or not. If you do decide to consent to participation and then later change your mind, you are free to withdraw from the project at any stage prior to the submission of the thesis. Withdrawal from the project will have no negative effects or influence on any subsequent treatment. If you do decide you would like to withdraw from this project, please notify one of the researchers before you withdraw.

If you decide you would like to take part in this research project, you will be asked to sign and return the consent form. By signing it you are telling us that you:
- understand what you have read on this Explanatory Statement;
- consent to taking part in the research project;
- consent to participating in the research processes that are described;
- consent to the use of your personal and health information as described;
- consent to your data being used by researchers at Monash University's Aged Mental Health Research Unit in future research projects.

Possible benefits and risks to participants
While we cannot promise that you will receive any direct benefit from participating in this research, our previous experiences of this kind of research suggests that most residents enjoy the interviews with a researcher. From a general perspective, the findings from this project will contribute to our knowledge of anxiety in nursing homes, and help determine how best to assess for anxiety, and whether it is recognised and treated in nursing homes. This will help us to improve the detection

MONASH University

and management of anxiety in the nursing home population, as well as aid in the development of effective interventions and prevention strategies.

Apart from the time commitment for completion of the cognitive screening test and interview, this research project is not likely to cause inconvenience or discomfort. If at any stage during the project you do not wish to be involved, we will respect this.

If after completing the interview we believe you are feeling significantly anxious or depressed, we strongly encourage you to speak to your GP, a member of the nursing staff, or inform your family of the symptoms that you reported in the interview. We are also happy to contact the nursing staff, your GP, or a family member to discuss the assessment on your behalf, with your consent. A list of counselling services has also been provided below:

Counselling services

Counselling Service	Contact Details
Lifeline	13 11 14 (available 24 hours a day)
GriefLine	1300 854 745 (available from 12pm to 3am every day)
Anxiety Recovery Centre Victoria	1300 269 438 (available Monday to Friday, 10am to 4pm)
SANE Helpline	1800 187 263 (available Monday to Friday, 9am to 5pm)

Confidentiality

Any information obtained in connection with this research project that can identify you will remain confidential and will only be used for the purpose of this research project. It will only be disclosed with your permission, except as required by law.

Information will be obtained from your health records held at the nursing home where you currently reside, and other health services for the purposes of this research. However, each participant will be assigned a code to keep all data

MONASH University

anonymous. In the thesis, any publication and/or conference presentation, information will be provided in such a way that you cannot be identified.

Storage of data
Written information collected for this research project will be stored in locked filing cabinets at the Aged Mental Health Research Unit, Kingston Centre for <u>seven years from the end of this study</u>. Only the researchers will have access to it. You may access your information if you wish.

Use of data for other purposes
Where ethics approval has been granted, the aggregate (total group) de-identified data may be used for other future projects.

Results
If you would like to be informed of the aggregate research findings, please contact Alexandra Creighton on ███████████ or email ███████████

Complaints
Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the
Executive Officer, Monash University Human Research Ethics (MUHREC):

Executive Officer
Monash University Human Research Ethics Committee (MUHREC)
███████████
Research Office
Monash University VIC 3800
Tel: ███████   Email ███████████
Fax: ███████

Thank you,

Professor David Kissane

APPENDIX H:

Consent Form for Study Participants
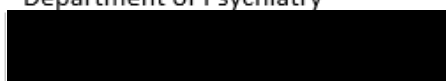
MONASH University

CONSENT FORM

FOR STUDY PARTICIPANTS

Project: An Examination of Anxiety among Older Adults in Residential Care

Chief Investigator: **Professor David Kissane**
Department of Psychiatry

███████████████████████

I have been asked to take part in the Monash University research project specified above. I have read and understood the Explanatory Statement or had the study explained to me and I hereby consent to participate in this project.

I understand that participation is voluntary and that I can withdraw at any stage of the project, prior to the submission of the thesis, without being disadvantaged in any way.

I consent to the following:	Yes	No
To participate in the research project and the research processes that are described in the Explanatory Statement.	☐	☐
For my doctors and other health professionals to release information to Monash University concerning my personal and health status that is needed for this project.	☐	☐
For the data collected during this research to be used by researchers at Monash University's Aged Mental Health Research Unit/Department of Psychiatry in future research projects.	☐	☐

Name of Participant _____

Participant Signature _____ Date _____

APPENDIX I:

Explanatory Statement for Person Responsible for Potential Participants

MONASH University

EXPLANATORY STATEMENT

FOR THE PERSON RESPONSIBLE FOR STUDY PARTICIPANTS

Project: An Examination of Anxiety among Older Adults in Residential Care

Professor David Kissane	Alexandra Creighton
Department of Psychiatry	

We would like to invite your relative (the person for whom you are responsible) to take part in this study, which is being completed by Alexandra Creighton as part of the Doctor of Clinical Psychology degree. Please read this Explanatory Statement in full before deciding whether or not to you would like them to participate in this research. If you would like further information regarding any aspect of this project, you are encouraged to contact Ms. Creighton via the phone number or email address listed above.

What does the research involve?

The purpose of this research project is to: (a) find out how common anxiety disorders are in nursing homes, (b) examine what factors are associated with the presence of anxiety disorders, and (c) determine the best way to assess for anxiety in nursing homes. We would like to interview all eligible residents, including those with and without anxiety.

If you decide you would like your relative to take part in the project, the researchers will first visit the nursing home where your relative currently lives and introduce themselves. The researchers will also spend some time with your relative completing a cognitive screening questionnaire to determine if they are eligible to participate in an interview.

If your relative is considered eligible, and you give consent, the researcher will complete a semi-structured interview with them, where they will answer questions about the following: their current experience of any anxiety or depression symptoms; their levels of social support; how they rate their health; how much control they feel they have over their own life; and whether or not they have experienced a recent life event. The researcher will also access your relative's file at the nursing home to obtain basic demographic and health information, including medications prescribed to determine if they are being treated for anxiety.

Each participant will be asked for a maximum of three hours of their time, spread over two to three sessions (depending on what your relative would prefer), with these session being held in a private room at your relative's nursing home within one week. A staff member from the facility where your relative currently resides will also be asked to answer questions about your relative's daily living activities, level of social engagement, and anxiety level.

Why was your relative chosen for this research?

Your relative has been selected because he/she is a resident of an aged care facility in Melbourne. With your permission, the facility manager where your relative currently lives has provided us with your contact details so that we can provide you with further information about the study.

Consenting to participate in the project and withdrawing from the research

As the 'person responsible', you are invited to consider your relative's participation in this research project. Victorian law allows the person responsible to consent for an individual to take part in medical research where the patient is unable to provide consent themselves.

MONASH University

Participation in any research project is voluntary, and you are under no obligation to provide consent for your relative to participate. Your relative will continue to receive the best care possible whether he/she takes part in the research project or not. If you do decide to consent to participation and then later change your mind, you are free to withdraw your relative from the project at any stage prior to the submission of the thesis. Withdrawal from the project will have no negative effects or influence on any subsequent treatment. If you do decide you would like to withdraw from this project, please notify one of the researchers before you withdraw.

If you decide you would like your relative to take part in this research project, you will be asked to sign and return the consent form. By signing it you are telling us that you:
- understand what you have read on this Explanatory Statement;
- consent to your relative taking part in the research project;
- consent to your relative participating in the research processes that are described;
- consent to the use of your relative's personal and health information as described;
- consent to your relative's data being used by researchers at Monash University's Aged Mental Health Research Unit in future research projects.

Possible benefits and risks to participants

While we cannot promise that your relative will receive any direct benefit from participating in this research, our previous experiences of this kind of research suggests that most aged care residents enjoy the interviews with a researcher. From a more general perspective the findings from this project will contribute to our knowledge of anxiety in nursing homes, as well as help determine how best to assess for anxiety, and whether it is recognised and treated in nursing homes. This will help us to improve the detection and management of anxiety for those living in a nursing home, as well as aid in the development of effective interventions and prevention strategies.

Apart from the time commitment for completion of the cognitive screening test and interview, this research project is not likely to cause inconvenience or discomfort to your relative. If at any stage during the project your relative does not wish to be involved, we will respect this.

If after completing the interview we believe your relative is significantly anxious or depressed, we will strongly encourage them to speak to their GP, a member of the nursing staff, or inform their family of the symptoms they reported in the interview. We will also offer to contact nursing staff, their GP, or a family member to discuss the assessment on their behalf, with their consent. A list of counselling services has also been provided below:

Counselling services

Counselling Service	Contact Details
Lifeline	13 11 14 (available 24 hours a day)
GriefLine	1300 854 745 (available from 12pm to 3am every day)
Anxiety Recovery Centre Victoria	1300 269 438 (available Monday to Friday, 10am to 4pm)
SANE Helpline	1800 187 263 (available Monday to Friday, 9am to 5pm)

MONASH University

Confidentiality
Any information obtained in connection with this research project that can identify your relative will remain confidential and will only be used for the purpose of this research project. It will only be disclosed with your permission, except as required by law.

Information about your relative may be obtained from his/her health records held at the nursing home where they currently reside, and other health services for the purposes of this research. However, each participant will be assigned a code to keep all data anonymous. In the thesis, any publication and/or conference presentation, information will be provided in such a way that your relative cannot be identified.

Storage of data
Written information collected for this research project will be stored in locked filing cabinets at the Aged Mental Health Research Unit, Kingston Centre for seven years from the end of this study. Only the researchers will have access to it. You may access your information if you wish.

Use of data for other purposes
Where ethics approval has been granted, the aggregate (total group) de-identified data may be used for other future projects.

Results
If you would like to be informed of the aggregate research findings, please contact Alexandra Creighton on (03) 9265 1714 or email Alexandra.Creighton@monash.edu.

Complaints
Should you have any concerns or complaints about the conduct of the project, you are welcome to contact the Executive Officer, Monash University Human Research Ethics (MUHREC):

Executive Officer
Monash University Human Research Ethics Committee (MUHREC)
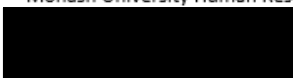
Thank you,

Professor David Kissane

APPENDIX J:

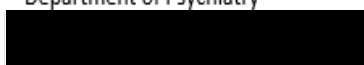**Consent Form for Person Responsible for Potential Participants**

MONASH University

CONSENT FORM

FOR THE PERSON RESPONSIBLE FOR STUDY PARTICIPANTS

Project: An Examination of Anxiety among Older Adults in Residential Care

Chief Investigator: **Professor David Kissane**
Department of Psychiatry

Verbal consent has been obtained by [Person Responsible's name] for [participant's name] to participate in the research project named above. They have had the study explained to them and understand that participation is voluntary and that they can withdraw the participant at any stage of the project, prior to the submission of the thesis, without being disadvantaged in any way.

I consent to the following:	Yes	No
For [participant's name] to participate in the research project and the research processes that are described in the Explanatory Statement.	☐	☐
For [participant's name]'s doctors, and other health professionals to release information to Monash University concerning [participant's name]'s personal and health status that is needed for this project (i.e., to access the participant's file that is held at the facility).	☐	☐
For the data collected during this project to be used by researchers at Monash University's Aged Mental Health Research Unit/Department of Psychiatry in future research projects.	☐	☐

Name of Participant: ....

Name of Person Responsible: ....

Relationship to Participant: ....

Signature: .... Date: ....