



# MONASH University

## **Promoting lifestyle changes for Chinese Australians with Type 2 diabetes**

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*Bachelor of Nutrition and Dietetics (Hons)*

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## Abstract

Type 2 diabetes is a progressive condition and a leading cause of illness, disability and premature death in Australia and world-wide. Chinese people living in Western societies are at increased risk of type 2 diabetes. Although diet and exercise intervention is an established cornerstone for promoting optimal glycemia, robust evidence on the most effective mode of delivery for diabetes self-management education to Chinese is lacking. Many Australian health professionals simply translate Western diabetes education for Chinese patients. This continues despite evidence suggesting translated programs contribute to stress, frustration and even anger among Chinese patients.

The thesis is designed to explore patterns of behaviours displayed by Chinese patients and their interactions with the health professionals during diabetes education, and to identify the most successful education approaches. This thesis comprises a systematic review and meta-analysis of current literature and a qualitative case study.

Results synthesised from review of 53 publications plus findings from 39 participant-observations and 22 interviews suggest that the most promising approach for diabetes education for Chinese patients is that delivered regularly in lecture-style. The research revealed a very different learning preference among Chinese that aligns with their Confucian cultural process of learning. Experienced health professionals were observed employing innovative strategies to support this learning orientation, including: avoiding participatory discussions during delivery of diabetes information; providing detailed prescriptive instructions on diabetes management; and allocating time to Questions-and-Answers at the end of session. Additionally, instead of establishing a therapeutic partnership that promotes autonomy and independence, a top-down paternalistic relationship was sought. This approach appears to better accommodate Chinese collectivistic cultural values and works better in promoting adoption of healthier lifestyle behaviours by Chinese patients. Health professionals were observed adopting an authoritative stance, actively disciplining patients to achieve lifestyle modifications. The Chinese patients appeared to believe that they could achieve behavioural change by the strength of individual willpower. Building strong trust from the early stages and encouraging rapport with Chinese patients by providing clear precisely instructive recommendations, before engaging them in an open-discussion of implementation strategies was observed to be the most effective approach to diabetes education. Finally, Chinese patients preferred to have their in-group people (family and close friends) implicitly providing support for their behaviour change. While a strong culture of information-sharing was common, which can be a community strength, it was noted that low-quality and potentially-misleading diabetes information shared within the community could result undesirable outcomes. Therefore, health professionals should establish trustworthy platforms to facilitate sharing of reputable diabetes management information.

The two final chapters of the thesis draw from all findings of this study to present a new paradigm of diabetes care and education for Chinese patients, and an implementation model to promote a practice change. Health professionals are urged to be flexible, moving away from translating the Western person-centred care approach to a collectivistic orientation top-down hierarchical approach when delivering care to Chinese patients because that is truly putting patients' needs in the centre of care.



## Presentations arising from the thesis

### Conference presentations

- **T Choi**, KZ Walker & C Palermo. A Different Person-Centred Diabetes Education For Chinese – *oral presentation at the 12th Australian Disease Management Association (ADMA) Annual National Conference, Melbourne, Australia, 20-21 Oct 2016*
- **T Choi**. Person-Centredness Before The Consultation: How to engage Chinese people in diabetes care? – *poster presentation at the 12th ADMA Annual National Conference, Melbourne, Australia, 20-21 Oct 2016*
- **T Choi**. The Chinese Australian Diabetes Journey – What do patients need? A qualitative research study – *oral presentation at the 33rd Dietitians Association of Australia (DAA) National Conference, Melbourne, Australia, 19-21 May 2016*
- **T Choi**, KZ Walker & C Palermo. Culturally Tailored Diabetes Education For Chinese Patients: A qualitative case study – *oral presentation at Australian Diabetes Society (ADS) and Australian Diabetes Educators Association (ADEA) Annual Scientific Meeting 2015 in Adelaide, Australia, 26-28 Aug 2015*
- **T Choi**, KZ Walker & C Palermo. Qualitative Perspectives Of Diabetes Management Behaviours Of Chinese Patients – *oral presentation at ADS ADEA Annual Scientific Meeting 2015 in Adelaide, Australia, 26-28 Aug 2015*
- **T Choi**, KZ Walker & C Palermo. Diabetes Education For Chinese Adults With Type 2 Diabetes: A systematic review and meta-analysis of the effect on glycemic control – *poster presentation at ADS ADEA Annual Scientific Meeting 2015 in Adelaide, Australia, 26-28 Aug 2015*
- **T Choi**, KZ Walker & C Palermo. Qualitative Perspectives Of Diabetes Management Behaviours Of Chinese Patients – *oral presentation at the Monash Chinese Research Studies Forum, Monash University, Clayton, Melbourne, Australia, 13 Aug 2015*
- **T Choi**, KZ Walker & C Palermo. Diabetes Education For Chinese Patients – *oral presentation at the Department of Nutrition and Dietetics, Monash University, Clayton, Melbourne, Australia, 9 Jul 2015*
- **T Choi**, KZ Walker, C Browning, C Palermo. Innovation In The Design Of Diabetes Education For Chinese Patients – *poster presentation at the 6th Asian Congress of Dietetics, Taipei, Taiwan, 21-24 Aug 2014*
- **T Choi**, KZ Walker, RA Ralston, C Browning, C Palermo. Australian Diabetes Education In The Eyes Of Ageing Chinese Migrants: A qualitative research study – *oral presentation at the 2<sup>nd</sup> International Conference on Ageing in a Foreign Land, Adelaide, Australia, 27-30 Jun 2013*
- **T Choi**, C Palermo, KZ Walker, RA Ralston. Seeing Diabetes Through The Chinese Cultural Lens: A qualitative research study – *oral presentation at the 16<sup>th</sup> International Congress of Dietetics, Sydney, Australia, 5 – 8 Sep 2012*
- **T Choi**, KZ Walker, RA Ralston, C Palermo. How Can You Make A Questionnaire More Appropriate For Chinese People? A qualitative research study – *poster presentation at the 16<sup>th</sup> International Congress of Dietetics, Sydney, Australia, 5 – 8 Sep 2012*

#### *Invited presentations*

- **T Choi.** Chinese People Are Not Difficult... Just Different – *oral presentation at Carrington Health, Box Hill, Victoria, 07 Feb 2017*
- **T Choi.** Cultural Perspectives Of Patient Education: A Case Study Of Chinese In Diabetes Education – *oral presentation and discussion at the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Adelaide, 21 Nov 2016*
- **T Choi.** Cultural Perspectives Of Patient Education: A case study of Chinese in diabetes education – *oral presentation and discussion at the University of Melbourne, Melbourne, Australia, 15 Sep 2016*
- **T Choi.** Diabetes Management And Chinese Groups – *oral presentation and panel discussion at the DAA Diabetes and Heart Health Update, Melbourne Convention and Exhibition Centre, Melbourne, Australia, 11 Mar 2016*
- **T Choi, KZ Walker & C Palermo.** Culturally Tailored Diabetes Education For Chinese Patients: A qualitative case study – *oral presentation at a DAA Diabetes Special Interest Group (Diabetes) in Melbourne, Australia, 19 Oct 2015*
- **T Choi.** Meeting Cultural Expectations In Practice: Seeing The World Through A Chinese Cultural Lens – *oral presentation given at a DAA Special Interest Group (Rehabilitation and Aged Care), in Melbourne, Australia 3 Aug 2012*
- **T Choi.** Meeting Cultural Expectations In Practice: Seeing The World Through A Chinese Cultural Lens – *oral presentation given at a DAA Special Interest Group (Public Health and Community Health) in Melbourne, Australia, 31 Aug 2012*

#### *Other research-related output during this candidature*

- **T Choi & A Kwok.** An Asian Mentoring Support Group: A strategy for acculturation in dietetic workforce – *poster presentation at the 33rd DAA National Conference, Melbourne, Australia, 19-21 May 2016*
- **T Choi.** Chinese Life! Program Evaluation Report. – *report submitted for Carrington Health, Melbourne, Australia, 31 Mar 2016*
- **T Choi, KZ Walker, RA Ralston & C Palermo.** (2015) Diabetes Education Needs of Chinese Australians: A qualitative study. *Health Education Journal*, 74(2), 197-208.
- **L Ryan & T Choi** (2015) Development of Culturally Appropriate Low GI Breakfast Meals for Asian Populations. *Proceedings of the Nutrition Society*, 74(OCE4), E224.
- **T Choi.** Diabetes Access Project as part of Improving the Diabetes Journey – *report submitted to Carrington Health, Melbourne, Australia, 30 Jun 2015*
- **T Choi.** Evaluation Report On The Chinese Diabetes 123 Program, *submitted to Manningham Community Health Services Limited, Melbourne, Australia, 31 May 2012*

## General declaration

### **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 five original papers (four published and one accepted) in peer reviewed journals and one submitted publication. The core theme of the thesis is *Promoting lifestyle changes for Chinese Australians with Type 2 diabetes*. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the Department of Nutrition, Dietetics and Food under the supervision of Assoc Prof Claire Palermo and Assoc Prof Karen Z Walker.

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

In the case of *Chapters 3 and 4* and in work appearing in the *Appendix* my contribution involved the following:

Thesis Chapter	Publication Title	Status	Nature and % of student contribution	Co-author name(s) Nature and % of Co-author's contribution*
3	Diabetes education for Chinese adults with type 2 diabetes: A systematic review and meta-analysis of the effect on glycemic control	Published in <i>Diabetes Research and Clinical Practice</i>	Paper identification, data extraction, data analysis, input into manuscript 60%	1) Zoe E. Davidson: data analysis, input into manuscript 5% 2) Karen Z Walker: data extraction, data analysis, input into manuscript 15% 3) Jia Hwa Lee: paper identification 5% 4) Claire Palermo: data extraction, data analysis, input into manuscript 15%
4	Optimising the effectiveness of diabetes education in an East Asian population	Accepted by <i>Nutrition &amp; Dietetics</i>	Study design, data collection, data analysis, input into manuscript 70%	1) Karen Z Walker: study design, input into manuscript 10% 2) Cate B Lombard: input into manuscript 5% 3) Claire Palermo: study design, data analysis, input into manuscript 15%
4	Culturally Tailored Diabetes Education for Chinese Patients: A Qualitative Case Study	Published in <i>Journal of Transcultural Nursing</i>	Study design, data collection, data analysis, input into manuscript 75%	1) Karen Z Walker: study design, input into manuscript 10% 2) Claire Palermo: study design, data analysis, input into manuscript 15%
4	Diabetes management in a foreign land: A case study on Chinese Australians	Submitted to <i>Health &amp; Social Care in the Community</i>	Study design, data collection, data analysis, input into manuscript 75%	1) Karen Z Walker: study design, input into manuscript 10% 2) Claire Palermo: study design, data analysis, input into manuscript 15%
Appendix	My Research Story: From an International Student to Optimizing Diabetes Education for My Fellow Chinese Immigrants	Published in <i>Sage Research Methods Cases</i>	Input into manuscript 100%	No co-author
Appendix	Reconsidering translating diabetes education – An East-Asian case study	Published in <i>Australian Diabetes Educator</i>	Input into manuscript 100%	No co-author

\*No co-author is Monash University student.

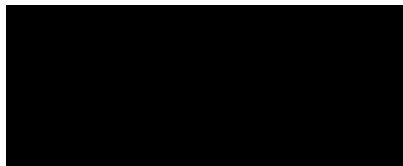
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The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-authors' contributions to this work. In instances where I am not the responsible author I have consulted with the responsible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

**Main Supervisor signature:**

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**Date:** 21/03/2017

## Acknowledgements in English

This thesis would not have been possible without the inspiration and support of a number of amazing people. First and foremost, I owe my deepest gratitude to my two wonderful supervisors, **Assoc Prof Claire Palermo** and **Assoc Prof Karen Z Walker**. I cannot be more thankful for having supervisors like Claire and Karen. At different stages of my PhD I was warned that most candidates, from time to time, get into difficult situations with their supervisors but this never happened to me. Instead, their enthusiasm, encouragement and ongoing support enriched my experience in getting-started as a researcher. I am especially appreciative to Claire for her promptness in reviewing my work and readiness to answer my questions despite her busy schedule. I was thankful for her care and support when I came back from my data-collection trips feeling sick and tired. Her academic guidance helped me to explore the qualitative research world and find my voice in it. I would like to express my gratitude to Karen for making herself available even when she was living overseas and tirelessly helping me to improve my writing skills. During the phase of multiple journal paper rejections, Karen's wise words, *"Don't worry, your papers will find their homes,"* were what kept me going! Above all, I also want to thank both of my supervisors for accommodating my *Chinese-ness* throughout this PhD journey: from speaking slower (Claire!) to being very patient when I expressed my entangled thoughts on the association between my data and Confucian values. I sincerely thank you for all you have done for me.

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## Acknowledgements in Chinese 致謝詞

在我博士學業進入尾聲之際，我除了要感謝兩位導師對我多年來的悉心栽培，我更要感激父母親對我的支持與鼓勵。在我博士求學的生涯裏，有高低起伏的經歷，也有甜酸苦辣的感受，好在有爹地媽咪無條件的支持和鼓勵，讓我一一跨過。

回想在我研究歷程的起初，我面對着研究資金不足的難題，一直苦惱無法到外地考察採集數據，是爹地二話不說答應做我經濟後盾，消除了困擾住我已久的擔憂。而媽咪給我的是行動上的支持，她怕我一個人在外地不安全，親身陪伴我到世界各地，一起採集數據。我在一年內跑了三個國家，媽咪都是隨時候命，從沒怨言，一次又一次陪着我出發。記得爲了到廣州醫院收集數據，媽咪就陪我乘搭四個小時火車，長途跋涉，舟車勞動走了十幾次。另外，在這項研究裏，爹地還利用了自己生意上的關係，幫我聯絡上廣州醫院做考察，又替我拉關係進行研究訪問；媽咪就幫我修改我所有的中文研究文件，包括改錯字和修正文法，幫助我在中文上的不足。在文獻多次被拒絕再修改後終於被接納時，爹地媽咪比我還要興奮高興。我知道自小父母對我都是呵護備至，雖然今日我早已成年，他們同樣都想盡辦法為我排除障礙，解決問題。所以如果說這個博士研究是我努力埋頭苦幹下完成，不如說是爹地媽咪無條件的付出、支持與鼓勵，令我在博士學業崎嶇路途上走得平坦，使研究順利展開至完成。

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## Abbreviations

AADE	American Association of Diabetes Educators
ADEA	Australian Diabetes Educators Association
ADMA	Australian Disease Management Association
ADS	Australian Diabetes Society
BMI	Body mass index
CALD	Culturally and linguistically diverse
CCM	Chronic Care Model
CNKI	Chinese National Knowledge Infrastructure
DAA	Dietitians Association of Australia
DSME	Diabetes self-management education
EPC	Enhanced Primary Care
FN	Field notes
GP	General Practitioner
HbA <sub>1c</sub>	Glycated haemoglobin
HP	Health professional
PICOS	Participant, intervention, comparator, outcome and study design
PWD	People with diabetes
SMS	Short message system
TCM	Traditional Chinese Medicine
UK	United Kingdom
UKPDS	United Kingdom Prospective Diabetes Study
WMD	Weighted mean difference

## Researchers mentioned in this thesis

CP	Claire Palermo, main supervisor
CL	Catherine Lombard, co-author of a manuscript
JHL	Jia Hwa Lee, bilingual researcher who verified translation
KZW	Karen Z Walker, associate supervisor
TC	Tammie ST Choi, author of this thesis & PhD candidate
ZD	Zoe Davidson, co-author of a manuscript



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# CHAPTER ONE: INTRODUCTION

欲窮千里目，更上一層樓。

Climb higher to look further.

## Type 2 diabetes and diabetes self-management education

Type 2 diabetes is a serious, progressive condition that is a leading cause of illness, disability and premature death in Australia, accounting for both a high healthcare expenditure and a loss to healthy years for people affected (Australian Institute of Health and Welfare, 2014). The short-term impact of type 2 diabetes includes hyperglycaemic symptoms (including increased thirst, headaches, fatigue, weight loss, frequent urination, blurred vision and difficulty in concentrating); and in the long-term, if poorly managed, it contributes to serious health complications including limb amputation, loss of sight and renal failure (Massi-Benedetti, 2002). Additionally, 75% of people with type 2 diabetes will die from cardiovascular disease (Tapp & Zimmet, 2003). Traditional treatment of diabetes has centred on pharmacological interventions. These are effective in optimising glycaemia and managing cardiovascular disease risk factors, thus reducing associated complications over time (Norris et al., 2002b). However, long-term follow-up studies indicate that despite early successes of these drug treatments, glycemic control may progressively worsen with time (UK Prospective Diabetes Study (UKPDS) Group, 1998). Studies have shown that many patients do not collect all medication needed from pharmacies (Donnan, MacDonald & Morris, 2002) or completely follow dietary recommendations (Toobert, Hampson & Glasgow, 2000), raising issues around treatment compliance and patients' responsibility for self-management.

In recent years, the focus of diabetes management has shifted towards education programs designed to empower patients to manage their condition. These programs have gained support among health professionals who have developed educational strategies to empower patients and support them in acquiring the necessary skills for taking active responsibility in their day-to-day lifestyle practices necessary for maintaining optimal glycemia (Rutten, 2005; Department of Health, 2002). In diabetes self-management education (DSME), health professionals translate scientific knowledge of diabetes and its management into practical advice to facilitate self-care (Funnell et al., 2009). The AADE7 Self-Care Behaviours™ framework defined by the American Association of Diabetes Educators (AADE) provides a framework to guide the design of successful and effective DSME. It has been suggested that DSME should focus on seven main self-care behaviours: healthy eating, being active, monitoring, taking medications, problem solving, healthy coping and reducing risks (American Association of Diabetes Educators, 2014). This framework allows health professionals the flexibility to individualise education for different patients, while promoting an outcomes-driven practice and a shift of focus to person-centred goals (Burke, Sherr & Lipman, 2014; Hass et al., 2012). Structured DSME aims to improve clinical outcomes in the short term, and in the long term, to engender better health status and quality of life (American Association of Diabetes Educators, 2003).

### Role of dietitian in promoting diabetes self-management

Dietitians are an integral part of the diabetes education team (Funnell et al., 2009). 'Healthy eating' is one of the key self-care behaviours in the AADE7 framework and recommendations on appropriate dietary patterns have been recognised as a cornerstone of treatment for type 2 diabetes (Mann et al., 2004). Dietary intervention studies have indicated that patients who receive input from dietitians have significantly improved glycemic control, body composition and risk factors for diabetic complications (Coppell et al., 2010; Andrews et al., 2011).

Over the years, the role of dietitians in the diabetes healthcare team, particularly in primary care, has gradually been evolving. While the primary role of dietitians is to provide expertise in medical nutrition therapy for patients, in the last decade, this role has expanded to include counselling, offering behaviour modification support and sometimes also cognitive behavioural therapy (Waldron & McGough, 2000). This extension of professional duties supports a holistic and individualised approach towards diabetes management rather than a one-size-fits-all approach.

Person-centred care promotes individualising care for patients, respecting their needs, preferences, values and rights, and developing effective therapeutic relationships (Leplege, Gzil, Cammelli, Lefevre, Pachoud & Ville, 2007). Person-centred care includes four main elements including: being responsive to a patient's physical and psychological needs; enabling discussion of the patient's concerns; establishing a sense of partnership; and actively involving the patient in decision-making (Bensing, 2000; Mead, Bower & Hann, 2002). As applied in diabetes care, person-centred care promotes mutual respect, trust and shared decision making between the patient and the health professional, shifting the focus towards a patient empowerment model for self-care. Evidence suggests that in European populations, person-centred diabetes education programs are more effective in changing behaviours and ensuring compliance when compared with didactic educational approaches (Deakin, Cade, Williams & Greenwood, 2006). Since the person-centred approach was developed in the 1940s, it has been adopted across many health disciplines, including dietetics (MacLellan & Berenbaum, 2007). In Australia, the person-centred approach is considered to be a core area of dietetic practice (Dietitians Association of Australia, 2015), aiding dietitians to adopt a non-directive, facilitative approach to help patients to explore issues impeding better health, present them with expert nutrition information and support them in changing dietary behaviours.

### Diabetes education for non-English-speaking Australians

The person-centred approach in DSME has been widely tested in individual and group settings and intervention results have contributed to the development of best practice guidelines. However, almost all intervention studies used in the development of best practice guidelines have focused on

English-speaking Caucasian patients with type 2 diabetes (Hawthorne, Robles, Cannings-John & Edwards, 2010). When providing diabetes care and education to a culturally and linguistically diverse (CALD) population, it is recommended that this Western evidence-based person-centred approach should also be followed after language-translation. This is supported by a recent review highlighting that the most common interventions employed when care was provided to CALD communities in Australia included those that employed bilingual health workers or interpreter services (Henderson, Kendall & See, 2011). These strategies focus only on addressing the language difference of the CALD communities and overlook the underlying cultural needs of these ethnic communities. One Australian study demonstrated that a language-translated, person-centred, participatory diabetes education approach was not appreciated by Chinese patients. Not only did it fail to match patient expectations, it also contributed to additional stress, frustration and even anger (Choi, Walker, Ralston & Palermo, 2015).

### [A personal experience of being caught between two cultures](#)

As an Australian-trained Chinese bicultural trilingual dietitian, I conveniently found my first clinical job as a community dietitian in Glen Waverley, in the heart of a Chinese-migrant-populated suburb in Melbourne. Born in Hong Kong, bred in Singapore and trained in Australia (at Monash University) made me, arguably, a unique dietitian, someone with *'my feet in both worlds'*. I started my career as a dietitian, in part, to extend a helping hand to patients from my own ethnic group. The fact that most of my Chinese patients, just like myself, are foreign-born and share a common culture creates an immediate bond between us. On many occasions when I greeted my patients in Cantonese or Mandarin at the clinic reception, I could tell from the smile on their faces that there was a feeling of mutual warmth due to our shared culture. In my role in the clinic, I not only provided community dietetic services in my native languages, I also helped to build a bridge between Caucasian clinicians and their Chinese patients. This ranged from providing simple translation of conversations to explaining cultural norms and behaviours for both parties. Having my feet in both worlds, I considered myself fortunate to be able to utilise my cultural knowledge in my professional work and enhance clinical practice but, more importantly, I could assist my fellow Chinese community members in living in this foreign land. Being a first-generation Australian after growing up in Hong Kong and Singapore, I could relate to my own experience when my patients reporting a feeling of 背井離鄉 (being away from home) and 舉目無親 (finding no relative to turn to), and felt compelled to work towards supporting Chinese-born Australians achieve better health.

In my work I gradually became aware that providing a good cross-cultural health service was not simply a matter of translating health messages into the appropriate language. During dietetic consultations undertaken in Chinese, I often found my patients behaved differently. I consistently

perceived a sense of discomfort when I collected a diet history or facilitated a goal-setting activity. My Chinese patients were often quite reluctant to participate. Initially, I thought it was because I lacked the skills needed or expected from a Chinese professional (since all my education has been in English since I was aged 12) but deep down I knew it was more than a language problem. The more training I did on 'best practice' in nutrition counselling, e.g., taking a person-centred approach and goal-directed care planning, the more I realised that these theoretical approaches did not align well with my Chinese culture. Culturally, we Chinese value collective compliance to instructions from authority figures above individual autonomy (Huang and Charter, 1996), and we prefer to communicate by 'reading between the lines' rather than having an open discussion (Gao, 1998) including open discussion of care-plans. It was then I heard a tiny voice in my head, challenging me to think *what if behaviourist and education theories don't translate well to the Chinese? What if language-translated health services are not meeting Chinese cultural needs? If the translated dietetic service we have been delivering is suboptimal, have clinicians been providing a disservice to the Chinese population all these years?* My determination to enhance quality of dietetic service to my fellow Chinese and my curiosity to explore 'the alternative approach' got me started on my research journey.

My research study was an exploratory one using qualitative methodology (details of which are outlined in Chapter Four). I acknowledge my role as the researcher as being in itself a research tool, contributing both positively and negatively to the study as described below. On the positive side, I have brought into this study not only my linguistic skills that allowed collection of data to take place in a naturalistic way, but also my cultural understanding of Chinese people which has greatly assisted various research phases, including gaining entry to data collection field-sites, reducing translation errors during participant-observations, and drawing upon my personal and professional experiences during data analysis. At various data collection field-sites across China, Hong Kong and Singapore, I brought with me both some Australian souvenirs and certificates of appreciation signed by my Head of Department. I knew culturally, before setting off on my trips, these gifts would be keys to opening doors to my research informants, and this was proven to be the case. Some overseas clinicians began generously sharing experiences with me upon receiving my presents or after taking a photo with me on my presentation of the certificate-of-appreciation. Also, I was connected with the diabetes clinicians in Guangzhou, China via my father who linked me up to a business partner with connections to various hospitals. The system of social network in China had made entry very challenging, and if the clinicians had not '*given face*' to my father's business partner who '*gave face*' to my father, I would not have been able to collect any research data in China. On the other hand, on the negative side, although my cultural understanding has been an advantage to conducting this research study, I must say sometimes the '*Chinese-ness*' in me created some challenges in this research journey. While I am



multilingual, my speaking and writing skills for both English and Chinese were not highly proficient. This PhD journey has allowed me to sharpen my English writing and presentation skills. I developed from seeking basic writing assistance from my supervisors to confidently presenting my work at international conferences. My mother, who cross-checked my Chinese research documents before they were sent out, also became my cultural knowledge reference throughout my research journey. She provided insights to initiate conversations with the Chinese research informants, corrected me on the use of culturally appropriate language and approaches, and suggested strategies to maintain relationships with participating clinicians. This was necessary as 'great relationships' (關係) are very important in the Chinese culture. Furthermore, at the beginning of this PhD journey, I realised I behave very much like a Chinese learner (whose learning orientation is explored in this thesis), accepting unquestioningly advice and instructions from supervisors and examiners. I struggled to develop a research voice of my own and found that I tended to humbly understate my work which was interpreted as a lack of confidence. I was influenced and shaped by the years of exposure to didactic education in a Chinese classroom where teaching was described as 'duck-feeding / force-feeding' (填鴨) the students, or in other words, the teacher presented dry facts and principles to students with little checking on understanding or assistance on application (Chen, 2016). In such a learning environment, I had little chance to think abstractly or voice my criticism. I was brought up in a culture where criticism unsettles harmony and is considered impolite. I was socialised to conform and not to criticise, and it did not help in the research environment where critical appraisal of literature was the core of research.

On the flip side, this contrasting learning experience has allowed me to gain in-depth understanding of how diabetes education, based on the Western models promoting abstract conceptual thinking and learning, was so inappropriate for the Chinese patients. Furthermore, while my Chinese cultural knowledge has positively contributed to data collection, I found myself overlooking some cultural information during analysis. We adopted investigator triangulation (more details on my research position presented in Chapter 4), where my supervisor of non-Chinese background and I coded the data independently then compared and discussed the analysis. The process not only enhanced the rigour of the study but also indicated to me some Chinese cultural norms and practices which I had overlooked, building my cultural appreciation. Finally, I am not going to hide the fact that writing this positioning statement has been difficult. In Chinese culture, we hate to be centre of attention and would never put ourselves in the spotlight, let alone explicitly describe our emotions and thoughts. This research journey has definitely caught me between the two cultures and in turn, transformed me in many ways.

My research story commenced with an emotional obligation to improve the quality of dietetic service targeted at my fellow Chinese Australians, and it has then challenged me at various stages of the research both intellectually and culturally on my beliefs and behaviours, and as a result, has equipped me with research skills and deep cultural understanding. While this journey has transformed me in many ways, the Chinese-ness in me has become part of my professional identity. I am sure I will continue to embrace my culture and employ my cultural understanding in enhancing dietetic service for my Chinese patients and the wider population.

See the Appendix for a longer description of my PhD journey which has been published in *Sage Research Methods Cases*.

### Research aims and objectives

This research aims to examine the most effective methods used to bring diabetes education to Chinese patients, to explore behavioural patterns displayed by Chinese patients during diabetes education and identify the most successful education approaches. More specifically, this exploratory study had the following objectives:

- To explore Chinese patients' learning behaviours and preferences in diabetes education; and
- To identify the best health education delivery approach and cultural tailoring strategies; and
- To provide recommendations on designing a Chinese diabetes education service, and to propose a diabetes education framework that effectively promotes lifestyle modification, namely healthy eating and regular physical activity, in Chinese Australians.

The study comprises two main parts:

#### *Part 1: Systematic review and meta-analysis*

This study aimed to systematically review the available evidence in both English- and Chinese-language publications to quantitatively measure the glycemic effect of various diabetes education approaches for Chinese patients. Specifically, this review sought specific clinical recommendations on the best educational approaches for effective glycemic improvements for Chinese diabetes patients. This study was designed to answer the following research question:

- What is the most clinically-effective diabetes education approach for Chinese patients with type 2 diabetes, to reduce glycated haemoglobin?

#### *Part 2: Qualitative case study research*

The objective of this qualitative study was to explore philosophies and behaviours of Chinese patients across three countries (China, Singapore and Australia) and identify unique cultural

tailoring strategies that appear most successful in the diabetes education of Chinese patients. This study was designed to answer the following research questions:

- How do Chinese patients and facilitating clinicians behave during diabetes education sessions?
- How can diabetes education be culturally tailored to meet the unique needs and expectations of Chinese patients?
- How does experience, including migration, impact on the diabetes journey experienced by Chinese Australian patients?

### Thesis overview and structure

This thesis describes research designed to identify effective and commonly-adopted education approaches in diabetes education targeted at the Chinese, and to explore, in clinical settings, cultural-orientation patterns of learning and behavioural change exhibited by Chinese people with type 2 diabetes. This chapter has begun with an introduction to self-management for type 2 diabetes. It describes the role of a dietitian in facilitating self-management education, and how the dietitian-researcher identified a research problem in her clinical practice and began her research journey.

Chapter 2 provides an overview of the Chinese Australian community and the extent of diabetes in this ethnic population. It follows with a discussion of common theories underpinning diabetes education and practices for culturally tailoring health education.

Chapter 3 includes a systematic review and meta-analysis (in the form of a published paper, with supplementary materials) on effective diabetes education approaches for Chinese patients with type 2 diabetes. This review was conducted by synthesising results from both English- and Chinese-language publications on Chinese diabetes education over the past ten years, seeking clinical recommendations on the best education approaches for effective glycemic improvement for Chinese patients with type 2 diabetes.

Chapter 4 describes a qualitative case study. It outlines the methodological framework underpinning the qualitative research, including an overview of the strategies of inquiry, the various data collection and analysis techniques used and the strategies put in place to enhance research rigour. It also contains study results, including a section describing the cases, two papers (one published and one accepted for publication) and a further paper submitted for consideration. Finally it ends with a conclusion based on this qualitative research.

Chapter 5 then draws together results from the systematic review and meta-analysis and the findings from the qualitative case studies, to provide a conceptualisation of findings and suggest a new paradigm of diabetes care and education for Chinese patients.

Chapter 6 is the final chapter of the thesis and provides an overview of the potential way forward. It includes implementation strategies of a model of diabetes care for the Chinese Australian patients, with details on a suggested systemic coordination approach across settings.

## CHAPTER TWO: LITERATURE REVIEW

性相近，習相遠

People are born the same, but culture makes them different.

## Preamble

This chapter provides an overview of my population of interest: the Chinese Australian community and the prevalence of diabetes in this population. This is followed by an overview of common theories underpinning chronic illness care and diabetes self-management education including a review of current practices for culturally tailored health education.

## The Australian Chinese community

Before the discovery of gold in Victoria, Australia in the 1850s, there were very few Chinese lived in Australia. A large scale Chinese migration was then prompted by gold mining. By 1891, census data showed that 35,665 Chinese were then living in Australia, of whom only 1% were female (Wang, 1988). After the Federation of Australia in 1901 and the passing of the Immigration Restriction Act, Chinese were unable to enter Australia. From the 1960s, progressive change in attitudes resulted in the dismantling of the White Australia Policy and the growth of multiculturalism (Ngan & Chan, 2012). Between the 1970s and 1990, Chinese people came to settle in Australia from Malaysia, Vietnam, Taiwan, Hong Kong and China (Mak & Chan, 1995). Today, the Australian Chinese population makes up 4.3 per-cent of the total population with 866,200 Chinese Australians recorded in 2011 (Australian Bureau of Statistics, 2011a). Furthermore, 35 per-cent of these are recent arrivals (Australian Bureau of Statistics, 2011a), indicating a continuous influx of Chinese migrants to Australia. In particular, the number of Chinese migrants living in Melbourne has expanded considerably, more than doubling between 2001 and 2011 (Australian Bureau of Statistics, 2011b).

Despite sharing a common culture, the Chinese migrant community on Melbourne is far from being a homogenous group (Gervais & Jovchelovitch, 1998; Chan, 1999). Chinese in this city come from many countries, including China, Hong Kong, Singapore, Malaysia, Vietnam, Cambodia, Indonesia and other countries (Migrant Information Centre (Eastern Melbourne), 2010). Of those living in Melbourne with Chinese ancestry, approximately 25% are second or third generation, i.e. they are Australian-born Chinese or they were born to Australian-born Chinese parents (Ngan & Chan, 2012). The subethnic Chinese groups exhibit a diversity of religious, political and social ideologies and different levels of urbanisation, Westernisation and acculturation to the Australian lifestyle. Most Chinese people congregate with people from their own home countries, or with other people who share the same language. Mandarin and Cantonese are the two main Chinese languages found in Australia, although there are many other spoken dialects such as Teochew, Hokkien, Hakka and Shanghainese (Migrant Information Centre (Eastern Melbourne), 2010). Cantonese-speakers are historically the largest Chinese population in Australia and the most adapted and familiar with Australian life. They usually prefer reading traditional Chinese characters (Fenton, 2014). Mandarin-speakers read simplified Chinese characters and have been reported to retain more of their traditional Chinese culture (Yu &

Berryman, 1996). The number of Mandarin-speaking Chinese migrants in Australia has overtaken Cantonese-speakers from around 2013 onwards (Fenton, 2014).

'Being Chinese' often entails sharing of a collectivistic-orientated culture shaped largely by Confucianism. In this culture, individuals are encouraged to place emphasis on: (i) the views, needs and goals of the group over their own self-interest, (ii) social norms and duty as defined by the group, (iii) great readiness to cooperate with others, and (iv) emotional attachment to the group (Wheeler, Reis & Bond, 1989). Confucianism, the ancient philosophy with its two-and-a-half-thousand year history, has formed the foundation of Chinese social structure, moral values and individual's obligations through many dynasties (Huang & Charter, 1996). In particular, Chinese people constantly evaluate their position in multiple layers of relationship with others, supported by cultural values such as filial piety (i.e. obedience to parents), dignity, loyalty and integrity (Gao, 1998). Being aware of their relations with others is seen as a lifetime goal for the Chinese. Today in Chinese society, each individual continues to feel very much a part of their particular community and their behaviours then can be largely shaped by their fixed role in this collective and their complex multi-layer relations with the various members within it (Cheng, 1990). Furthermore, Taoism which is also an important Chinese philosophy, emphasises the importance of adjusting to and tuning in to the psychosocial environment (Yip, 2004). Taoism stresses 無爲 (doing nothing) and avoid-taking any inappropriate actions that might disrupt the harmony of the psychosocial environment (Yip, 2004). Finally, the third influential Chinese philosophy is Buddhism. It focuses on self-control of emotions, desires and self-doubt by living in the present moment (Yip, 2004). These cultural norms and values impact on health-related behaviours, including building therapeutic relationships with health professionals during consultations, obtaining and learning health information and managing healthy lifestyle habits.

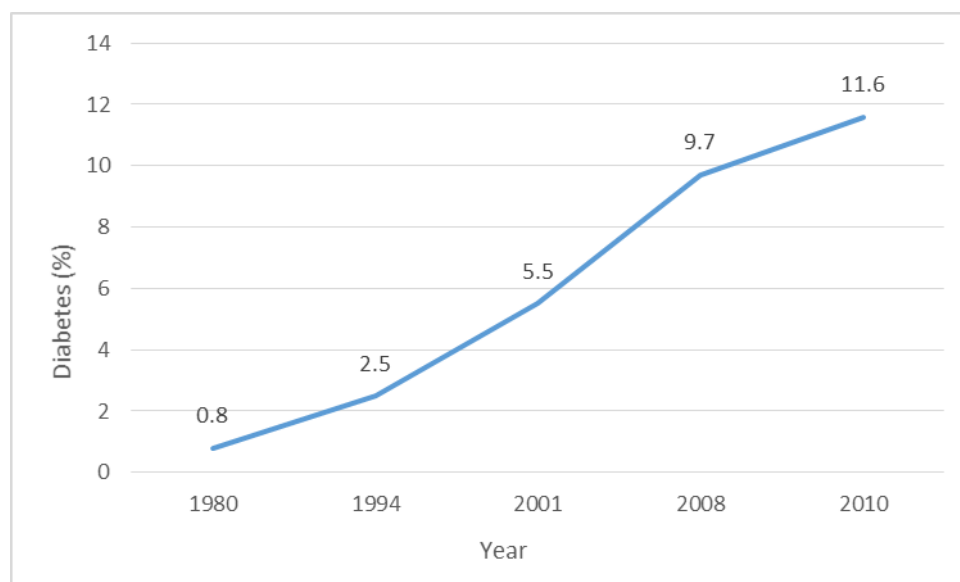
Acculturation refers to the change of values and behaviours that can occur as a result of continuous direct contact with another culture (Redfield, Linton & Herskovits, 1936). Although acculturation is inevitably experienced by all migrants of any race settling into a new country, the outcomes vary. Previous studies have found that almost three in four Chinese migrants living in Canada reported a low level of integration among the migrants themselves (Goldmann, 1998) although assimilation usually occurs among the second and following generations (Rumbaut, 1994). This assimilation is rarely complete. Chinese who are born and grow up in Western countries often retain much of their cultural heritage and practice (Rosenthal & Feldman, 1992). Traditional Chinese culture appears to be deeply rooted in the Chinese people's personality and way of life (Mah, 1995). This culture however, does vary, with differences between Han Chinese and other Chinese ethnic groups; between migrants from northern versus southern China; between Chinese who have migrated to Australia from different

countries of South East Asia; and between migrants who have been in Australia for many years versus new arrivals.

### Type 2 diabetes in the Chinese community

Currently 8.3% of the world's adult population have type 2 diabetes, and it has been projected that the affected population size will exceed 592 million within the next 25 years (Guariguata, Whiting, Hambleton, Beagley, Linnenkamp & Shaw, 2014). While Asia is the epicentre of the diabetes epidemic (Sicree, Shaw & Zimmet, 2003), China as the world's most populous country has the largest and most rapidly growing population with diabetes (Yang et al., 2010). In just 30 years, the rate of increase diabetes prevalence has jumped from 0.9% in 1980 (National Diabetes Prevention and Control Cooperative Group, 1981) to 11.6% in 2010 (Xu et al., 2013) (Figure 1).

Figure 1: Change in the prevalence of diabetes in China from 1980 to 2010 (National Diabetes Prevention and Control Cooperative Group, 1981; Pan, Yang, Li & Liu, 1997; Gu et al., 2003; Yang et al., 2010; Xu et al., 2013)



Previous epidemiological studies have indicated a diabetes prevalence as high as 81% in Chinese people over the age of 60 years, and have also highlighted the very worrying fact that diabetes now also affects a high proportion of young people (Xu et al., 2013). In some westernised Chinese cities, type 2 diabetes has overtaken type 1 diabetes as the predominant form of diabetes in children (Ma & Chan, 2013). These data suggest diabetes is metaphorically a 'healthcare time bomb' in the Chinese population, posing a foreseeable high healthcare cost and threatening to endanger years of healthy life, and thus productivity, for Chinese. Outside China, the problem is also widespread. The prevalence



of diabetes among Chinese people living in economically well-developed regions (Xu et al., 2013) and in various western countries around the world (Gu et al., 2005) is also very high.

It has been argued that the diabetes epidemic in China is associated with the development of obesity secondary to a shift away from traditional lifestyle behaviours following rapid economic development. In particular, evidence indicates that diabetes affects the Chinese at a lower body mass index (BMI): Chinese people with newly diagnosed diabetes were found to have an average BMI of 23 kg/m<sup>2</sup> compared with over 27 kg/m<sup>2</sup> in most Caucasian studies (Nettleton, Lutsey, Wang, Lima, Michos & Jacobs, 2009). This may be due to the tendency for Chinese to more readily develop visceral adiposity and an associated higher degree of insulin resistance (Park, Allison, Heymsfield & Gallagher, 2001). Furthermore, progression of diabetes can occur at a faster rate in Chinese than in Caucasian populations, possibly secondary to more pronounced beta-cell dysfunction in early insulin secretion (Torréns et al., 2004). A meta-analysis has found that East Asians, including Chinese, have higher insulin sensitivity and a much lower insulin response compared to Caucasian and African people, suggesting that, in these groups, even a low level of beta-cell dysfunction may precipitate progression of type 2 diabetes (Kodama, Tojjar, Yamada, Toda, Patel & Butte, 2013). These genetic predispositions, in the environmental setting of a sedentary lifestyle, and with a higher-fat diet that may suppress expression of genes for glucose transporter 2 and glucokinase – critical factors for glucose metabolism – thus may contribute to the development and worsening of type 2 diabetes in the Chinese population (Cerf, 2006). These statistics suggest that the Australian healthcare system is likely to face increasing pressure in providing care for Chinese Australians with diabetes.

Additionally some historical social factors are believed to contribute to the diabetes epidemic. Chinese people who, as infants, experienced the Chinese Great Famine of the late 1950s to the early 1960s appear to be more prone to development of chronic disease in adulthood, including diabetes and obesity. It has been argued that genetic traits and phenotypes governing efficient energy storage and pathogen resistance provided survival advantages during the time of famine, but became counter-protective during the period of rapid socioeconomic changes and adoption of the new lifestyle of physical inactivity and over-nutrition (Chan, Zhang & Ning, 2014). For middle-age Chinese people, especially women, foetal exposure to famine contributes to higher risks of overweight (Luo, Mu & Zhang, 2006). The Great Famine in China was followed by the Cultural Revolution. Between 1966 and 1976 Chinese people experienced a time of further hardship when food was again scarce, coupled with the experience of hard physical labour and extreme psychological stress, further complicating the pathogenesis of type 2 diabetes (Li et al., 2010). During the Cultural Revolution, formal education in China was suspended for approximately six years, so that many Chinese of that era missed or had to delay their education (Meng & Gregory, 2002) whereas succeeding generations have enjoyed

moderate to high levels of education. This history accounts for a wide disparity in educational attainment within the Chinese population, which in turn impacts on community awareness and control of diabetes. Adding to this disparity, Chinese migrants who came to Australia from other countries in Southeast Asia, may or may not have experienced these events, depending on the timing of their family's migration from China. They may however, have been affected during foetal life or infancy by social disruptions and conflicts arising from decolonisation or local wars such as the Vietnam War.

Although the diabetes epidemic is becoming a significant problem for Chinese people, population-specific diabetes treatment guidelines and frameworks to guide self-management education are lacking. Current Chinese Guidelines for Type 2 Diabetes Care and Education (Chinese Diabetes Society, 2010) are largely based on Western evidence and approaches and evidence is lacking for the effectiveness of the Western behaviourist and educationist theories in supporting behaviour change in Chinese patients. Nevertheless, results from the well-known Da Qing Impaired Glucose Tolerance and Diabetes Study clearly demonstrate that early lifestyle change can greatly slow the progression from impaired glucose tolerance to type 2 diabetes (Li et al., 2008). This thesis will focus on exploring the strategies and approaches in diabetes education that effectively transfer self-care knowledge and promote healthy dietary and physical activity habits among Chinese populations for better control of glycemia.

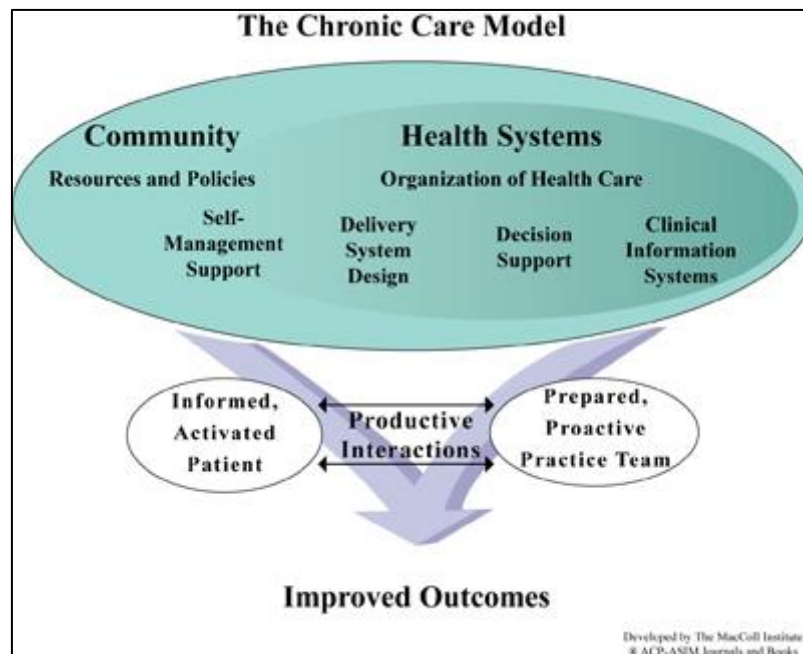
### Wagner's chronic care model and diabetes self-management education

Diabetes is a chronic disease where those affected have to manage and control their glycemia around the clock. One study in United Kingdom (UK) calculated that while patients are typically cared for by health professionals for approximately six hours a year, this leaves them 8,760 hours per year caring for themselves (Fisher et al., 2012). Self-care involves the adoption of healthy lifestyle habits and regular blood glucose monitoring. Self-care is characterised by a cycle of: *stability*, *exacerbation*, *recovery* then back to *stability* (Hwu, Coates & Boore, 2001). Therefore, the healthcare model for management of this chronic disease differs from the treatment of acute episodic illness. In dealing with chronic disease, health professionals must provide education and motivate lifestyle changes, while attempting to maximise the effectiveness of the small amount of time they have with patients to empower and support each patient.

The *Chronic Care Model* (CCM, Figure 2 and Table 1) developed by Wagner and colleagues in 1999 (Wagner, Davis, Schaefer, Von Korff, & Austin, 1999) is a well-known and widely-adopted model guiding improved chronic-illness care delivery. It promotes a shift of focus from dealing with acute episodic care to a systematic approach towards high quality chronic and proactive care that is

organised, structured and planned, through the collaboration of multidisciplinary teams and planned interactions with patients (Wagner, Austin, Davis, Hindmarsh, Schaefer, & Bonomi, 2001).

Figure 2: The Chronic Care Model (Wagner et al., 1999)



Note: Reproduced from Wagner et al., 1999

Table 1: Definition of elements of the Chronic Care Model

Elements	Definition
Health system organisation of healthcare	Plan healthcare program with measurable goals for better care of chronic illness
Self-management support	Emphasise a person-centred approach to help patients manage their own care
Decision support	Integrate evidence-based guidelines into daily clinical practice
Delivery system design	Focus on teamwork and expanded scope of practice for team members to support chronic care
Clinical information systems	Develop information systems based on patient populations to provide relevant client data
Community resources and policies	Develop partnerships with community organisations that support and meet patients' needs

The CCM provides a guide and principles for a coordinated, evidence-based, person-centred approach, with emphasis on six main elements (Table 1): health system organisation of healthcare, self-management support, decision support, delivery system design, clinical information systems, community resources and policies, to promote productive interactions between the health professional team and the patient (Bodenheimer, Wagner & Grumbach, 2002). It is often applied in a primary care setting and recognises that patients, regardless of the time of onset, aetiology and manifestations of their condition, experience a common set of challenges in dealing with their symptoms, disability, emotional impacts, medication regimes, difficulties in adopting lifestyle modifications, and obtaining helpful medical care (Wagner et al., 2001). The CCM provides a functional blueprint for the healthcare system to design services that meet the needs of patients, while promoting patients to be their own primary care manager and participate in making informed decisions (Wagner et al., 2001).

The CCM has been widely applied to the provision of care for diabetes (Davy, Bleasel, Liu, Tchan, Ponniah & Brown, 2015), with optimal clinical outcomes reported when multiple CCM elements were implemented systematically (Stellefson, 2013). In particular, the CCM coordinated diabetes care model promotes person-centred care with increased patient involvement and shared decision-making, establishing a clinical record system to prompt preventative actions to reduce diabetic complications and facilitating conversations between patients and health professionals, and importantly promoting integrated DSME to facilitate development of self-care skills (Dancer & Courtney, 2010). In Australia, the application of CCM into diabetes care services is not superficially obvious but it is certainly embedded in the healthcare system at both State and Federal levels. For example, the Enhanced Primary Care (EPC) package introduced in 1999 addressed the CCM element of *delivery system design* and encouraged health professionals to participate in structured multidisciplinary care-planning (Zwar, 2006). In another example, in Victoria, independent community health services funded by State and Federal Governments, provide universal access to primary care services for *self-management support*, to maximise people's health and wellbeing. Community health services provide a range of person-centred services, including delivering DSME, and utilising *clinical information systems*, e.g., electronic patient records, to allow monitoring, quality improvement and evaluation of services. From the Chinese perspectives, due to the lack of a comprehensive healthcare system in China, the CCM has been serving more of an ideal model for the sector to work towards as the Chinese practitioners have recognised it as a coordinated and supportive model for management of chronic diseases, including diabetes (Tian, Li & Zhang, 2016).

### Theories underpinning diabetes education

DSME is one of the core elements in the CCM for diabetes care and is also recognised as a critical component of care for all people with diabetes (Haas et al., 2013). There are several recognised standards guiding the delivery of DSME. The International Diabetes Federation published 'International Standards for Diabetes Education' in 2003. In the United States, the 'National Standards for Diabetes Self-Management Education and Support' has been updated biennially. In Australia, the 'National Evidence Based Guideline for Patient Education in Type 2 Diabetes' was published in 2009 and has been significant in guiding clinical practice. Although there is no one consistent most effective approach or strategy across all these guidelines and it is difficult to pin-point the 'active ingredient' in these frameworks, a person-centred approach has been emphasised, with an ultimate goal to facilitate sustainable healthy behaviours on an ongoing basis beyond self-management education.

DSME in Australia has been designed in accordance with the Australian National Evidence Based Guidelines for Patient Education in Type 2 Diabetes (Colagiuri et al., 2009) and the Information and Education for People with Diabetes: A 'Best Practice' Strategy report (Colagiuri & Goodall, 2009), which define quality diabetes education and assist health professionals in providing evidence-based education and self-management support. The guidelines are based on various education theories, including behaviourism, cognitive learning theory, constructivism and humanism. In line with the many theories (Table 2) explaining the different approaches to diabetes education, these reports highlight that the learner must be an active participant in a variety of learning experiences for optimal learning to occur.

Table 2: Theories underlying diabetes education (Colagiuri et al., 2009)

Education theory	Summary
Behaviourism	Operates on the principle of ‘stimulus-response’ and considers the learner as passive, with behaviour largely shaped by external reinforcement
Cognitive learning theory	Explains how a learner processes what is learned in the brain and tests new knowledge against their existing ideas, beliefs and experience
Constructivism	Considers how learners actively construct new ideas and theories by building onto existing experience emphasising learning that is realistic, relevant and meaningful for the individual
Humanism	Considers learning based on learner-centred objectives identified by the learner to allow them to discover ideas – focuses on empowerment and collaborative learning

In designing DSME sessions, the AADE7™ framework, discussed in Chapter One, provides a theoretical basis for the education-content covered, and these guidelines provide health professionals with a useful theoretical background to better support patients in the learning process based on CCM theory.

### Theories underpinning behaviour change promotion

Diabetes self-management education (DSME) requires more than just learning facts about diabetes and its management. DSME aims to promote and support positive self-management behaviours that can achieve optimal glycemic control and improve quality of life. The different health behaviour theories offer varied explanations on how patients may behave when presented with information from health professionals. More widely-used theories include the *theory of reasoned action* (Fishbein, 1967), the *protection motivation theory* (Beck & Frankel, 1981), the *self-regulation theory* (Leventhal & Cameron, 1987) and the *trans-theoretical model* (Prochaska & DiClemente, 1985). It is suggested that behaviours are driven by normative beliefs, perceived benefits and threats of intended actions and feelings of self-efficacy. These theories have informed much of the health education designed for people with type 2 diabetes. For example if health professionals follow the *protection motivation theory*, they may adopt scare-tactics when trying to motivate lifestyle change. Table 3 summarises how various healthy behaviour theories can be used as part of DSME by health professionals.

Table 3: Theories underlying behaviour change promotion and their application in DSME

Theories underlying health behaviour promotion	Summary	Application in DSME
Theory of reasoned action (Fishbein, 1967)	Actions are promoted by persuasion	Clinicians try to reason the pros and cons of lifestyle changes with patients
Protection motivation theory (Beck & Frankel, 1981)	People protect themselves based on the fear of a threat they perceive they have	Clinicians adopt scare tactics to motivate behaviour change
Self-regulation theory (Leventhal & Cameron, 1987)	Conscious monitoring of one's own thoughts, behaviours and feelings will help one to reach goals	Clinicians encourage patients to self-monitor blood glucose and dietary habits so that they can reach lifestyle modification goals
Trans-theoretical model (Prochaska & DiClemente, 1985)	Behaviour change happens in a step-wise process, from not ready, to ready, to preparation, then action, and termination	Clinicians assess patients readiness to change and support patients to gradually move to the next stage

These underlying theories, again, highlighted the importance of a person-centred care approach, directing health professionals to put the patient at the centre of DSME delivery and care-planning and to individualise diabetes care service to the patient's needs, thus enhancing the quality and effectiveness of DSME.

### Individual and group diabetes education models

Although supporting health behaviour change is an individualised psychological process, group-based DSME has been commonly employed since the 1970s (Mensing & Norris, 2003). Group education is not only more cost-effective and efficient than individual consultation (Mensing & Norris, 2003), it may also produce similar metabolic outcomes as DSME delivered individually (Rickheim, Weaver, Flader & Kendall, 2002). Traditionally, group-based DSME was delivered didactically in a lecture format; however, today, group education generally adopts a more interactive forum format where patients meet and discuss their experience with one another while the clinician facilitates the session and provides the scientific knowledge (Steinsbekk, Rygg, Lisulo, Rise & Fretheim, 2012). Such social support by other affected patients has been found significant in providing appraising, informative effects as well as emotional support (van Dam, van der Horst, Knoop, Ryckman, Crebolder & van den Borne, 2005), allowing patients to exchange practical coping strategies and deal with self-care stress. The disadvantage, or challenge, of group-education is the heterogeneous characteristics of group-education participants that makes tailoring to their individual needs more difficult (Mensing & Norris,

2003). Also the effectiveness of a group-based DSME may be dependent on many factors including: the theoretical model used, instructor skills, the rapport achieved between participants, plus logistic or external factors like the venue or the weather (Steinsbekk, Rygg, Lisulo, Rise & Fretheim, 2012). These multifactorial influences make it difficult to replicate the effects or monitor the quality of group-education.

### Culturally tailoring practices of diabetes education

When delivering DSME for ethnic minority patients, like the Chinese, current practice relies heavily on Western evidence-based educational materials and theoretical models that have been translated, perhaps with some additional discussion of culturally specific foods. Although translated and cultural tailored diabetes education was found to promote a greater glycemic improvement compared to usual care (Nam, Janson, Stotts, Chesla & Kroon, 2012), health professionals have been criticised for over-focusing on the incorporation of culturally specific content including language, food patterns, values and customs, while very often not considering matching the delivery format to their patient-participants' cultural process of learning. Given that delivering DSME is about facilitating change of lifestyle habits and promoting adoption of self-care behaviours, cultural tailoring needs to be more than change of language and design with considerations of patients' cultural beliefs, learning orientation, lifestyle behaviours and healthcare needs. Prior to commencement of this doctoral study, the thesis author and her team conducted a small study with Australian Chinese patients with diabetes and found Chinese patients complaining that a language-translated diabetes education tool, even though it discussed traditional cuisine, was inadequate in meeting their needs. They reported that Western participatory diabetes education was quite foreign, contributing to additional diabetes distress to self-management (Choi, Walker, Ralston & Palermo, 2015). It was suggested that this may perhaps be due to years of exposure to top-down directive health education practice led by the Patriotic Health Campaign Committee in China (Wang, 2000), promoting rigid thinking and a passive learning pattern (Choi, Walker, Ralston & Palermo, 2015). Such unique learning orientations appear to conflict with the principles of educational theories which form the basis of the best practice guidelines for DSME. There is a need to explore further the diabetes education preferences of the Chinese in more robust designs.

### Conflicting diabetes education delivery approach

As discussed earlier, DSME is underpinned by the various educational theories and behaviour change promotion theories which inform Western strategies for diabetes education (Colagiuri et al., 2009) to motivate adoption of healthy behaviours. These theories promote a person-centred approach where the patient actively participates and decides what is to be learned and what action is to be taken for management of their diabetes. This approach, however, appears to conflict with the Confucian



teaching which often shapes Chinese people's behaviours. Many Chinese learners prefer to take a more passive and compliant approach during education, and tend to accept new knowledge from a respected teacher unquestioningly (Biggs, 1996). In the West, the didactic information-giving education format has long been considered to be a less effective approach to diabetes education and an autonomy-promoting patient-empowerment approach had been replaced as standards of care (Funnell & Anderson, 2004). Such an empowerment model, however, may fit well with the individualistic-orientated patients of the West, yet the lack of clear instructions clashes with the Chinese cultural values of uncertainty avoidance (Hall, 1976). Education researchers who have studied students from Confucian-heritage cultures (including the Chinese) have highlighted their unique learning approach, including: *memorisation with understanding*, *effort attribution* (ability can be improved by working hard) and an *unquestioning acceptance of knowledge* from their teacher (Rao & Chan, 2009). This suggests that Chinese patients might learn with a concrete-sequential orientation during DSME and could appreciate didactic information-giving education, rather than one with an empowerment model. Furthermore, Confucian teaching also places stress on expectations that each individual should fulfil his delineated role to maintain social harmony and a stable hierarchical social structure (Huang & Charter, 1996). Chinese patients are likely to believe that they should act as obedient learners during class and do as they are told in adopting lifestyle changes.

The key focus of this thesis is an exploration of influence of Chinese cultural values and orientations on the learning and lifestyle-changing behaviours in the context of DSME, as reflected by how DSME was culturally tailored when delivered to Chinese patients, as well as observed patient-behaviours during DSME.

## Summary

The growing Chinese Australian population combined with the known high prevalence of type 2 diabetes suggests that the Australian healthcare system is likely to face increasing pressure in providing diabetes care for Chinese Australians with diabetes. The current Australian diabetes care model is underpinned by theories, including Wagner's chronic care model, various health education and behaviour change promotion theories which do not align with traditional Chinese behaviours. Therefore, this thesis focuses on exploring how Confucianism and other Chinese cultural values impact on Chinese behaviours in attending diabetes education and adopting healthy behaviour change, and how Chinese respond to different models and approaches of diabetes education.

# CHAPTER THREE: SYSTEMATIC LITERATURE REVIEW AND META- ANALYSIS

玉不琢，不成器；人不學，不知道

Jade must be cut to make it a useful thing.  
Man must be educated to learn his purpose in life.

## Preamble

This chapter describes a systematic review and meta-analysis (in the form of a published paper, with supplementary materials). The review aimed to determine the effective diabetes education approaches for Chinese people with type 2 diabetes. The review was conducted by synthesising results from both English- and Chinese-language publications on Chinese diabetes education over the past ten years, seeking clinical recommendations on the most effective education approaches for glycemic improvement for Chinese people with diabetes.

## A systematic literature review and meta-analysis

Despite the substantial body of evidence on clinically-effective diabetes education, much of this evidence is based on Caucasian studies and literature written in English. At the time of this review, there was no synthesised evidence quantifying the effectiveness of diabetes education for the Chinese population. Also, it is considered that the education approach and delivery format is the first to be considered when planning and designing a DSME (Haas et al., 2012); therefore, this review aimed (i) to measure the effect-size of DSME on Chinese patients, and (ii) to seek specific clinical recommendations on the most effective education approaches for glycemic improvements for Chinese people with diabetes.

This study was designed to answer the following research question:

What is the most clinically-effective diabetes education approach for Chinese patients with type 2 diabetes, to reduce glycated haemoglobin?

This paper was published in *Diabetes Research and Clinical Practice* in 2016, and is presented in its published format within this thesis.

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## Review

Diabetes education for Chinese adults with type 2  
diabetes: A systematic review and meta-analysis of  
the effect on glycemic control

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## ABSTRACT

**Aims:** The purpose of this study is to systematically review evidence in English and Chinese publications to determine the size of glycemic effect of different diabetes education approaches for Chinese patients.

**Methods:** CINAHL Plus, Embase, Ovid Medline, Scopus and the China National Knowledge Infrastructure database were searched. Studies were included if they were randomised controlled trials with a detailed description of education approach, with more than 50 Chinese-adult participants, reporting actual glycemic outcome and with at least 3-month follow-up. Data was systematically extracted and cross-checked by the authors. Methodological quality was assessed.

**Results:** Fifty-three studies, including five English and 48 Chinese publications, were included. The overall weighted mean difference (WMD) in glycated haemoglobin (HbA<sub>1c</sub>) was -1.19% (-13 mmol/mol). *Ongoing regular education* was most-commonly employed, with a reported WMD of -2.02% (-22 mmol/mol). Glycemic control was further enhanced in studies using information reinforcement strategies.

**Conclusions:** Diabetes education in any format generates glycemic improvement for Chinese patients, but is particularly effective when an *ongoing regular education* is employed. Innovative strategies aligned with cultural concepts, such as employing patient examination to reinforce diabetes management knowledge and/or involving family in patient care deserve further trial to determine whether they enhance glycemic control in this group.

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## 1. Introduction

Diabetes education refers to the process of a clinician-educator facilitating the development of skills, knowledge and the ability to self-care in patients with diabetes [1]. Diabetes education plays an important role to support self-management and the adoption of a healthy lifestyle that can optimise glycaemic control and reduce risk of diabetic complications [2]. Evidence on the effectiveness of diabetes education has primarily been based on interventions undertaken in Caucasian communities [3]. Despite the fact that the Chinese constitute the world's largest population with diabetes [4], recommendations regarding the most appropriate education approaches for this ethnic group are lacking. Current Chinese Guidelines for Type 2 Diabetes [5] are largely based on Caucasian studies. Given that health behaviours and practices are strongly shaped by culture [6], education approaches simply translated from western literature are unlikely to meet Chinese patients' needs [7].

A large body of literature in both English and Chinese has reported diabetes education interventions in Chinese populations. A previous meta-analysis on data from interventions among Chinese populations [8] has focused on examining the summative impact of diabetes education on anthropometric, biochemical and psychological indicators. Glycaemic improvement was reported to be greatest at the twelve-month follow-up. This, however, was based on only four studies. Lou et al. [9] systematically reviewed both English- and Chinese literature on diabetes education in China and highlighted the importance of improving study design and training of diabetes educators. A narrative literature review [10] has explored community diabetes education practices in China and discussed the possibility of standardising education approaches for optimal clinical results. While these quantitative and qualitative reviews have contributed to our knowledge of the development of diabetes education for Chinese, there is still a lack of clear practice recommendations on specific practical education approaches and strategies that meet the unique needs of the Chinese patients and result in the greatest glycaemic improvement.

The main objective of this study was to systematically review evidence in both English- and Chinese-language publications to quantitatively measure the glycaemic effect of various diabetes education approaches for Chinese patients. Specifically, this review sought specific clinical recommenda-

tions on the best educational approaches for effective glycaemic improvements for Chinese diabetes patients.

## 2. Methods

### 1. Data sources and searches

A systematic literature search was performed to retrieve publications on diabetes education interventions targeted at Chinese patients with type 2 diabetes. The search was undertaken in two parts. Firstly, electronic databases, including CINAHL Plus, Embase, Ovid Medline and Scopus were searched in English (referred to as 'English Search') for studies between January 2004 and April 2014. Combinations of keywords relating to China, type 2 diabetes and patient education were used (search strategy available from author). Articles retrieved were written either in English or in Chinese with an English title. Their references were exported to an Endnote X7 file (Thomson Reuters EndNote X7, Carlsbad, CA). Secondly, for the Chinese literature (referred to as 'Chinese search'), the China National Knowledge Infrastructure (CNKI) database was searched in Chinese using the keywords '糖尿病' (diabetes) and '教育' (education). Titles and abstracts of the Chinese articles were then printed for further review.

The inclusion of both English- and Chinese-language publications not only allowed a larger literature survey, it also ensured inclusion of studies done in China, specifically on the population of interest, and not as yet reported in the English literature.

### 2. Study selection

Duplicate articles were removed from retrieved studies before screening remaining articles (in English or Chinese) by title and abstract to identify studies that met the following inclusion criteria: describes a controlled trial on a diabetes education intervention given to Chinese adults (18+ years) with type 2 diabetes. Studies were coded according to the primary reason for their exclusion. Studies that clearly met the inclusion criteria and articles with insufficient detail in the title and abstract to make a clear decision were included for further review. Full text versions of all included publications were retrieved. Studies included for subsequent selection and review met both the initial inclusion criterion (as above) and additional criteria, introduced to narrow down the focus

and enhance the quality of evidence. First, randomised control trials providing a detailed description of the intervention; and reporting baseline clinical data, from over 50 participants in both the intervention and control group, and with >80% retention rate were selected. Next, publications were identified reporting HbA1c (glycated haemoglobin) in absolute values (rather than percentage improvement) and with a clearly-stated follow-up duration of 3 months or more. If two or more studies were identified with identical methodological descriptions and results, the earliest publication was selected. Authors were contacted for missing data and studies were excluded if no contact could be made.

### 2.3. Data extraction and quality assessment

Each included study was evaluated using a standard data extraction form which included: research question, study design, methodological quality, study population, setting, intervention details, follow-up period, outcome measures and results. Data extraction for all articles in English was done by both the first researcher (TC, who is Chinese) and a second researcher (CP or KZW). Articles in Chinese were read and reviewed by TC, who abstracted their information onto the data extraction form in English. Data extraction of 10 articles in Chinese chosen at random was completed by another Chinese researcher (JHL) as a cross-check on the review process. If any aspect of the data extraction was unclear to the first researcher (TC), a second researcher was consulted (CP or KZW). Where there were missing or insufficient outcome data, authors of the article were contacted, when possible, for the information.

A checklist [11] from the Academy of Nutrition and Dietetics was used to assess the methodological quality of retrieved studies, with the modification that study blinding was not assessed since blinding is not feasible within an education program.

### 2.4. Data synthesis and analysis

Retrieved studies were classified into categories based on the main primary educational approach adopted for the intervention group. The control groups were categorised based on their primary educational approach into: usual care, no education, or one of the intervention groups. Table 1 describes each education approach.

For the meta-analysis, a random-effects model was used to determine weighted mean difference (WMD) in HbA1c between intervention and control groups in those studies reporting mean change in HbA1c. Similarly, WMD was calculated using the pre-intervention and post-intervention HbA1c values to provide a within-group effect of each intervention and control approach. Sensitivity analysis for each diabetes education approach was also conducted to examine qualitatively the within-group effect influence for the following measures: methodological quality, participants' baseline glycemia, length of follow-up, and study origin (within or outside China). The variance for the random-effects model was computed using the DerSimonian and Laird formula [12], and reported the *P* test to evaluate heterogeneity. Publication bias was assessed by a funnel plot. The meta-analysis was performed using STATA version 12 (StataCorp, College Station, TX, USA) and RevMan version 5.3 (The Cochrane Collaboration, Oxford, England) [13].

In this review, the results of WMD are reported in the National Glycohemoglobin Standardisation Program in%, followed by the International Federation of Clinical Chemistry unit in mmol/mol in brackets [14].

## 3. Results

The initial database searches identified a total of 1556 articles in English and 2000 articles in Chinese of which 53 studies, (five in English, 48 in Chinese) were included for this review

Table 1 – Outline of each education approach.

Education approach	Description
<b>Intervention</b>	
Goal setting/motivational interviewing [49,55,65]	Education employing goal setting or motivational interviewing techniques
Education involving family [56,57]	Education attended by patients with family
Ongoing regular education [16,26,30–55]	Short education (e.g. 30–150 min) conducted regularly throughout the whole study period
Intensive short-duration education [15–22]	Intensive education over a short period of time, e.g. 3–8 weeks and was followed-up to evaluate effects
Use of technology [22,23,61–64]	Education using personal electronic platform, telephone coaching or short message system (SMS)
Peer-learning approach [26,48,53,58–60]	Education via facilitated discussion, or use of the Diabetes Conversation Maps™
Coordinated education across settings [23–28]	Coordinated education from hospital, community to home
Self-education [18,58,59]	Provision of written materials for self-education
Education focused on diet [36,66]	Nutrition education with meal planning
Calculating treatment plan [27–29]	Education with focus on calculating dietary needs
<b>Control</b>	
Usual care [15,17,20,21,24,25,28,31–35,37,39,40,42,45,47,51,52,56,57,60–64,66,67]	Usual outpatient or medical care
No education [43,50,54,65]	Specified no diabetes education or lack of data



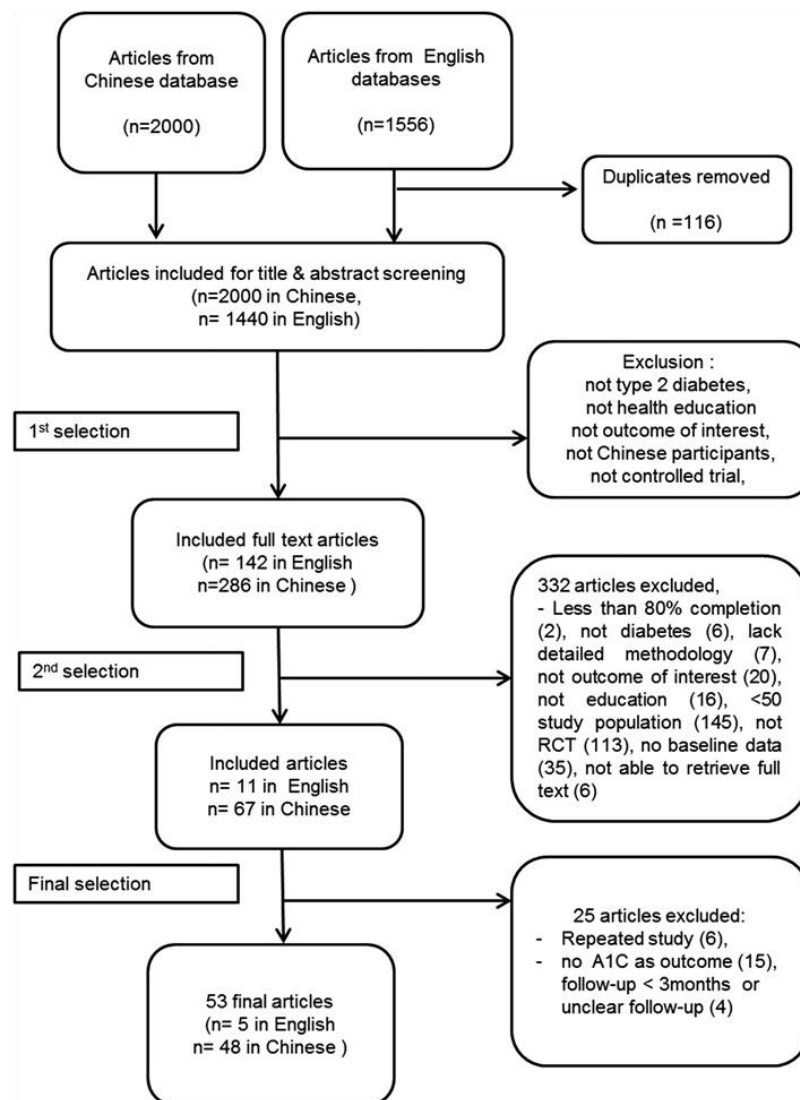


Fig. 1 – Flowchart to illustrate the process of identification of studies for the meta-analysis.

after three levels of selection (Fig. 1). These were categorised by primary diabetes education approach (Table 1).

Table 2 summarises the characteristics of included studies. The pooled number of participants in each education approach ranged from 140 to 2743. Only six studies [15,21,49,61,62,67], were not conducted in China, and five of these were in English. All studies conducted in China were in Chinese. Only six studies were conducted on participants with optimal glycemic control (HbA1c < 7%). Thirty of 53 included studies were of neutral methodological quality, mainly due to the non-reporting of inclusion criteria. Follow-up periods of included studies ranged from 3 to 15 months.

The pooled effect size in HbA1c of each educational approach plus study details are presented in Table 3 (further details on sensitivity analyses are available from author).

The graphical funnel plot of included studies did not display asymmetry indicative of publication bias.

#### 1. Comparing effects between intervention and control

Across the four studies reporting mean change in glycaemia [38,61,63,67], the WMD in HbA1c was - 1.19% (- 13 mmol/mol) in the intervention group compared to the control group (Fig. 2). Studies with less than 6 months follow-up ( $n=3$ ) and studies of positive quality ( $n=3$ ), achieved a greater decrease in HbA1c.

#### 2. Comparing effect within intervention approaches

Across all diabetes education interventions, the overall WMD in HbA1c was - 1.75% (- 19 mmol/mol) (Table 3; further details

Table 2 – Characteristics and results of included studies. Each study was of parallel design comparing an intervention group [I] with a control group [C].

Reference (year)	Quality	Country, glycemic control	Follow-up (mo)	Group No.	Intervention	Results (mean ± SD in A1c) (%/mmol/mol)	
						Pre-	Post-
Cai et al. [30]	N	China, poor	8	[I] 64	Ongoing regular education	11.1 ± 1.8/98 ± 19.7	7.1 ± 1.2/54 ± 13.1
				[C] 63	Ongoing regular education	10.7 ± 1.6/93 ± 17.5	7.5 ± 1.1/58 ± 12.0
Chen et al. [16]	N	China, poor	12	[I] 74	Intensive short-duration education	10.9 ± 1.5/96 ± 16.4	6.5 ± 1.1/48 ± 12.0
				[C] 71	Ongoing regular education	11.2 ± 1.6/99 ± 17.5	10.8 ± 1.4/95 ± 15.3
Chen and Zhu [42]	N	China, poor	6	[I] 80	Ongoing regular education	10.61 ± 1.27/92 ± 13.9	7.13 ± 1.12/54 ± 12.2
				[C] 70	Usual care	10.53 ± 1.56/91 ± 17.1	9.04 ± 1.15/75 ± 12.6
Fang [25]	P	China, poor	12	[I] 107	Coordinated education across settings	7.49 ± 2.08/58 ± 22.7	5.52 ± 1.22/37 ± 13.3
				[C] 107	Usual care	6.89 ± 1.95/52 ± 21.3	6.81 ± 1.9/51 ± 20.8
Huang [45]	N	China, poor	8	[I] 53	Ongoing regular education	9.3 ± 1.9/78 ± 20.8	6.2 ± 1.4/44 ± 15.3
				[C] 53	Usual care	10.4 ± 1.2/90 ± 13.1	9.0 ± 1.6/75 ± 17.5
Li et al. [51]	P	China, poor	12	[I] 64	Ongoing regular education	7.49 ± 0.9/58 ± 9.8	6.67 ± 0.6/49 ± 6.6
				[C] 55	Usual care	7.66 ± 1.6/60 ± 17.5	7.38 ± 1.18/57 ± 12.9
Li [53]	P	China, poor	6	[I] 60	Peer-learning approach	8.11 ± 1.67/65 ± 18.3	7.03 ± 1.38/53 ± 15.1
				[C] 60	Ongoing regular education	7.6 ± 1.12/60 ± 12.2	6.9 ± 0.67/52 ± 7.3
Li et al. [55]	P	China, poor	6	[I] 51	Goal setting/motivational interviewing	10.1 ± 2.7/87 ± 29.5	7.9 ± 1.5/63 ± 16.4
				[C] 50	Ongoing regular education	9.7 ± 3.5/83 ± 38.3	8.0 ± 1.5/64 ± 16.4
Li et al. [26]	P	China, poor	18	[I] 140	Coordinated education across settings	8.18 ± 2.25/66 ± 24.6	6.39 ± 2.05/46 ± 22.4
				[C] 140	Ongoing regular education	8.21 ± 2.43/66 ± 26.6	7.48 ± 2.14/58 ± 23.4
Li [47]	P	China, poor	10	[I] 109	Ongoing regular education	8.19 ± 1.94/66 ± 21.2	6.79 ± 0.41/51 ± 4.5
				[C] 109	Usual care	7.81 ± 1.41/62 ± 15.4	7.18 ± 0.73/55 ± 8.0
Liu et al. [31]	N	China, poor	8	[I] 90	Ongoing regular education	10.5 ± 2.1/91 ± 23.0	7.2 ± 1.1/55 ± 12.0
				[C] 90	Usual care	11.1 ± 1.8/98 ± 19.7	8.1 ± 1.6/65 ± 17.5
Liu [18]	N	China, poor	3	[I] 50	Intensive short-duration education	7.9 ± 2.0/63 ± 21.9	6.89 ± 1.59/52 ± 17.4
				[C] 50	Self-education	7.6 ± 2.1/60 ± 23.0	6.89 ± 1.6/52 ± 17.5
Luo et al. [28]	N	China, poor	12	[I] 165	Coordinated education across settings	7.83 ± 1.32/62 ± 14.4	6.93 ± 0.48/52 ± 5.2
				[C] 132	Usual care	7.92 ± 1.27/63 ± 13.9	7.35 ± 0.56/57 ± 6.1
Lu [39]	N	China, poor	6	[I] 55	Ongoing regular education	12.6 ± 3.2/114 ± 35.0	6.8 ± 1.2/51 ± 13.1
				[C] 65	Usual care	12.4 ± 3.3/112 ± 36.1	8.3 ± 2.8/67 ± 30.6
Mei [44]	N	China, poor	6	[I] 66	Ongoing regular education	8.25 ± 5.0/67 ± 54.7	6.3 ± 1.5/45 ± 16.4
				[C] 65	Ongoing regular education	8.8 ± 1.9/73 ± 20.8	7.2 ± 1.6/55 ± 17.5
Pang [19]	N	China, poor	3	[I] 73	Intensive short-duration education	9.3 ± 1.3/78 ± 14.2	7.0 ± 1.1/53 ± 12.0
				[C] 73	Usual care	8.8 ± 1.6/73 ± 17.5	7.8 ± 1.6/62 ± 17.5
Qi et al. [29]	N	China, poor	3	[I] 65	Calculating treatment plan	7.12 ± 1.19/54 ± 13.0	6.45 ± 0.95/47 ± 10.4
				[C] 60	Calculating treatment plan	7.37 ± 1.35/57 ± 14.8	6.91 ± 1.14/52 ± 12.5
Sun et al. [32]	N	China, poor	6	[I] 200	Ongoing regular education	9.7 ± 1.6/83 ± 17.5	7.6 ± 1.4/60 ± 15.3
				[C] 100	Usual care	9.5 ± 1.9/80 ± 20.8	8.2 ± 1.5/66 ± 16.4
Sun et al. [33]	P	China, poor	3	[I] 68	Ongoing regular education	9.1 ± 3.4/76 ± 37.2	6.5 ± 1.4/48 ± 15.3
				[C] 66	Usual care	8.8 ± 4.1/73 ± 44.8	8.5 ± 3.8/69 ± 41.5
Sun and Lv [40]	N	China, poor	12	[I] 90	Ongoing regular education	13.1 ± 1.7/120 ± 18.6	6.5 ± 1.7/48 ± 18.6
				[C] 90	Usual care	11.9 ± 2.0/107 ± 21.9	8.1 ± 2.3/65 ± 25.1
Wang and Hu [41]	N	China, poor	6	[I] 60	Self-education	9.2 ± 1.4/77 ± 15.3	7.9 ± 1.9/63 ± 20.8
				[C] 60	Ongoing regular education	9.3 ± 1.9/78 ± 20.8	7.9 ± 2.1/63 ± 23.0

(continued on next page)



Table 2 – (continued)

Reference (year)	Quality	Country, glycemic control*	Follow-up (mo)	Group No.	Intervention	Results (mean ± SD in Pre-	A1c) (%/mmol/mol) Post- <sup>***</sup>
Wang et al. [54]	P	China, poor	12	[I] 60	Ongoing regular education	7.72 ± 1.62/61 ± 17.7	6.62 ± 0.73/49 ± 8.0
				[C] 60	No education	7.68 ± 1.58/60 ± 17.3	7.65 ± 1.64/60 ± 17.9
Wei [17]	N	China, poor	3	[I] 81	Intensive short-duration education	9.2 ± 1.2/77 ± 13.1	7.1 ± 1.2/54 ± 13.1
				[C] 81	Usual care	8.9 ± 1.4/74 ± 15.3	7.9 ± 1.5/63 ± 16.4
Wu et al. [36]	N	China, poor	5	[I] 80	Education focused on diet	7.12 ± 1.2/54 ± 13.1	6.35 ± 0.87/46 ± 9.5
				[C] 80	Ongoing regular education	7.31 ± 1.18/56 ± 12.9	6.91 ± 1.21/52 ± 13.2
Wu et al. [60]	P	China, poor	6	[I] 156	Peer-learning approach	10.39 ± 2.2/90 ± 24.0	6.75 ± 0.6/50 ± 6.6
				[C] 159	Usual care	10.74 ± 2.19/93 ± 23.9	7.87 ± 0.76/63 ± 8.3
Xiao et al. [57]	P	China, poor	6	[I] 50	Education involving family	9.0 ± 2.8/75 ± 30.6	7.1 ± 1.5/54 ± 16.4
				[C] 50	Usual care	8.9 ± 3.2/74 ± 35.0	7.9 ± 1.7/63 ± 18.6
Xie et al. [22]	P	China, poor	12	[I] 124	Use of technology	8.7 ± 2.1/72 ± 23.0	7.1 ± 1.2/54 ± 13.1
				[C] 72	Intensive short-duration education	9.2 ± 2.2/77 ± 24.0	7.6 ± 1.1/60 ± 12.0
Xie et al. [65]	N	China, poor	10	[I] 78	Goal setting/motivational interviewing	17.82 ± 1.39/171 ± 15.2	8.56 ± 2.12/70 ± 23.2
				[C] 78	No education	18.31 ± 1.57/177 ± 17.2	17.69 ± 3.01/170 ± 32.9
Xu [37]	N	China, poor	6	[I] 154	Ongoing regular education	8.3 ± 0.33/67 ± 3.6	6.2 ± 0.39/44 ± 4.3
				[C] 154	Usual care	8.18 ± 0.26/66 ± 2.8	8.2 ± 0.34/66 ± 3.7
Yan et al. [48]	P	China, poor	3	[I] 62	Peer-learning approach	9.76 ± 0.15/83 ± 1.6	7.82 ± 0.11/62 ± 1.2
				[C] 50	Ongoing regular education	9.55 ± 0.11/81 ± 1.2	8.48 ± 0.12/69 ± 1.3
Yan et al. [59]	P	China, poor	6	[I] 60	Peer-learning approach	8.5 ± 2.5/69 ± 27.3	7.9 ± 1.3/63 ± 14.2
				[C] 60	Self-education	8.2 ± 2.0/66 ± 21.9	7.3 ± 1.6/56 ± 17.5
Yao et al. [50]	N	China, poor	12	[I] 81	Ongoing regular education	9.0 ± 1.2/75 ± 13.1	7.1 ± 1.2/54 ± 13.1
				[C] 86	No education	8.9 ± 1.5/74 ± 16.4	8.7 ± 1.8/72 ± 19.7
Yu et al. [56]	P	China, poor	12	[I] 90	Education involving family	10.05 ± 2.2/87 ± 24.0	7.31 ± 1.36/56 ± 14.9
				[C] 90	Usual care	9.83 ± 2.28/84 ± 24.9	8.54 ± 2.06/70 ± 22.5
Zeng et al. [63]	N	China, poor	5	[I] 54	Use of technology	9.89 ± 1.78/85 ± 19.5	7.23 ± 1.29/56 ± 14.1
				[C] 52	Usual care	10.1 ± 1.84/87 ± 20.1	8.21 ± 1.3/66 ± 14.2
Zhang and Xu [43]	N	China, poor	6	[I] 64	Ongoing regular education	7.8 ± 1.04/62 ± 11.4	6.7 ± 0.63/50 ± 6.9
				[C] 62	No education	7.7 ± 0.98/61 ± 10.7	7.2 ± 0.74/55 ± 8.1
Zhang et al. [46]	P	China, poor	5	[I] 60	Peer-learning approach	7.8 ± 3.1/62 ± 33.9	7.0 ± 1.5/53 ± 16.4
				[C] 60	Ongoing regular education	8.2 ± 2.6/66 ± 28.4	7.5 ± 1.8/58 ± 19.7
Zhang [24]	N	China, poor	12	[I] 54	Coordinated education across settings	8.2 ± 1.0/66 ± 10.9	7.2 ± 1.1/55 ± 12.0
				[C] 50	Usual care	8.4 ± 1.5/68 ± 16.4	8.3 ± 1.4/67 ± 15.3
Zhang et al. [66]	N	China, poor	15	[I] 93	Education focused on diet	6.96 ± 1.31/53 ± 14.3	6.23 ± 0.76/45 ± 8.3
				[C] 85	Usual care	7.28 ± 1.66/56 ± 18.1	6.77 ± 0.98/50 ± 10.7
Zheng et al. [35]	N	China, poor	10	[I] 51	Ongoing regular education	9.2 ± 1.9/77 ± 20.8	6.2 ± 1.5/44 ± 16.4
				[C] 51	Usual care	10.5 ± 1.2/91 ± 13.1	9.1 ± 1.7/76 ± 18.6
Zhong et al. [58]	N	China, poor	3	[I] 65	Peer-learning approach	7.12 ± 1.19/54 ± 13.0	6.45 ± 0.95/47 ± 10.4
				[C] 60	Self-education	7.37 ± 1.35/57 ± 14.8	6.91 ± 1.14/52 ± 12.5
Zhou et al. [23]	P	China, poor	12	[I] 50	Use of technology	8.9 ± 1.27/74 ± 13.9	8.3 ± 1.26/67 ± 13.8
				[C] 50	Coordinated education across settings	8.6 ± 1.16/70 ± 12.7	8.6 ± 1.35/70 ± 14.8
Gu et al. [52]	P	China, good	12	[I] 335	Ongoing regular education	7.0 ± 1.5/53 ± 16.4	6.5 ± 1.1/48 ± 12.0
				[C] 326	Usual care	6.8 ± 1.4/51 ± 15.3	6.9 ± 1.3/52 ± 14.2
Huang et al. [20]	N	China, good	3	[I] 75	Intensive short-duration education	6.8 ± 1.8/51 ± 19.7	5.1 ± 1.4/32 ± 15.3
				[C] 75	Usual care	6.9 ± 1.7/52 ± 18.6	8.1 ± 1.8/65 ± 19.7

Liu et al. [64]	P	China, good	3	[I] 76	Use of technology	6.91 ± 2.06/52 ± 22.5	6.31 ± 1.46/45 ± 16.0
Sun et al. [38]	P	China, good	5.5	[C] 80	Usual care	7.0 ± 1.47/53 ± 16.1	7.25 ± 1.57/56 ± 17.2
Wang et al. [34]	N	China, good	3	[I] 63	Ongoing regular education	Study reported mean change	
Yang et al. [27]	N	China, good	6	[C] 63	Ongoing regular education	6.72 ± 1.74/50 ± 19.0	6.12 ± 1.48/43 ± 16.2
Ko et al. [15]	P	Hong Kong, poor	12	[I] 56	Usual care	6.91 ± 1.67/52 ± 18.3	6.98 ± 1.72/53 ± 18.8
Lee et al. [21]	P	Hong Kong, poor	6.5	[C] 57	Calculating treatment plan	5.76 ± 0.87/39 ± 9.5	5.21 ± 0.72/33 ± 7.9
Chen et al. [49]	N	Taiwan, poor	3	[I] 90	Coordinated education across settings	5.82 ± 0.77/40 ± 8.4	6.06 ± 1.13/43 ± 12.4
Huang et al. [67]	P	Taiwan, poor	12	[C] 88	Intensive short-duration education	8.6 ± 1.6/70.0 ± 17.5	8.1 ± 1.5/65 ± 16.4
Jian et al. [61]	P	Taiwan, poor	6	[I] 84	Usual care	8.4 ± 1.2/68 ± 13.1	8.2 ± 1.4/66 ± 15.3
Lee et al. [62]	N	Taiwan, poor	9	[C] 73	Intensive short-duration education	8.18 ± 0.36/66 ± 3.9	7.2 ± 0.27/55 ± 3.0
				[I] 125	Usual care	8.04 ± 0.31/64 ± 3.4	7.47 ± 0.25/58 ± 2.7
				[C] 125	Goal setting/motivational interviewing	8.97 ± 2.17/75 ± 23.7	8.16 ± 1.73/66 ± 18.9
				[I] 75	Ongoing regular education	8.53 ± 1.82/70 ± 19.9	8.48 ± 1.78/69 ± 19.5
				[C] 79	Calculating treatment plan	Study reported mean change	
				[I] 67	Usual care		
				[C] 67	Use of technology	11.3 ± 1.9/100 ± 20.8	8.4 ± 1.8/68 ± 19.7
				[I] 134	Usual care	10.9 ± 2.0/96 ± 21.9	10.8 ± 2.2/95 ± 24.0
				[C] 140	Use of technology	9.03 ± 2.79/75 ± 30.5	6.74 ± 2.12/50 ± 23.2
					Usual care	8.95 ± 2.23/74 ± 24.4	7.42 ± 1.65/58 ± 18.0

Abbreviations: [I] intervention group; [C] control group; P: positive; N: neutral.  
 \* Glycemic control poor = baseline A1c P 7.0.  
 \*\* Mean change was available for a few studies: Huang et al. [67]: - 0.5 ± 1.1/- 5.5 ± 12.0 [I], - 0.1 ± 1.5/- 1.1 ± 16.4 [C]; Jian et al. [61]: - 2.9 ± 1.7/- 31.7 ± 18.6 [I], - 0.1 ± 2.1/- 1.1 ± 23.0 [C]; Sun et al. [38]: - 0.8 ± 0.1/- 8.7 ± 1.1 [I], 0.1 ± 0.2/1.1 ± 2.2 [C]; Zeng et al. [63]: - 2.66 ± 2.07/- 29.1 ± 22.6 [I], - 1.89 ± 2.03/- 20.7 ± 22.2 [C].

Table 3 – Summary effects for change in HbA1c between pre- and post-intervention.

Analysis of approach	No. of studies	No. of participants	WMD (%/mmol/mol)	95% CI (%/mmol/mol)	P
<b>Mean change</b>					
Intervention vs control	4	544	-1.19/-13.0	-1.92,-0.46/-21.0,-5.0	92%
<b>Overall effect</b>					
Intervention	68	5565	-1.75/-19.0	-1.96,-1.53/-21.4,-16.7	98%
Control	34	3029	-0.87/-8.5	-1.15,-0.60/-12.6,-6.6	96%
<b>Individual approaches</b>					
Goal setting/motivational interviewing	3	233	-4.09/-44.7	-9.76,1.57/-233.0,17.2	100%
Education involving family	2	140	-2.40/-26.2	-3.21,-1.59/-35.1,-17.4	61%
Ongoing regular education	28	2486	-2.02/-22.0	-2.38,-1.64/-26.0,-17.9	98%
Intensive short-duration education	8	581	-1.83/-20.0	-2.65,-1.00/-29.0,-10.9	98%
Use of technology	6	505	-1.76/-19.2	-2.54,-0.99/-27.8,-10.8	92%
Peer-learning approach	6	463	-1.49/-16.3	-2.31,-0.67/-25.3,-7.3	97%
Usual care	30	2743	-0.95/-10.4	-1.25,-0.65/-13.7,-7.1	96%
Coordinated education across settings	6	573	-0.90/-9.8	-1.53,-0.27/-16.7,-3.0	94%
Self-education	4	230	-0.81/-8.9	-1.20,-0.43/-13.1,-4.7	41%
Education focused on diet	2	173	-0.75/-8.2	-0.97,-0.53/-10.6,-5.8	0%
Calculating treatment plan	3	181	-0.57/-6.2	-0.77,-0.36/-8.4,-3.9	0%
No education*	4	286	-0.38/-4.2	-0.60,-0.15/-6.6,-4.3	0%

\* Control.

on forest plots and sensitivity tests are available from TC). *Ongoing regular education* was the approach most-commonly employed (28 studies, 2486 participants), especially in China, and gave a WMD in HbA1c of - 2.02% (- 22 mmol/mol). Greater decreases in HbA1c were evident for participants with poor (WMD - 2.13% (- 23 mmol/mol)) rather than good glycemia (WMD - 0.51% (- 6 mmol/mol)). Furthermore, for studies of positive quality ( $n=10$ ), this WMD reduced to - 1.00% (- 11 mmol/mol). After 2011, studies tended restrict *ongoing regular education* to control groups and to explore effects of more innovative approaches, such as *peer-learning* and *goal-setting or motivational interviewing techniques*.

Of all intervention approaches, the *education approach using goal setting or motivational interviewing* and *education involving family* resulted in the greatest WMD in HbA1c (- 4.09% (- 45 mmol/mol) and - 2.40% (- 26 mmol/mol), respectively), although this outcome was non-significant being based on few studies ( $n=3$  and  $n=2$ , respectively) with small sample sizes (233 and 140 participants, respectively). The individual study reporting the greatest WMD in HbA1c [65], employed problem-focused lifestyle plans plus weekly lectures and had a long follow-up period of 10 months. The very large impact on HbA1c of - 9.26% (- 102 mmol/mol) appears clinically unusual.

Other studies reporting large decreases in HbA1c [16,30,39,40] (>4% (44 mmol/mol)) used interventions primarily focused on information reinforcement. Sun and Lv [40] employed the innovative strategy of testing patient's knowledge on the day after the diabetes education lecture, while Cai et al. [30] included post-lecture education with a knowledge quiz. Chen et al. [16] also reinforced diabetes knowledge learning by requiring repeated attendance in an intensive diabetes education program.

Some variations in glycemic effect were evident in studies conducted in different countries. Within the *intensive short-duration education* approach, the effect size was greater when studies were conducted in China rather than in Hong Kong (WMD in HbA1c - 2.20% (- 24 mmol/mol) and - 0.79% (- 9 mmol/mol), respectively). The effect size of an approach that relied on the *use of technology* was greater when studies were conducted in Taiwan compared to in China (WMD in HbA1c - 2.59% (- 28 mmol/mol) versus - 1.36% (- 15 mmol/mol), respectively).

Some intervention approaches, notably: *coordinated education across settings*, *self-education*, *education focused on diet* and *education focused on calculating treatment plan*, had effect sizes for change in HbA1c that were even smaller than those achieved by *usual care*.

### 3.3. Comparing effects within control approaches

The overall WMD in HbA1c of the two control approaches (*usual care* and *no education*) was - 0.87% (- 9 mmol/mol). The *usual care* approach had a WMD in HbA1c - 0.95% (- 10 mmol/mol), while WMD in HbA1c of *no education* was only - 0.38% (- 4 mmol/mol). Many papers provided limited information on what constituted *usual care*, potentially contributing to variable effects on glycemia.

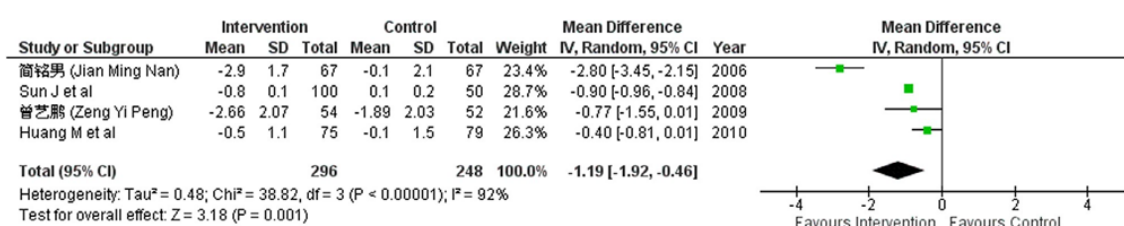


Fig. 2 – Forest plot of mean change in HbA1c.

#### 4. Discussion

The results of this meta-analysis demonstrate an overall glycaemic improvement following diabetes education interventions in Chinese patients. This is consistent with previous meta-analyses among Chinese [8] and Caucasian [68] populations. However, the pooled effect size reported in this review (HbA1c -1.19%/-13 mmol/mol), was much larger than what has been previously reported within Western literature [68] (-0.76%/-8 mmol/mol). This suggests that diabetes education may play a very important role in optimising glycaemic control for Chinese patients. Glycaemic improvement among intervention groups was twice that of control groups (*usual care or no education*), further highlighting the additional glycaemic improvement provided by structured diabetes education as compared to medical intervention alone. According to the pioneering UK Prospective Diabetes Study [69], a 1% (11 mmol/mol) reduction in HbA1c over ten years reduces the risk of diabetic complications by 21%. Therefore, structured diabetes education could play a very significant role in addressing the ever-increasing diabetes cost to the Chinese community.

Among studied interventions, the approach of *ongoing regular education* was most-commonly trialled and provided a WMD in HbA1c of -2.01% (-22 mmol/mol). It appeared a particularly effective approach for those with poor glycaemia and those living in China. As it is costly and resource-intensive the majority of studies delivered this type of education via didactic group lectures rather than to individual patients. Despite criticism of the didactic approach when used in non-Chinese populations [70], it may be an effective strategy for Chinese. In the West, there has been increasing emphasis on the importance of patient engagement and empowerment in diabetes management [71]. Many programs have shifted away from giving didactic instructions to a facilitative collaborative education based on 'empowerment models' [72] that promote greater patient participation and collaboration [68] and strengthen patient autonomy [73] in diabetes self-management. Nevertheless, such standard 'empowerment models' may be less effective for Chinese [71]. Coming under the strong influence of Confucian values, the Chinese tend to adopt a 'concrete-sequential' cognitive style in their learning, where learners follow educator recommendations exactly, with unquestioning acceptance and respect, and do not appreciate active class participation [74]. Chinese populations believe that people are largely similar at birth, and that their later behaviour is then mainly shaped by social moulding and education [75]. Education via a top-down didactic approach

characterises both the general Chinese education system [74] and Chinese public health education [76]. A long exposure to didactic teaching may thus promote expectations of a similar didactic approach in diabetes education among Chinese and may well be the best way to deliver diabetes education for this population.

One known disadvantage of traditional didactic approaches to diabetes education is the relatively slow rate of accumulation of knowledge about the disease [72]. In order to obtain a sustained impact on patients with this approach, regular information reinforcement becomes critical [3]. In our review, all 28 studies employing this *ongoing regular education* approach continued diabetes education throughout the study period, allowing knowledge to accumulate gradually. Some studies [16,30,40] also used innovative strategies to reinforce knowledge accumulation thereby enhancing glycaemic improvement. These strategies included examination of knowledge the day after each educational lecture [40], a post-lecture quiz [30] or compulsory repeat attendance of a lecture series [16]. While such information reinforcement works well for keeping neural pathways active, this approach relates to the typical high-achiever behaviours displayed by many Chinese learners [77], as well as a preference towards the 'repetitive learning-style' that Chinese learners typically use to enforce attachment of meaning to the material learned [78]. Also relating back to the 'concrete-sequential' cognitive learning style of the Chinese, educators emphasised the importance of diabetes management knowledge and expected patient-learners to change their lifestyle behaviours unquestioningly.

Possibly influenced by Western evidence, studies more recently, appear to have moved away from *ongoing regular education* approaches, to trial *peer-learning* and *goal setting/motivational interviewing*. These latter approaches are known to improve glycaemia in the Caucasian populations [79,80] but they seemed to bring diverse and less promising results when used with Chinese. Although the pooled result may have been limited by the low number of studies, it may also have been influenced by the fact that Chinese participants have been exposed for years to 'top-down' education, that tends to promote rigidity of thought and a lack of appreciation for group participation or sharing of experiences with people who are not close family members. One previous study [7] has revealed that Chinese patients poorly understand the concept of disease self-management and when enrolled in participatory diabetes education that focuses on development of autonomy may experience stress, frustration and even anger. Furthermore, the health belief model and the extended



parallel process model which form the basis of individualising health education in goal setting and motivational interviewing have previously been criticised for an individualistic bias where the individual is the locus of choice [81]. In Chinese culture where the importance of collective identity is emphasised and the family is seen as the concentric circle of contacts [82], more studies involving family could be conducted to further examine the impact of this approach.

Although this meta-analysis presented strong results, they may not be entirely applicable across all Chinese sub-populations. Only six of the 53 included studies were conducted outside China (in Taiwan and Hong Kong). It was observed that the *intensive short-duration education* approach was more effective in China than Hong Kong, while *using technology* seemed to result a larger glycemic improvement in Taiwan than in China. It must be noted that despite sharing a common culture, Chinese people are also diverse in religious, political and social ideologies, generating different diabetes care needs [7]. This potentially suggests that acculturation impacts on Chinese patients' needs. Furthermore, there was no study on Chinese migrants and second or third generations in Western countries where the culture of learning could have been shaped by the environment. Therefore, there will not be a one-size-fits-all diabetes education approach applicable to all Chinese sub-populations, especially for those residing outside China.

Although heterogeneity ( $I^2$ ) was very high for most education approaches, the effect on glycemia across all studies favoured HbA1c reduction. The high heterogeneity may reflect the different characteristics of free-living patients, inconsistent education approaches with supplementary education strategies, and contextual factors such as healthcare system structures.

#### 4.1. Strengths and limitations

This systematic review has several strengths. Firstly, both English- and Chinese-language databases were searched for publications, capturing a broader body of literature which was especially important in understanding the effects of diabetes education on the Chinese patients. Next, authors attempted to gain in-depth understanding of the clinical impact by conducting sensitivity tests. This review also has some limitations. Although evidence is suggesting the *ongoing regular education* provided the most promising glycemic reduction, this was, however, drawn from mostly pre- and post-intervention measurements rather than comparing intervention against control. Also as more than half of the included studies were deemed of neutral quality, largely due to lack of detail on inclusion criteria, the strength of findings have been somewhat weakened and this limits the overall quality of the pooled outcome. Additionally, the included Chinese-language studies were often relatively short and provided limited information, making deeper interpretation difficult. Lastly, the duration of study follow-up was only three to 15 months. There is no strong, long term evidence on the retainment of information and lifestyle modification adherence, both of which are critical in the management of type 2 diabetes.

#### 4.2. Conclusion and practice implications

The present study has provided clinical and research implications. Diabetes education is associated with large glycemic improvement for Chinese patients, especially when the *ongoing regular education approach* was used. However, this approach can be relatively costly and resource-demanding. Therefore, innovative strategies in line with cultural concepts, such as employing patient examination to reinforce diabetes management knowledge and potentially involving family could be trialled to enhance glycemic control in this ethnic population group. Future research work should focus on (1) designing controlled trial to test the *ongoing regular education* approach and compare against the most effective western-evidence-based approach, (2) ensuring high quality study design and detailed description of the educational intervention, (3) examining the effectiveness of innovative strategies on sub-groups of Chinese populations and also establishing their long-term impact, and (4) further exploring supplementary strategies to didactic diabetes education that shown to be uniquely effective on this cultural group.

#### Conflicts of interest

None.

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## Supplementary data

In addition to the data published in the journal manuscript the following additional tables and figures have been provided: the participant, intervention, comparator, outcome and study design (PICOS) chart of data extraction providing details on search terms (Table 4); the funnel plot generated to assess publication bias (Figure 3); and the sensitivity tests on effect size in HbA<sub>1c</sub> for each education approach in mean change (between intervention and control, Table 5), intervention (Table 6) and control groups (Table 7). These sensitivity tests were performed to examine qualitatively the within-group effect influence for the following measures: methodological quality, participants' baseline glycemia, length of follow-up, and study origin (within or outside China).

Table 4: PICOS chart of data extraction from a given database (Example: Scopus)

Participants	Interventions	Comparator	Outcomes	Study design
Chinese	Diabetes education	usual care / no education	HbA <sub>1c</sub>	Randomised control trial
<i>Search terms:</i>				
China* Chinese Malaysia* Singapore* Taiwan*	Diabetes Type 2 diabetes Type II diabetes NIDDM T2DM  Health educat* Patient educat* Self-management training Self-management educat* Self-management program Diabetes management			



Figure 3: Funnel plot generated to assess publication bias

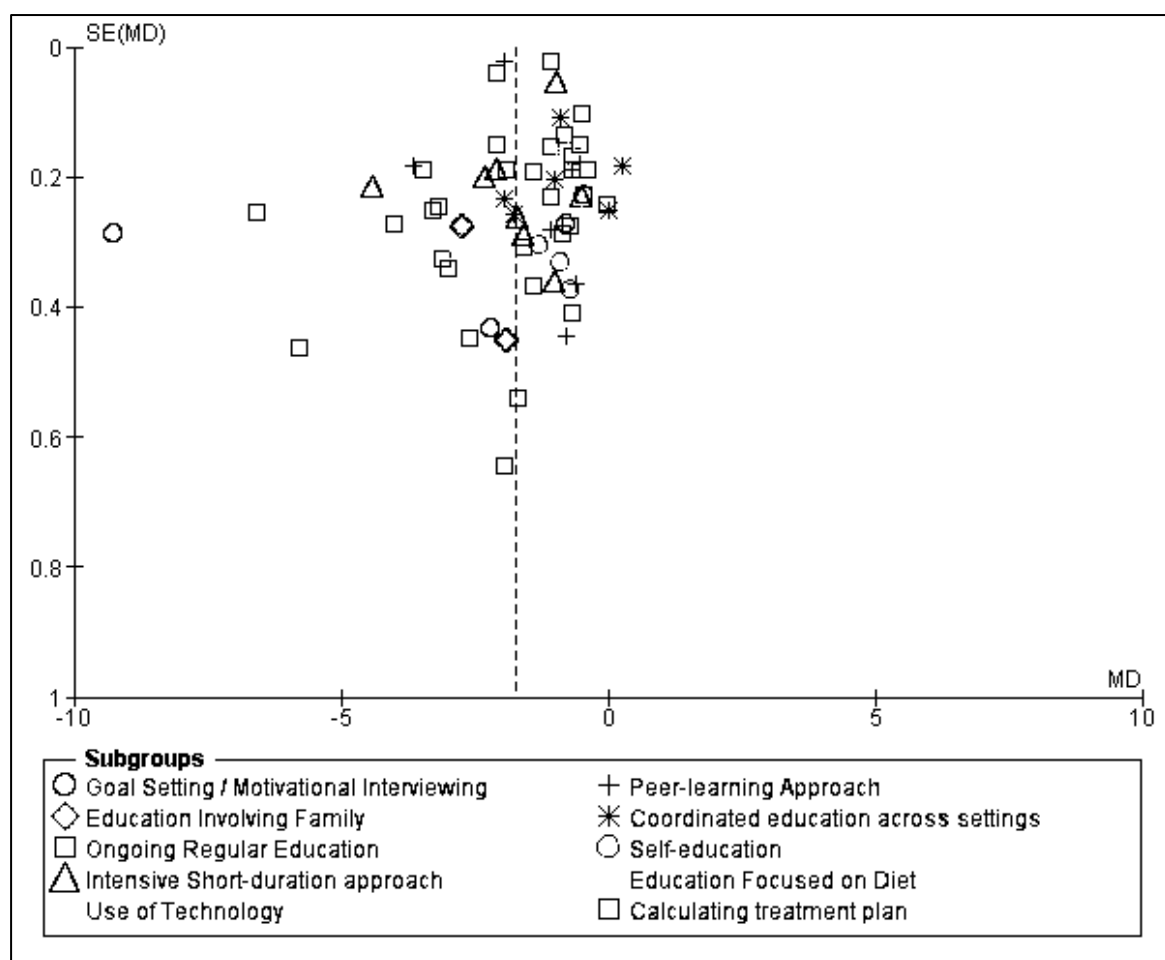


Table 5: Effect size of mean change in HbA1c between intervention and control groups

Analysis of approach (n = studies)	WMD	95%CI	p-value	I <sup>2</sup>
<b>Mean change (effect size between intervention and control)</b>				
Intervention vs control (4)	-1.19 / -13.0	-1.92, -0.46 / -21.0, -5.0	0.001	92%
Poor glycemia (3)	-1.32 / -14.4	-2.83, 0.20 / -30.9, 2.2	0.088	95%
Positive quality papers (3)	-1.31 / -14.3	-2.22, -0.40 / -24.0, -4.4	0.005	95%
Follow-up ≤6mths (3)	-1.48 / -16.2	-2.66, -0.29 / -29.1, -3.2	0.014	94%

Abbreviations: CI: confidence interval; I<sup>2</sup>: heterogeneity; WMD: weighted mean difference

Table 6: Effect size in HbA1c of education approach used in intervention group

Analysis of approach (n = studies)	WMD	95%CI	p-value	I <sup>2</sup>
<b>Pre- and post- intervention (effect size between pre- and post- program)</b>				
Overall effect of intervention (68)	-1.75 / -19.0	-1.96, -1.53 / -21.4, -16.7	0.000	98%
Goal setting / motivational interviewing (3)	-4.09 / -44.7	-9.76, 1.57 / -106.6, 17.2	0.157	100%
Neutral quality papers (2)	-5.03 / -55.0	-13.32, 3.25 / -145.6, 35.5	0.233	100%
Studies undertaken in China (2)	-5.74 / -62.8	-12.66, 1.18 / -138.8, 12.9	0.104	100%
Education involving family (2)	-2.40 / -26.2	-3.21, -1.59 / -35.1, -17.4	0.000	61%
Ongoing regular education (28)	-2.02 / -22.0	-2.38, -1.64 / -26.0, -17.9	0.000	98%
Good glycemia (2)	-0.51 / -5.6	-0.70, -0.32 / -7.7, -3.5	0.000	0%
Poor glycemia (26)	-2.13 / -23.3	-2.52, -1.74 / -27.5, -19.0	0.000	98%
Neutral quality papers (18)	-2.52 / -27.5	-3.11, -1.94 / -34.0, -21.2	0.000	98%
Positive quality papers (10)	-1.00 / -10.9	-1.25, -0.76 / -13.7, -8.3	0.000	84%
Follow-up ≤ 6mths (16)	-1.65 / -18.0	-2.07, -1.24 / -22.6, -13.6	0.000	98%
Follow-up ≥ 6mths (12)	-2.46 / -26.9	-3.41, -1.51 / -37.3, -16.5	0.000	99%
Studies undertaken in China (27)	-2.08 / -22.7	-2.46, -1.71 / -26.9, -18.7	0.000	98%
Intensive short-duration education (8)	-1.83 / -20.0	-2.65, -1.00 / -29.0, -10.9	0.000	98%
Poor glycemia (7)	-1.85 / -20.2	-2.77, -0.92 / -30.3, -10.1	0.000	98%
Neutral quality papers (5)	-2.32 / -25.4	-3.38, -1.25 / -36.9, -13.7	0.000	96%
Positive quality papers (3)	-0.99 / -10.8	-1.45, -0.54 / -15.8, -5.9	0.000	78%
Follow-up ≤ 6mths (4)	-1.85 / -20.2	-2.31, -1.39 / -25.3, -15.2	0.000	74%
Follow-up ≥ 6mths (4)	-1.87 / -20.4	-3.45, -0.28 / -37.7, -3.1	0.021	99%
Studies undertaken in China (6)	-2.20 / -24.0	-3.13, -1.27 / -34.2, -13.9	0.000	96%
Studies undertaken in HK (2)	-0.79 / -8.6	-1.25, -0.33 / -13.7, -3.6	0.001	76%
Use of technology (6)	-1.76 / -19.2	-2.54, -0.99 / -27.8, -10.8	0.000	92%
Poor glycemia (5)	-1.99 / -21.8	-2.81, -1.18 / -30.7, -12.9	0.000	91%

Neutral quality papers (2)	-2.49 / -27.2	-2.92, -2.06 / -31.9, -22.5	0.000	0%
Positive quality papers (4)	-1.42 / -15.5	-2.37, -0.46 / -25.9, -5.0	0.004	93%
Follow-up ≤ 6mths (3)	-2.05 / -22.4	-3.51, -0.59 / -38.4, -6.4	0.006	95%
Follow-up ≥ 6mths (3)	-1.48 / -16.2	-2.38, -0.58 / -26.0, -6.3	0.001	89%
Studies undertaken in China (4)	-1.36 / -14.9	-2.25, -0.47 / -24.6, -5.1	0.003	92%
Studies undertaken in Taiwan (2)	-2.59 / -28.3	-3.19, -2.00 / -34.9, -21.9	0.000	45%
Peer learning approach (6)	-1.49 / -16.3	-2.31, -0.67 / -25.3, -7.3	0.000	97%
Positive quality papers (5)	-1.66 / -18.1	-2.59, -0.73 / -28.3, -8.0	0.000	97%
Coordinated education across settings (6)	-0.90 / -9.8	-1.53, -0.27 / -16.7, -3.0	0.005	94%
Poor glycemia (5)	-1.13 / -12.4	-1.70, -0.56 / -18.6, -6.1	0.000	91%
Neutral quality papers (3)	-0.56 / -6.1	-1.29, 0.18 / -14.1, 2.0	0.138	94%
Positive quality papers (3)	-1.25 / -13.7	-2.48, -0.03 / -27.1, -0.3	0.045	95%
Self-education (4)	-0.81 / -8.9	-1.20, -0.43 / -13.1, -4.7	0.000	41%
Neutral quality papers (3)	-0.80 / -8.7	-1.33, -0.28 / -14.5, -3.1	0.003	59%
Education focused on diet (2)	-0.75 / -8.2	-0.97, -0.53 / -10.6, -5.8	0.000	0%
Calculating treatment plan (3)	-0.57 / -6.2	-0.77, -0.36 / -8.4, -3.9	0.000	0%
Poor glycemia (2)	-0.58 / -6.3	-0.87, -0.30 / -9.5, -3.3	0.000	0%

Abbreviations: CI: confidence interval; I<sup>2</sup>: heterogeneity; WMD: weighted mean difference

Table 7: Effect size in HbA1c of education approach used in control group

Analysis of approach (n = studies)	WMD	95%CI	p-value	I <sup>2</sup>
Pre- and post- intervention (effect size between pre- and post- program)				
Overall effect of control (34)	-0.87 / -9.5	-1.15, -0.60 / -12.6, -6.6	0.000	96%
Usual care (30)	-0.95 / -10.4	-1.25, -0.65 / -13.7, -7.1	0.000	96%
Good glycemia (4)	0.38 / 4.2	-0.08, 0.83 / -0.9, 9.1	0.107	77%
Poor glycemia (26)	-1.16 / -12.7	-1.49, -0.83 / -16.3, -9.1	0.000	97%
Neutral quality papers (18)	-1.20 / -13.1	-1.69, -0.71 / -18.5, -7.8	0.000	97%
Positive quality papers (12)	-0.58 / -6.3	-1.04, -0.13 / -11.4, -1.4	0.012	95%
No education (4)	-0.38 / -4.2	-0.60, -0.15 / -6.6, -1.6	0.001	0%
Neutral quality papers (3)	-0.44 / -4.8	-0.68, -0.19 / -7.4, -2.1	0.000	0%

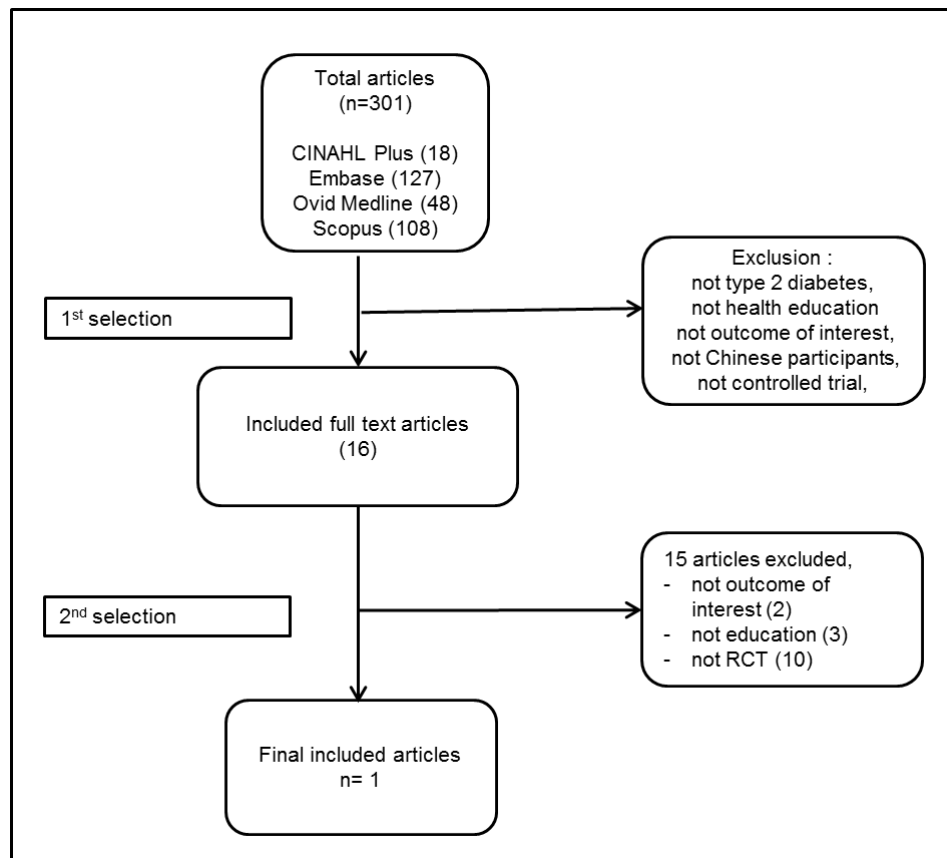
Abbreviations: CI: confidence interval; I<sup>2</sup>: heterogeneity; WMD: weighted mean difference

### Database Search update

A search update was undertaken on 8 November 2016 using the same search strategies on the same English databases (CINAHL Plus, Embase, Ovid Medline and Scopus) as in the published paper. A total of 301 papers that were potentially relevant were identified in this search update – only one of which fulfilled the retrieval criteria (Shi et al., 2015) (Figure 4). An updated search was not undertaken on the Chinese National Knowledge Infrastructure (CNKI) database as the search could not be limited to only include the new timeframe.

Characteristics and results from the one additional included study (Shi et al., 2015) is presented in Table 8. In contrast with the previous database search, this additional paper is the first one to describe a study conducted in China but written in English. It compared two identical education approaches (*intensive short-duration education*) with the intervention group given additional education sessions based on Traditional Chinese Medicine (TCM) principles and management strategies in line with *yin* and *yang* adjustment. This was done by matching food choices, physical activities and self-massage to the change of season. In this study, the results indicated a greater glycemic improvement in the intervention group compared to the control group. This may suggest a further clinical improvement when diabetes education is delivered to Chinese patients in *intensive short-duration education* approach with content on TCM incorporated.

Figure 4: Flowchart to illustrate the process of identification of studies in the update search



Addition of this further paper, now provides a pool of eight studies using the *intensive short-duration education* approach, which was the second most-commonly trialled approach. Although this approach was found to bring a less promising glycemic improvement compared to the *ongoing regular education* approach, it has the virtue of being less resource-intensive. This evidence suggests that in future research, the *intensive short-duration education* approach could be trialled with added innovative strategies, e.g. incorporation of TCM content, post-session examination of knowledge, etc., to find an approach that is clinically effective and culturally appropriate for the Chinese.

Table 8: Characteristics and results of the additional included study. The study was of parallel design comparing an intervention group [I] with a control group [C].

Reference (year)	Quality	Country, glycemic control*	Follow-up (mo)	Group no.	Intervention	Results (mean±SD in A1c) (%/mmol/mol)	
						Pre	Post
Shi et al. (2015)	P	China, poor	12	[I] 129	Intensive short-duration education	9.4 / 79 <sup>#</sup>	5.4 / 36 <sup>#</sup>
				[C] 127	Intensive short-duration education	9.4 / 79 <sup>#</sup>	7.9 / 63 <sup>#</sup>

Abbreviations: [I] intervention group; [C] control group; P: positive

\* Glycemic control poor = baseline A1c ≥ 7.0%

<sup>#</sup> Values interpolated from figure given in the paper

## Summary

This study has summarised the available literature in the past ten years using a systematic review and meta-analysis. It has highlighted some important recommendations for designing diabetes education for Chinese patients:

- (1) Diabetes education can not only bring glycemic improvements for Chinese people, the effect size of diabetes education on Chinese people appeared to be much larger than has been previously reported within Western literature. Therefore, providing diabetes education could be an effective strategy in addressing this increasing health problem in the Chinese population.
- (2) Diabetes education for Chinese people must be designed to align with Chinese learning orientation rather than translating Western evidence-based diabetes education models. The most effective and most commonly employed diabetes education approach for the Chinese was found to be the *ongoing regular education approach*, which involved provision of diabetes management information in an ongoing basis, supporting the Chinese patients' learning and behaviour change process.
- (3) Although the *intensive short-duration education* approach was found to bring a less promising glycemic improvement compared to the *ongoing regular education* approach, it is less resource-intensive. This evidence suggests that in future research, the intensive short-duration education approach could be trialled with added innovative strategies, e.g., incorporation of TCM content, post-session examination of knowledge, etc., to find an approach that is clinically effective and culturally appropriate for the Chinese.

Although this systematic review and meta-analysis identified promising approaches to deliver diabetes education to Chinese patients, further evidence is required on cultural tailoring strategies to effectively promote behaviour change. Therefore, to supplement this meta-analysis, a qualitative exploratory case study has been undertaken.

## CHAPTER FOUR: QUALITATIVE CASE STUDY

足行萬里路，勝讀萬卷書

Travel ten thousand miles and experience the world rather than seeing the  
world by reading ten thousand books.



## Preamble

This chapter describes the qualitative case study. It first outlines the methodological framework underpinning the qualitative research undertaken, including an overview of the strategies of inquiry; the varied data collection and analytical techniques used; and the strategies put in place to enhance research rigour. It also provides study results, including description of cases, and presents two publications (one published and one accepted for publication) and a paper submitted for consideration. Finally it ends with a conclusion of this qualitative case study.

## A qualitative case study

A qualitative exploratory study was conducted to study how diabetes education is delivered to Chinese patients in various clinical settings and to capture details on how diabetes education is culturally tailored by health professionals across different cities in Asia and Australia. This study was designed to answer the following research question:

- How do Chinese patients and facilitating-health professionals behave during diabetes education sessions?
- How can diabetes education be culturally tailored to meet the unique needs and expectations of Chinese patients?
- How does experience including migration impact on the diabetes journey experienced by Chinese Australian patients?

## Ethical Approval

- This study has been approved by the Monash University Human Research Ethics Committee (Project Code CF12/1186 – 2012000582) – see Appendix for the approval letter and copies of permission letters from host-organisations at various field sites.

## Methodological framework

The research described in this study was designed to gather in-depth information on the behaviour of Chinese patients' with diabetes exposed to education about this condition. It also aimed to explore the diversity of culturally tailored strategies of existing diabetes education programs targeted at Chinese patients. A qualitative case study approach using ethnographic methods was employed, to allow an open-ended exploration of issues and to gain understanding of patient behaviour. The researcher collected multiple data sources through cases from four Asian and three Australian cities using participant-observation and qualitative interviews. This section describes a detailed methodological framework that shaped the research, and each of the papers includes a summarised method.

### Strategies of inquiry

#### *Case study research approach as the main strategy of inquiry*

Case study is a holistic and in-depth exploratory methodology for investigation of casual relationships between a phenomenon and the context in the environment where it occurs, taken from the perspective of those involved (Merriam, 1988; Stake, 1995; Yin, 2009). It is a frequently used approach in social science and health care research for studying people and programs (Creswell, 2007; Stake, 1995; Yin, 2009). An important advantage of this research strategy is that it facilitates the collection of data from multiple sources within the bounded case which provides a rich and detailed understanding of reality in its context (Amaratunga & Baldry, 2001). The integration and comparison of different perspectives builds a rich and detailed understanding of each case. Like other forms of qualitative research methods, case study research has an exploratory nature, but this approach is also uniquely 'bounded' in the studied case by time, space, place and context, allowing collection of location-, time- and cultural-specific information to address the research question (David, 2006; Smeijsters & Aasgaard, 2005; Stake, 1995). The application of this strategy of inquiry in this present study allowed the researcher to gain deep insights of the complex reality of diabetes education services in several Asian countries and Australian cities in a bounded, but natural non-experimental environment, while uniquely exploring the influences of Chinese sub-cultural values from each city on diabetes education.

An *instrumental* (Stake, 1995) *multiple-case* study design (Yin, 2009) was adopted in this study, where the phenomenon of Chinese diabetes education was explored in geographically diverse cities, and each city became a case bounded by location and its data collection period. This multiple-case design was made more compelling by combining and appraising evidence collected from different settings and contexts, contributing to a study that is robust (Herriott & Firestone, 1983). Rich data were collected by gaining a deeper understanding of the diverse Chinese sub-cultural communities, as well as identifying health practices tailored to Chinese culture and unique population-specific strategies in diabetes education. Therefore, qualitative data was obtained to help understand existing diabetes education practices developed for Chinese with relevance to the local diabetes care service in Australia.

The pre-determined theoretical boundaries and pre-designed study protocol allowed a confirmatory approach to data collection (Gray, 2009a). This was to avoid narrowing of focus between cases, so that the researcher remained open to new information. Within- and cross- case analysis was undertaken at the end of all cases to note replications (Yin, 2009) and to gain insight by eliciting meanings from the observed phenomenon.

Within the boundaries of the case study research, the present study also took a naturalistic approach to learning about people's behaviours, lives and cultures. This is largely informed by ethnography. The essence of ethnography is '*to understand another way of life from the native point of view*' (Spradley, 1979). The primary data collection process included long-term immersion in the field where the data collection occurred, allowing the researcher to interact, share stories and meals with the informants, participate in activities and experience what the informants experienced. The ethnographic approach helped the researcher to understand the Chinese patients' behaviour and to explore their cultural beliefs from their own perspective. Many ethnographers have also highlighted that fieldwork in qualitative research is grounded in the relationship the researcher has built and kept with those researched (Bernard, 1988; Erickson, 1986; Glesne, 1989; Glesne & Peshkin, 1992). Thus, the researcher purposefully spent time 'hanging out' in the field as recommended by Brayboy and Deyhle (2000) in order to build rapport with study informants. The process of building rapport was considered to be particularly important for this present study as Chinese people have a strong other-oriented self-concept and their social behaviour varies markedly for insiders versus outsiders (Gao, 1998). This participation and involvement in activities with the researched was carefully balanced with periods of objective observation and collection of relevant truthful data to answer the research question. The two seemingly contradictory activities, participating and observing, occurred simultaneously (Marvasti, 2004) and the researcher switched between the dual positions of 'insider/outsider'. As suggested by Hammersley and Atkinson (Hammersley & Atkinson, 1996), the researcher took a 'marginal position' being neither a 'complete outsider' nor a 'complete insider' to allow space for 'intellectual distance', thus creating an analytic space for objective analysis of the observation. Studying and researching the cases from both the 'inside' or 'outside' provided an in-depth, rounded understanding of the studied phenomenon.

#### *Philosophical underpinnings of research approach*

The overall methodological framework was also underpinned by various philosophical assumptions that reflect the beliefs, values and assumptions about the nature of human beings that were made by the researcher. These philosophical assumptions include a view toward the nature of reality (*ontology*), the relationship between the researcher and that being researched (*epistemology*), the role of values in research (*axiology*), the language of research (*rhetoric*) and the process of research (*methodology*) (Creswell, 2007). These assumptions, shown in Table 9, shaped the orientation and design of the present study and guided the inductive meaning-making process.

Table 9: Philosophical assumptions and implications for the present study (adopted from Creswell, 2007)

Assumptions	Characteristics(Creswell, 2007)	Implications for this study
<b>Ontological</b>	Reality is subjective and multiple, as experienced by studied participants	Direct quotes were captured in taped interviews and during observations as evidence of different perspectives
<b>Epistemological</b>	Researcher attempts to lessen distance between self and those being researched	The researcher spent time in the field before, during and after data collection to build strong rapport with all study participants
<b>Axiological</b>	Researcher acknowledges that research is value-laden and that some biases are inevitably present	A reflective log was kept to capture personal values and thoughts that shaped the interpretation of data during collection and analysis
<b>Rhetorical</b>	Researcher writes in a literary, informal style using the personal voice and uses qualitative terms and limited definitions	In the reflective log, the researcher used the first-person pronoun to capture her first-hand experience in an immediate context
<b>Methodological</b>	Researcher uses inductive logic, studies the topic within its context, and identifies an emerging design	The study followed a systematic but open-ended approach to allow theory to emerge from the collected data, influenced by the researcher's experience and cultural understanding

### *Sampling of cases and recruitment*

As Punch (2005) described, a case is difficult to define, as almost anything can be a case: a person, a role, an organisation, a community or a country. In this present research study, the unit of analysis was bounded by its geographic location, i.e., a city. Each case was chosen for specific theoretical reasons. Firstly, in order to capture the variety of culturally tailored practices in diabetes education in different countries or cities, the first level of case selection was chosen according to the countries of origin of the Australian Chinese (Migrant Information Centre (Eastern Melbourne), 2010). It was considered important to gain an understanding of the Chinese sub-cultural communities and the environment and healthcare systems that Chinese migrants had been exposed to prior to their immigration to Australia. The researcher hypothesised that this previous experience particularly in relation to healthcare and/or access to diabetes care would impact on their expectation of the health service in Australia. Accordingly, diabetes education programs targeted at Chinese population in these countries of origin were identified and facilitators of these programs were contacted. Similar selection strategies were then employed in Australia to identify diabetes education programs focussed on Chinese with diabetes across the states in Australia. Secondly, to enhance richness of data, care was

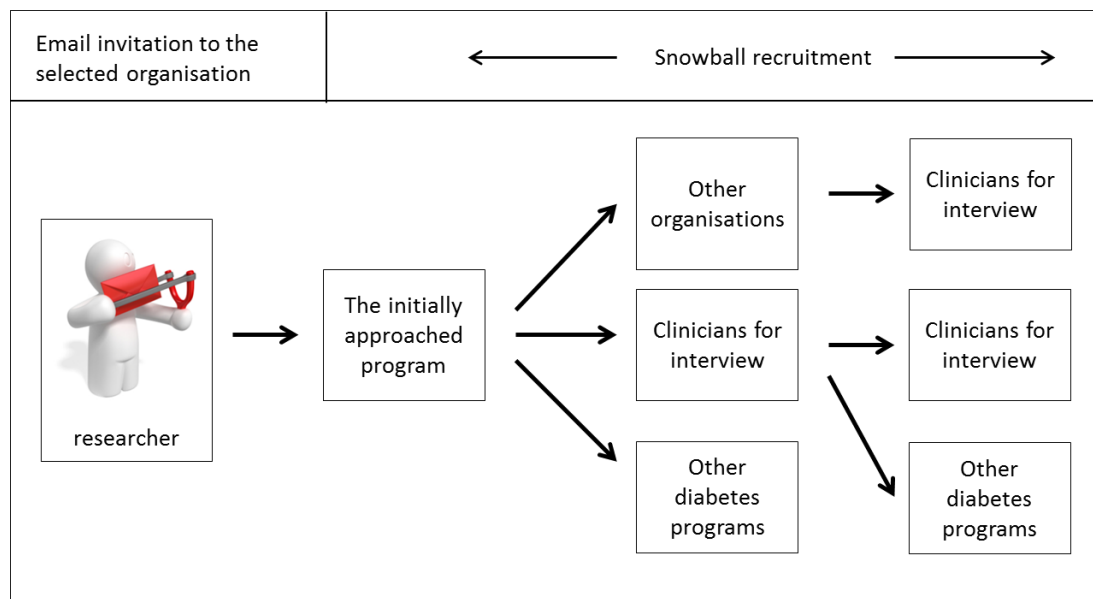
taken to include a diversity of diabetes education delivery methods. The full list of selection criteria used in choosing a case is listed in Table 10.

Table 10: Selection criteria of studied cases

<b>Selection criteria for case</b>
<b>First level of selection</b>
Geographic locations: China (Northern and Southern), Hong Kong, South-East Asia (Singapore), all Australian cities
<b>Second level of selection</b>
Program targeted at a local Chinese population with type 2 diabetes
Program delivered in Mandarin, Cantonese, or English
Contactable program facilitator
Different delivery method from any other selected program
Preferred criterion: delivered by health professional(s)

After each appropriate case had been identified, the researcher invited participation via email or letter in Chinese. Permission was gained with the organisation to conduct participant-observation of the diabetes education program and in-depth interviews with program facilitators. Upon the researcher entering the case study site, a snowball recruitment technique (Sadler, Lee, Seung-Hwan Lim, & Fullerton, 2010) was also used to further invite other health professionals with relevant experience in diabetes education to participate in an interview and when possible, to organise observation of clinical services other than the initially-approached program. Figure 5 provides a pictorial illustration of the recruitment process. This technique was reported as the most effective in contacting the hidden and hard-to-reach groups and organisations (Streeton, Cooke, & Campbell, 2004), especially overseas, where programs were often not promoted online and often Chinese health professionals had not responded to email invitations.

Figure 5: An illustration of the recruitment process



### *The researcher in the research*

As in all qualitative research, the researcher becomes the principal data collection instrument (Humphreys, Brown, & Hatch, 2003). In the present research, this was particularly appropriate as the researcher is of Chinese background with an experience and a history of living in Hong Kong and Singapore, and connections in China. This experience gave the researcher some understanding of overseas health systems, as well as through personal and professional networks, enabling an easy entry to the researched communities. The Chinese cultural identity of the researcher helped to establish a strong researcher-informant relationship and feeling of trust, which should allow the emergence of better quality data that is more honest and reliable (Leininger, 1985). As an Australian-trained dietitian who delivers diabetes education to Chinese Melbournians, the researcher was well-respected by the Chinese community, and was able to utilise this role to gather patient diabetes management stories in Melbourne. However, the shared cultural background could impact on the researcher potentially missing details during observation due to cultural assumptions. To explicitly capture and acknowledge the impact of the researcher's views and values, the researcher practiced reflexivity by keeping a reflective log (Bradbury-Jones, 2007) completed after each fieldwork experience. In the reflective log, the researcher recorded personal opinions, her impression of participants and observed phenomenon, learning, consolidation of pre-existing knowledge, as well as the researcher's potential influence on the data collected. The reflection log was then reviewed by second researcher (CP) who is non-Chinese, to elicit meaning and make sense of the observation.

### *Development of the case study protocol*

A case study protocol (Appendix) was prepared prior to data collection in the field. Although all data were collected by the same researcher which helped to reduce variation in research practice, the protocol contained procedures and general rules that guided the fieldwork across various research sites. Yin (Yin, 2009) suggests the protocol is an important way of '*increasing the reliability of case study research*' (p.79) and is ultimately essential when conducting a multiple-case study. With the unstructured nature of qualitative research, the protocol was helpful in keeping the researcher on task and focused on the collection of relevant data to answer the research questions. The protocol developed for the present study consisted of an overview of the research, field procedures, case study questions and a guide for the case study report.

The case study protocol also included a clearly stated theoretical proposition and research questions synthesised from existing literature, prior to start of this study. The theoretical proposition later became an important tool during data analysis.

### *Data collection methods*

In this research study, data was collected from multiple sources using several methods, including participant-observation and qualitative interview. As Yin had suggested, the use of multiple sources of evidence is a way to ensure *construct validity* (Yin, 2009) to give the fullest picture possible of each studied case.

### *Qualitative participant-observation*

Qualitative observation is a systematic and purposeful research method and involves 'going into the field', watching, recording and analysing what people do and say (Mays & Pope, 1995). Alder and Alder have described this research method as:

*...fundamentally naturalistic in essence; it occurs in the natural context of occurrence, among the actors who would naturally be participating in the interaction, and follows the natural stream of everyday life (Adler & Adler, 1988, p.378)*

The major advantages include allowing the observing researcher to become immersed in the group culture (Mays & Pope, 1995) and to witness behaviour connections, correlations and causes unfold in the complexity of the natural environment (Adler & Adler, 1988). Hence, it helps to reduce the discrepancy between what people say and what they actually do, and captures behaviours or routines that participants themselves may not be aware of (Draper & Swift, 2011; Mays & Pope, 1995). Applying the qualitative observation research method in this study specifically helped uncover some of the cultural modifications made to diabetes education targeted at the Chinese populations in different

case sites, which may have been applied as second nature by practitioners after years of clinical practice. Many Chinese health professionals may be concerned about 'losing face' (Ho, 1976) and might be reluctant to openly share details on program implementation barriers and participants' behaviours that might have impacted on delivery of diabetes education. For this, using qualitative observation methods, the researcher was able to capture what was being done and what was not, without seeking the information second-hand from interviewed health professionals.

Although an obvious drawback of this research method is that the presence of the researcher could stimulate participants to modify their behaviours (Mays & Pope, 1995), the researcher tried to overcome this by spending more time on the field, prior to data collection, in order for participants to become accustomed to her presence (Creswell, 2007).

The degree of participation during observation has been described by Spradley as a continuum (Spradley, 1980), between an inevitable emotional involvement with the studied community and the pronounced level of detachment necessary for scientific objectivity. Gold (Gold, 1958) has outlined four possible modes of interaction during data collection: the *complete participant*, the *participant-as-observer*, the *observer-as-participant* and the *complete observer*. The *complete observer* remains strongly research-orientated and maintains his/her emotional distance from the observed, whereas the *complete participant* role allows the researcher to 'become the phenomenon' and become immersed in the culture in order to capture the full in-depth experience (Adler & Adler, 1988). Although being a *complete participant* allows a deeper emotional understanding, it is important for the researcher to 'seek to understand the native's viewpoint but not go native' (DeWalt & DeWalt, 1998). In this study, the researcher purposefully took on varied modes of observer to adequately balance the researching position and collect objective data during immersion in the culture.

Although data collection via observation was naturalistic and opportunistic, the observations in this study followed a systematic approach and progressed in stages as described by Dewalt and Dewalt, (1998). The initial observation was primarily descriptive, unfocused and general. When the researcher became more familiar with the setting and gained understanding of the culture of the observed, the researcher then proceeded on to a more focused observation, directing attention to the interested phenomenon to answer the research questions. The last stage was 'selected observation', where the researcher became more selective as to which elements were captured as data for theory conceptualisation.

As with other case study research, the progress of observation was not distinct, and constantly moved backward and forward from initial observation, focused observation to selected observation. At the point of entry into a new observation field, the researcher began with initial observation to gain a



general understanding of the culture, the healthcare and diabetes care system of the country or of different Australian states. Then the researcher focused attention to building on constructing theory.

#### *Data collection tools during observations*

During *participant-observation*, data is usually collected in a relatively unstructured manner in naturalistic settings (DeWalt & DeWalt, 1998). Previous case study researchers had tried using a self-developed data collection sheet to direct their attention to fine details of the observed phenomenon (Humphreys, 1975). In this study, a set of data collection worksheets was developed for use during observation. The set included an observation checklist to compare the studied program against the current Australian best practice guidelines for type 2 diabetes education (Colagiuri, Girgis, Elgenmann, Gomez, & Griffiths, 2009) (Appendix). The second tool was a template used at observation to collect details of participants, facilitators, resources used, program setting and environment, as well as the theoretical model that influenced the design of program (Appendix). This template assisted with structured data collection during the observation, which then was translated into detailed field notes immediately after the observation.

#### *Field notes with reflection*

Field notes have a central place in observational studies (Mulhall, 2003) and are the primary data collection method in *participant-observation* (DeWalt & DeWalt, 1998). Dewalt and Dewalt have even argued that writing down what is observed is the only way to record any observation, so that observations cannot become data without the field notes. Field notes generally include descriptions of the observed interactions and the context in which they occurred (Roper & Shapira, 2000), while the researcher participated in the active process of sense-making of own feelings and interpretations of the observed phenomenon (Angrosino, 2007). The selective data captured, however, can be significantly affected by the professional and personal worldview of the researcher (Mulhall, 2003). To address this, the researcher engaged in self-reflection by keeping a reflective journal to explicitly capture her thoughts and the personal perspectives generated from each observation. This detached reflection acknowledged the researcher's own input into the interpretive research (Johnson & Waterfield, 2004) and formed a key stage in the development of the present study (Gillham, 2000). Through critical reflection, the researcher made personal experience as an 'insider' transparent which was able to be transformed into accountable knowledge (Coffey & Atkinson, 1996).

## Interviewing

The second data collection method was the interviewing of health professionals involved in diabetes care. This was designed to obtain rich information from an alternative data source, supplementing and triangulating the observational data and enhancing construct validity of the findings (Yin, 2009).

Interviewing is a widely-used research method to access people's experience and explore their perceptions, attitudes, feelings and understanding of reality (Arksey & Knight, 1999). Holstein and Gubrium (2003) have suggested that interviewing is an approach for collection of empirical data about the social perspectives of individuals by inviting them to talk about their experience in great depth. Although interviewing is useful in collecting phenomenological data not captured by observation, it has the limitation that the interviewee is potentially filtering information, and that not all people are equally articulate and perceptive (Tellis, 1997).

Based on their degree of structuring, interviews can be categorised into five groups: *structured* interviews, *semi-structured* interviews, *non-directive* interviews, *focus* interviews and *informal conversational* interviews (Gray, 2009b). In the present research, a mixture of interview approaches was taken. A summary of the different interview approaches, their characteristics and the applications in this present study is provided in Table 11.

Table 11: Interview approaches and applications used in this study (adopted from Gray, 2009b)

Interview approaches	Characteristics (Gray, 2009b)	Applications in this study
Semi-structured interviews / in-depth interviews	Interviewer uses open-ended questions during conversation followed by probing questions, data collected is usually used for qualitative analysis.	This method was used at interviews with the health professionals who were involved in the diabetes programs observed.
Non-directive interviews	Interview is used to explore a topic in order to answer research questions but there are no pre-planned questions.	This method was used during interviews with dietitians and diabetes educators (who were not involved in the observed program).
Informal conversational interviews	Interview relies on the spontaneous generation of questions as the interview progresses, flexible to whatever path the interview takes.	The informal conversational interview method was used at unplanned opportunistic interviews with patients during observations.

The interviews were designed to capture the experience and perception of the observed program from facilitators and patients. The open-ended questions were used to elicit discussion of experience of conducting and receiving diabetes education, respectively. The interview participants were the diabetes program facilitators (in the semi-structured interviews) and patients participating in the program (in the informal conversational interviews). Meanwhile, via snowball recruitment, other health professionals working with the Chinese patient community were also recruited to participate in non-directive interviews to explore their experiences as clinician educators. Face-to-face interviews were conducted whenever possible. Phone interviews were conducted for the Beijing and Perth case studies due to logistics and financial resource constraints.

The interview questions used at the semi-structured interviews were developed around two domains of inquiry: (i) the interviewee's involvement in, and (ii) the interviewee's perceptions of, the observed diabetes program. The interview questions and inquiry logic are provided in Table 12.

Table 12: In-depth interview questions and inquiry logic

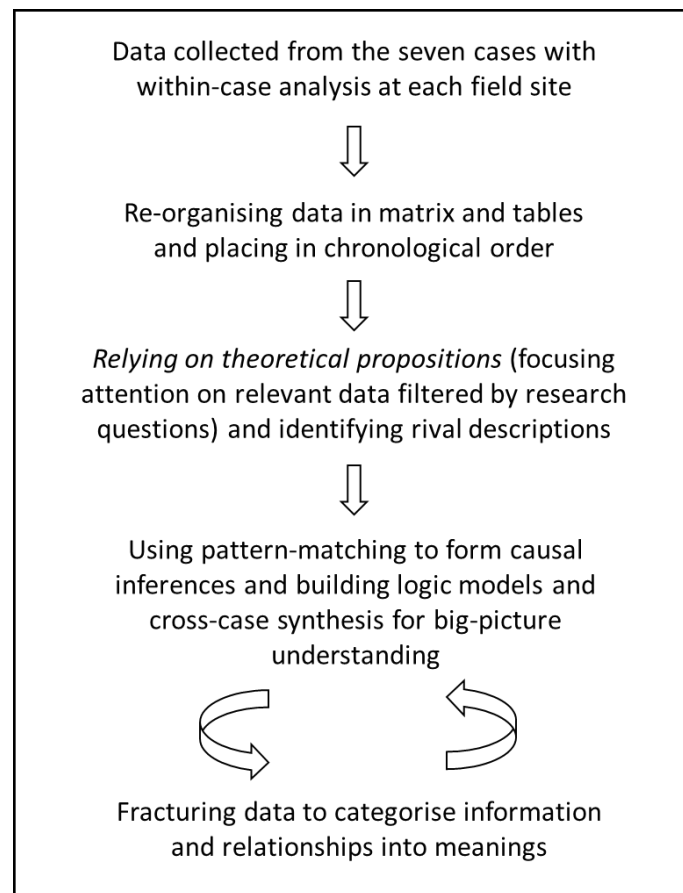
Question	Inquiry logic
What is your usual occupation?	To explore facilitator's clinical qualifications and background
How did you get involved in this program?	To understand the history of facilitator's involvement in the observed program
Can you tell me about your experience / feelings in running the program?	To validate facilitator's skills in delivering the observed program
Beside program delivery, how else are you involved in the program?	To gain an understanding of the facilitator's involvement and contribution to the various stages of the observed program
What do you think are the strengths and areas requiring further development of the program?	To identify the perceived strengths and weaknesses of the observed program
How would other health professionals elsewhere describe your program?	To explore the reputation of the observed program
Have you heard any anecdotal comments from participants about the program / part of the program?	To understand participants' satisfaction of the observed program
What impact/outcome do you think the program plays in the overall management of type 2 diabetes?	To assess the perceived impact of the observed program
What do you think are the main contributing factors for the success of your program?	To identify the enablers of the observed program
If you can modify the program, what would you suggest?	To identify the barriers of the observed program
If you are to give me one piece of advice on designing an effective diabetes education program for the Chinese community, what would it be?	To summarise facilitator's experience in delivering diabetes education to the Chinese patients and to identify what they believe is the most effective approach for diabetes education based on their experience

The interviews were conducted in Cantonese, Mandarin or English. Interviews were audio-taped when possible, but audio-recording was deemed culturally inappropriate at some research sites. The recorded interviews were transcribed verbatim for analysis. Two Chinese interview scripts were selected at random to be translated into English for triangulation by a non-Chinese researcher (the researcher's main supervisor). For those interviews conducted without audio-recording, the researcher took extensive notes during the interviews which were then translated into English field-notes immediately after the interview. The accuracy of the translation was checked by a Chinese independent research dietitian (JHL). See Appendix for certification.

#### Data analysis methods

As Miles and Huberman (1994) strongly recommend, the data analysis process for this present study began during data collection, allowing the researcher to 'move back and forth between thinking about the existing data and generating strategies for collecting new'. As mentioned earlier, this study took a deductive approach without extensive narrowing down data collection focus from case to case; however, the within-case analysis began at each field site. The within-case analysis involved documenting descriptions which, as Gersick (1988) and Pettigrew (1988) have noted, can be central to the generation of insights. The practice of reflexivity on each field-note entry further captured the researcher's contribution into the interpretive process (Johnson & Waterfield, 2004) and consolidated insight-building. This process allowed preliminary identification of patterns and emergent understandings, and the purposeful testing of these patterns during subsequent data collection within the same case. The aim was to become intimately familiar with each case as a stand-alone story, allowing the unique patterns to emerge from each case before undertaking generalised pattern-identification across cases (Amaratunga & Baldry, 2001). Figure 6 illustrates the systematic data analysis process.

Figure 6: Pictorial illustration of the systematic data analysis process



### *The data analysis process*

Building onto the within-case analysis, the gathered data was also systematically examined and interpreted to elicit meanings, using data analysis methods for case study research (Stake, 1995; Yin, 2009). It first began with analytical manipulations, including: sorting information into different groups; making a matrix of categories and placing the collected information within such categories; creating data displays for examining the data; creating a table to capture frequency of different events; examining the complexity of tabulations and their relationships; and placing information in chronological order (Miles & Huberman, 1994). Such data management can be a useful preliminary step for analysis and is important for putting collected evidence in some order (Yin, 2009). Second, the data was analysed using two of four general analytical strategies: *Relying on theoretical propositions* and *Examining rival explanations* (Yin, 2009). These allowed original theoretical orientation to guide the analysis process and answer pre-defined research questions. By doing this, it helped to focus attention on the most relevant data filtering out irrelevant information. Meanwhile, data with rival descriptions to the initial proposed theoretical propositions were highlighted in the process (Yin, 2009). These rival descriptions provided contrasting perspectives for comparison and an

understanding of the 'other influences' on the observed phenomenon. Finally, data were examined with three other analytical techniques: *pattern matching*, *logic models* and *cross-case synthesis* (Yin, 2009).

*Pattern matching*, which has also been called *replication logic* by Eisenhart (Eisenhardt, 1989), is one of the most desired techniques for use in case study analysis (Yin, 2009). Trochim (Trochim, 1989) has described this technique as comparing 'an empirically based pattern with a predicted one', and it helps strengthen internal validity (Yin, 2009). The logic behind pattern matching is that the patterns emerge from the collected data which either match (or fail to match) the originally expected pattern. Both non-equivalent dependent variables and rival explanations become the patterns identified, forming strong causal inferences (Yin, 2009). With repeated comparison, the patterns became more valid whenever theoretical replication across the cases is found. In this present study, the researcher also applied thematic analysis technique at this stage of analysis to introduce more structure. This commenced with a coding process known as 'fracturing the data' (Glaser & Strauss, 1967) and identification of patterns by labelling chunks of data with an initial interpretation of meanings (Corbin & Strauss, 2008; Gibbs, 2007; Holton, 2007). These codes were then grouped into categories and further condensed into descriptive multi-dimensional themes.

In addition to the *pattern matching* technique, *logic models* and *cross-case synthesis* techniques helped to arrange a complex chain of events in chronological order, inter-relating the data from a bigger picture for causal patterns (Yin, 2009). The use of *logic models* is also described as a form of pattern matching by comparing the observed events with theoretically predicted ones (Yin, 2009). It involves examination of the sequential stages of the events, identifying cause-effect patterns. In this study, *logic models* were helpful in exploring the relationship between the Chinese patients' collective behaviour and the cultural tailoring strategies used by the Asian health professionals. Lastly, the final technique, *cross-case synthesis*, was applied to draw cross-case conclusions from across the multiple cases (Yin, 2009). Key findings from across the cases were put into a table and interpreted by comparing and contrasting the findings between the cases. This helped to build a strong argumentative interpretation of the gathered data, forming distinct highly insightful cultural-, location- and context-bound conclusions supported by a range of data. The data analysis process was conducted by two researchers (TC and CP) separately then findings were compared and discussed.

### *Theoretical Memos*

To manage the large volume of data, the researcher employed memo-writing to '*catch thoughts, capture the comparisons and connections, and make crystallise questions and directions for further pursuing*' (Charmaz, 2006). This strategy helped the researcher to become more actively engaged in the data analysis process and increased the level of abstraction of the developed ideas (Charmaz, 2006). It was also a useful way to keep track of the audit trail of the procedure undertaken in the study (Birks & Mills, 2011), while highlighting the meaningful connections between personal viewpoints and the intellectual operation of coding (Lofland & Lofland, 1995). The systematic active process of analysing the memos helped to develop insight into the ongoing work and to conceptualise meaningful conclusions.

### *Use of computer-assisted software*

The software package QSR-Nvivo 10 (V10.0.138.0 (64bit), QSR, Australia) was used to facilitate data analysis. The software package also assisted the researcher to present the analytical process in a logical manner, enabling a clear transparent view during analysis.

### *Establishing trustworthiness and enhancing rigour*

To establish the credibility of the case study evidence, previous case study researchers (Lauckner, Paterson, & Krupa, 2012; Morse, Barrett, Mayan, Olson, & Spiers, 2002; Yin, 2009) have suggested a range of tactics for various tests of rigour. These included strategies to ensure the completeness, reliability, construct validity, internal validity, external validity, transferability and credibility of the collected data. To ensure the findings of this study accurately described and captured the phenomenon studied a range of strategies were used (Table 13) to establish trustworthiness and enhance rigour.

Table 13: Methods used to enhancing rigour and their application to this study (adopted from Yin, 2009, Lauckner et al., 2012 and Morse et al., 2002).

Tests	Case study tactics	Applications to this present study
Completeness	Prolonged engagement in the field to ensure extensive data collection Data saturation	The researcher spent up to four weeks at field sites, and became immersed in the local culture, collecting data until theoretical saturation was achieved.
Reliability	Uses a case study protocol Develops a case study database Maintains a chain of evidence	The case study protocol developed prior to the field trips were used across all cases to ensure consistency in approach. All data were stored centrally as Nvivo files. This data management system provides a traceable evidentiary process as to how the conclusions were made from collected data.
Construct validity	Uses multiple sources of evidence Uses member checking Investigator triangulation	Data were collected from participant-observations, qualitative interviews and document analysis. These data were then triangulated across sources and cases. Two randomly selected interview scripts were checked by the interviewees to ensure accuracy in transcription. Data were separately coded by two researchers (TC & CP) and discussed until commonly agreed themes emerged.
Internal validity	Undertakes pattern matching Uses rival explanations Uses logic models	Pattern matching was employed as a primary analytical strategy. Rival explanations were investigated throughout data collection and included in the analysis to provide more robust conclusions. Data were analysed using the <i>logic models</i> technique to explore the casual relationships of events and observed behaviours.
External validity	Uses replication logic	To ensure the findings of this present study are applicable to populations outside the studied participants, replication logic was used in the research design by including multiple case studies to ensure the data were gathered from and replicated in diverse populations.
Transferability	Uses thick description	A detailed description of the observed events and interactions was completed for each observation. This allows naturalistic generalisations (Stake, 1995). Cases were selected from various Asian countries and Australian cities to ensure representativeness of the findings.
Credibility	Reflexivity of the researcher	The researcher kept a reflective journal during data collection to capture thoughts and emerging interpretations. This journal was also reviewed by second researcher (CP) to further establish credibility.



## Description of cases

### *Overview*

The data collection was completed in seven cities across three countries: Australia, China and Singapore. Each case was bounded by its geographic location and time spent by the researcher at the different field sites. This section provides descriptive information regarding the seven case studies conducted in this research, entailing the location of each case, time spent in the field, organisations engaged, diabetes programs observed, health professionals interviewed and details of data collection methods employed.

### *Descriptive data of the seven cases studied*

The selection of cases studied was directed by pre-designed selection criteria. The four international cases chosen were China (Beijing), China (Guangzhou), Hong Kong and Singapore, while the three Australian cases were Melbourne, Sydney and Perth. A total of seven case studies were included in this research. The description of each case below is listed in chronological order of data collection.

### *Detailed description of each case*

#### *Singapore*

Data collection in Singapore was undertaken over four weeks in August 2012. The researcher engaged with various community organisations and government-funded health services including hospitals and polyclinics for participant-observations, and interviewed the facilitators of a diabetes education program as well as diabetes dietitians at major public hospitals.

#### *Guangzhou*

The researcher visited Guangzhou, China, in November 2012 for four weeks, and was mainly involved in observing an in-patient diabetes education program attached to a public hospital. The researcher also took the opportunity to deliver a community-initiated diabetes awareness lecture, targeted at the general public. In order to gain a better understanding of the diabetes care system, the local government official who was in charge of managing community health centres was recruited for interview.

#### *Sydney*

In March 2013, the researcher attended a three-session Chinese diabetes education workshop in Sydney, run in a public library, targeted at people with and without diabetes. The researcher visited Sydney on three separate days for the participant-observation. Interviews were conducted with the health professionals and organisers of the observed diabetes education workshop.

### *Hong Kong*

Data collection in Hong Kong was completed in May 2013 over four weeks. The organisations involved were in diverse settings, including a community patient-initiated organisation, a public hospital and some privately funded community health organisations, where individual and group diabetes education sessions were observed. Interviews were also conducted with health professionals including dietitians and nurses in major hospitals and diabetes centres.

### *Perth*

In July 2013, the researcher conducted a phone interview with a Chinese bilingual facilitator who ran a regular grocery-shopping tour and cooking class for Chinese migrants with type 2 diabetes. The shopping tour and cooking class were single-session group programs with translated content and promoted alongside with the mainstream diabetes programs on the website.

### *Beijing*

For the Beijing case study, the researcher interviewed the two primary project officers of a community diabetes education project in August 2013. This community diabetes education project involved applying the Australian model of health coaching in diabetes education to a group of Chinese patients in Beijing. The interviewed officers were involved in training the Chinese health professionals in Beijing, and evaluating the impact of the program.

### *Melbourne*

The researcher collected observation data during her clinical dietetic practice at a community health service during the period of February to October 2013. The researcher also observed delivery of a diabetes awareness session delivered by a Chinese health educator and a translated Chinese diabetes support group. Additionally, in-depth interviews were conducted with health professionals including dietitians, diabetes nurse educators and an endocrinologist who provided a diabetes education service to Chinese Australian patients.

### *The data collection methods employed*

Data were collected from multiple information sources via participant-observations and interviews, as described above. Table 14 summarises the data collection methods used for the respective case studies.

Table 14: Data collection methods used for respective case studies

Case study	Data collection methods used
Singapore	Participant-observation, interviews
Guangzhou	Participant-observation, interviews
Hong Kong	Participant-observation, interviews
Beijing	Interviews
Melbourne	Participant-observation, interviews
Sydney	Participant-observation, interviews
Perth	Interviews

#### Qualitative participant-observation

Qualitative participant-observation was the primary data collection method used in this research. This method was used in five of the seven case studies, to explore and understand participants' behaviours in the natural environment.

While using this method of data collection, the researcher purposefully varied her observer role to employ different degrees of participation: immersion in the culture permitted deep understanding, while maintaining some distance from participants allowed a necessary level of scientific objectivity. The observer mode employed for each data collection activity is listed in Table 15.

Table 15: The mode of observer for each data collection activity

Data collection activity	Mode of observer
<b>Singapore</b>	
Observation of various diabetes education programs	Complete observer
<b>Guangzhou</b>	
Observation of in-patient diabetes education programs	Complete observer
Delivery of community-initiated diabetes awareness lecture	Complete participant
<b>Sydney</b>	
Observation of Chinese diabetes workshop	Observer-as-participant
<b>Hong Kong</b>	
Observation of various diabetes education programs	Complete observer
<b>Melbourne</b>	
Observation of diabetes awareness session	Observer-as-participant
Observation of diabetes support group	Complete observer
Individual dietetic consultation with Chinese patients with type 2 diabetes	Complete participant

Table 16 provides the details of each observation at various field sites, including the target population, location of the diabetes education, language it was delivered in, format, group size, facilitators, education approach and drivers for the education approach adopted. These details of the observed diabetes education session were thought to influence participants' behaviours at the session, impacting the variety of data collected.

In summary, with purposive sampling, the observed diabetes education sessions varied in delivery formats and group size, ranging from individual consultations in the Melbourne case study and within the Hong Kong case study, small-group discussion (group size of four), to large group lectures (group size of 110). The variety of delivery included multiple-session programs, single-session programs to existing group, lectures to general community members, etc., with employment of diverse education approach as determined by logistical reasons and facilitators' experience. The diversity in delivery enhanced the richness of the findings.

Table 16: A summary of all participant-observations

	Group	Target population, location	Language	Format	Observed	Researcher's role	Group size	Facilitated by	Education approach*	Drivers for the education approach
SINGAPORE	Chinese diabetes workshop	Patients in community, community organisation	Mandarin	4x 2.5-hour weekly group session	All sessions	Observer	9	Nurse (mainly) + exercise physiologist at one session	Intensive short-duration education	Inexperienced facilitator, lecture-style seating, facilitator's belief in learning
	Diabetes education class	Patients accessing community outpatient clinic	English	Single 2-hour group session	One session	Observer	5	Nurse & dietitian	Peer-learning approach + Education focused on diet	Facilitator trying new method of service delivery
	Health promotion workshop for seniors	Community members, community centre	Mandarin	3x 1-hour weekly group session	Final session of the three sessions	Observer	7	Nurse	Intensive short duration education	Low literacy group, facilitator's belief in experiential learning
	Diabetes walking group	Patients in community, local park	Mandarin, English	Monthly 2-hour session	One session	Observer & participant	10	Nurse	Experiential learning approach – to observe impact of exercise on blood glucose levels	Facilitators' belief in experiential learning
GUANGZHOU	Diabetes education series	Inpatients, hospital	Mandarin	5x Twice-weekly 1-hour session	All sessions	Observer	9-26	Nurse	Intensive short-duration education	Regular education class for inpatients – format not changed for years
	International diabetes day event	Patient in hospital & community, hospital	Mandarin	Single 1.5-hour group session	One session	Observer	65	Endocrinologist (to introduce importance of self-care) & nurses	Lecture & quiz (with gift)	Large audience, annual event designed to refresh patients' knowledge & make it fun
	Diabetes awareness talk	Community members, community hall	Mandarin	Single 2-hour group session	One session	Educator	110	Dietitian	Lecture	Large audience
SYDNEY	Diabetes education workshop	Community members (mostly patients), public library	Mandarin	3x fortnightly session	All sessions	Observer	15-20	Multidisciplinary team (nurse, dietitian, podiatrist, volunteer leading exercise)	Intensive short duration education	Asian but non-Chinese health professionals, Australian-model of diabetes education

HONG KONG	Workshop on food exchange calculation for diabetes management	Patients in community, community organisation	Cantonese	2x 2-hour weekly sessions	All sessions	Observer	10	Patient-educator	Calculating treatment plan	Participants close relationship with facilitator
	Annual diabetes 1-day camp	Patients in community, school hall	Cantonese	Full-day group activities	One day	Observer	40	Patient-educator	Lectures + Experiential learning approach (exercise, lunch)	Annual event, participants close relationship with facilitator
	Diabetes complication screening session	Patients in community	Cantonese	Individual screening & education	One session	Observer	1	Nurse	Individual education	Attempts to individualised lifestyle modification recommendations
	Diabetes education session	Outpatients, hospital	Cantonese	3-hour single group session	One session	Observer	40	Nurse	Lecture	Large audience in a very packed room
	Cooking class for people with diabetes	Patients in community, community organisation	Cantonese	Single group session	The session	Observer	4	Nurse & nutritionist	Experiential learning approach	The nature of cooking class
	Diabetes complication screening session	Patients in community, hospital	Cantonese	Individual screening & education	One session	Observer	1	Nurse	Individual education	Attempts to individualised lifestyle modification recommendations
	Traditional Chinese Medicine public lecture on diabetes management	Patients in community, community organisation	Cantonese Mandarin	Single session lecture	One session	Observer	100	Chinese medicine practitioner	Lecture	Large audience

MELBOURNE	Translated Chinese diabetes support group	Community members, community hall	English translated into Mandarin	Ongoing monthly health forum	One of many sessions	Observer	15-20	Nurse	Ongoing regular education	Asian but non-Chinese health professional
	Diabetes awareness session	Community members, community organisation	Cantonese	Single session for existing group	One session	Observer & co-educator	10	Bilingual health educator (not clinician)	Peer-learning approach	Interactive tool (Feltman™), existing established relationship among participants
	Individual consultation with people with diabetes	Patients in community, community health service	Cantonese Mandarin English	15x Individual consultations	All sessions	Educator	1	Dietitian	Individual education	Australian-trained dietitian

\*When applicable, the same classification of educational approaches as the systematic literature review was used

### Interviewing

The secondary form of data collection was via interview. Interview data allowed an understanding of the observed phenomenon from a different viewpoint, triangulating the observation data. It also allowed the researcher to clarify details of her observations including obtaining general information for an overview of the diabetes care system at the various field sites.

Interviewing of health professionals was conducted in all the seven case studies. A summary of the different interview approaches, their characteristics and the applications in this present study is provided in Table 17.

Table 17: Interview approaches and applications in this present study (adopted from Gray, 2009)

<b>Interview approaches</b>	<b>Characteristics</b>	<b>Applications in this study</b>
Semi-structured interviews / in-depth interviews	Interviewer uses open-ended questions during conversation followed by probing questions, data collected is usually used for qualitative analysis	This method was used at interviews with the health professionals who were involved in diabetes programs observed in Singapore, Beijing, Hong Kong and Melbourne.
Non-directive interviews	Interview is used to explore a topic in order to answer research questions but there are no pre-planned questions	This method was used during interviews with dietitians and diabetes educators (who were not involved in the observed program) in Singapore, Guangzhou and Perth.
Informal conversational interviews	Interview relies on the spontaneous generation of questions as the interview progresses, flexible to whatever path the interview takes	The informal conversational interview method was used at unplanned opportunistic interviews with patients during observations in Singapore, Guangzhou, Hong Kong, Sydney and Melbourne.

The interviews conducted for each case are summarised in Table 18, with details on the interviewees, the purpose of the interview and format of recording. As tape-recording interviews was deemed culturally inappropriate in most of the international case study field-sites, interview data were captured via handwritten notes at the interviews or reflection immediately after the interviews.



Table 18: Summary: the interviews conducted at each case

	Interviewees	Purpose of the interview	Format of recording
SINGAPORE	Facilitator of the Chinese diabetes education workshop	To review the development and reputation of program, delivery experience of facilitator, patients' satisfaction of the program	Handwritten notes
	Dietitian at various hospitals	To explore health professional's experience in delivering diabetes education to Chinese patients	Reflection afterwards
	Health promotion officer		
	Facilitator of health promotion talk	To review the development, reputation, delivery experience, patients' satisfaction of the program	Handwritten notes & reflection
	Patient-participants in observed programs	To explore patients' satisfaction with the program and usual diabetes care practices	Reflection afterwards
GUANGZHOU	Facilitator of the observed inpatient diabetes education program	To review the development, reputation, delivery experience, patients' satisfaction with the program	Reflection afterwards
	Patient-participants in observed programs	To explore patients' satisfaction with the program and usual diabetes care practices	Reflection afterwards
	Government officer	To explore diabetes care service in the local area	Reflection afterwards
SYDN	Patient-participants of the observed programs	To explore patients' satisfaction with the program and usual diabetes care practices	Reflection afterwards
HONG KONG	Researcher at a privately funded community health organisations	To facilitate entry to diabetes education services in Hong Kong	Reflection afterwards
	Founder of a community-initiated organisation	To review the development, reputation, delivery experience, patients' satisfaction with diabetes education service	Transcript of taped interview
	Diabetes nurse at a privately funded community health organisations	To explore health professional's experience in delivering diabetes education to Chinese patients	Reflection afterwards
	Nurse at a public hospital		
	Dietitian at a public hospital		
BEIJING	Project officer of Happy Life Club	To review the development, reputation, patients' satisfaction with the program	Transcript of taped interview
	Evaluation researcher of Happy Life Club project	To survey the delivery and evaluation of the program	Handwritten notes & reflection
PERTH	Facilitator of Chinese diabetes programs	To review the development, reputation, delivery experience, patients' satisfaction of the program	Handwritten notes & reflection
MELBOURNE	Chinese health educator	To review the development, reputation, patients' satisfaction with the program	Transcript of taped interview
	Dietitians at community health services	To explore health professional's experience in delivering diabetes education to Chinese patients	Transcript of taped interview
	Dietitian in private practice		
	Endocrinologist		
	Diabetes nurse educators at community health services		

## Results

Results of this study had been summarised as three separate publications which have been published or submitted to peer-reviewed journals. These papers were written to answer the pre-determined research questions:

- How do Chinese patients and facilitating-health professionals behave during diabetes education sessions?
- How can diabetes education be culturally tailored to meet the unique needs and expectations of Chinese patients?
- How does experience including migration impact on the diabetes journey experienced by Chinese Australian patients?

The first paper, titled: *Optimising the effectiveness of diabetes education in an East Asian population* was published in *Nutrition and Dietetics* in February 2017. The second paper, titled: *Culturally tailored diabetes education for Chinese patients: A qualitative case study* was published in the *Journal of Transcultural Nursing* in November 2016. A final paper titled: *Diabetes management in a foreign land: A case study on Chinese Australians* was submitted to *Health & Social Care in the Community* in November 2016. These three papers are presented in their published or submitted format within this thesis.

An invited publication in the *Australian Diabetes Educator* (a practitioner journal) was also prepared and published in March 2016 – see the Appendix for the article. This article was specially written to target Australian diabetes practitioners, with the aim of influencing clinical practice in diabetes education in Australia.

## ORIGINAL RESEARCH

# Optimising the effectiveness of diabetes education in an East Asian population

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*Department of Nutrition and Dietetics, Monash University, Notting Hill, Victoria, Australia***Abstract**

**Aim:** To explore the collective patterns of learning behaviours and preferences of Chinese people during diabetes education. The study was carried out across three countries and aimed to identify strategies that could be used to tailor diabetes education to Chinese people.

**Methods:** A case study approach was undertaken in three countries (Australia, China and Singapore) using participant observations and qualitative interviews. Purposive sampling was used to select field sites before a snowball technique was employed to identify relevant interviewees. Thematic analysis with pattern matching was used for data analysis.

**Results:** A total of 39 participant observations and 22 interviews were conducted. Chinese people with diabetes were observed seeking advice and recommendations from health professionals. When told clearly what to do, they strived for full compliance. They tended to be submissive during diabetes education and were not likely to raise concerns, negotiate or participate in making medical decisions. They appeared to prefer prescriptive concrete instructions rather than more flexible conceptual education and to believe that behavioural change should be achieved by individual willpower and determination, resulting in an 'all-or-nothing' approach. Regular repeated information sessions were reported to establish rapport and trust.

**Conclusions:** For diabetes education to be culturally modified for Chinese people, there is a need to consider their unique philosophies and behaviours during education to support lifestyle changes. Building trust from the early stages of education was achieved by encouraging rapport through the provision of clear and precise instructions. This should be done before engaging in an open discussion of implementation strategies. Once the trust is built, healthy behaviour change may follow.

**Key words:** education, migrant/refugee health, qualitative research, type 2 diabetes.

**Introduction**

A healthy diet and regular physical activity are the 'cornerstones of management' for people with type 2 diabetes.<sup>1</sup> Although diabetes education that focuses on facilitating a healthy lifestyle has the potential to optimise glycaemic control and reduce diabetes complications,<sup>2</sup> the translation of education programs into real-world health-care settings is often problematic.<sup>3</sup> This challenge becomes even more significant when working with diverse population groups as health professionals need to be aware of cultural differences and deliver a service that is sensitive to the specific group's cultural beliefs, behaviours and needs.<sup>4</sup>

The burden of type 2 diabetes is disproportionately higher among Asian populations, with the Chinese being the world's largest and rapidly growing population with this disease.<sup>5</sup> Despite this, robust evidence on the most effective delivery of diabetes education to Chinese is still lacking. Current Chinese Guidelines for Type 2 Diabetes Care and Education<sup>6</sup> remain predominantly based on Western literature, and the transferability of this evidence to support behaviour change in Chinese people remains unknown. Despite efforts to incorporate 'cultural sensitivity' when tailoring interventions for non-Western communities,<sup>7</sup> translated diabetes education models based on Western participatory approaches have been found to be foreign, contributing to stress, frustration and even anger for the Chinese.<sup>8</sup> Furthermore, 'culturally modified' interventions may not increase effectiveness.<sup>9</sup> A change in approach is needed whereby diabetes education programs are designed that specifically address cultural philosophies and behaviours rather than rely on simply language-translating or 'culturally modifying' the Western diabetes education model.

The objective of this study was to explore the collective patterns of learning behaviours and preferences of Chinese

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people during diabetes education across three countries and identify cultural-specific tailoring strategies that appear successful in the diabetes education directed at Chinese people.

## Methods

A case study approach<sup>10</sup> was employed using ethnographic data collection methods including participant observations and qualitative interviews. Case study was the most appropriate method as it allowed in-depth exploration of diabetes education in its naturalistic setting bounded by time and location. Data collection was conducted between August 2012 and December 2014 in Cantonese, Mandarin or English at seven field sites across three countries: China (Beijing, Guangzhou and Hong Kong), Singapore and Australia (Melbourne, Sydney and Perth). These field sites were purposefully chosen for inclusion to capture traditional populations (Beijing and Guangzhou), Western-influenced Chinese populations (Hong Kong and Singapore) and Chinese living in a Western country (Australia). The diversity allowed an exploration of consistent cultural behaviour patterns of the Chinese across different countries. The study was approved by the Monash University Human Research Ethics Committee (Project no. CF12/1186–2012000582).

This study was informed by health behaviour and cultural value theories. The *theory of reasoned action*,<sup>11</sup> *protection motivation theory*,<sup>12</sup> *self-regulation theory*<sup>13</sup> and the *trans-theoretical model*<sup>14</sup> explain people's behaviours when presented with information from health professionals. They suggest that behaviours are driven by normative beliefs, perceived benefits and threats of intended actions and feelings of self-efficacy. These theories have informed much of the health education design for people with type 2 diabetes.<sup>15</sup> In the present study, these health behaviour theories helped to ground the researcher in the principles of behaviour change promotion while observing patterns of diabetes education, providing a deeper understanding of the delivery and facilitation formats health professionals employed. In particular, data on health professionals' persuasive communication techniques were recorded to understand the underlying Chinese-specific cultural elements in behaviour change promotion. During observations, attention was given to the transferability of self-regulation and stages-of-change theories for the Chinese population by examining the behaviour change process of Chinese people with diabetes. The present study also recognised that culture shapes beliefs, health behaviours and practices, including the understanding of symptoms, perceived necessary health-promoting actions, help-seeking habits and coping strategies for dealing with chronic disease.<sup>16</sup> While many health professionals may modify diabetes education content to be more culturally appropriate for diverse groups, they may omit adapting their delivery format to cater for the other factors that can influence learning or lifestyle behaviours during diabetes education. Education researchers who have studied students from Confucian-heritage

cultures (including the Chinese) have highlighted their dominant learning approaches, including *memorisation with understanding*, *effort attribution* (the belief that ability can be improved by working hard) and the *Confucian influence on an unquestioning acceptance of knowledge from their teacher*.<sup>17</sup> While the authors acknowledge that Confucianism is only one of major ancient philosophies in the Chinese culture influencing behaviours,<sup>18</sup> the influence of these learning approaches has not previously been examined in the context of diabetes education. In the present study, this novel focus has provided new insights during our interpretation of the analysed data.

The first author (TC) is a dietitian of Chinese cultural background and is fluent in Mandarin, Cantonese and English. Participant observations and interviews across all field sites were therefore conducted from an 'emic' or insider's perspective,<sup>19</sup> allowing TC to draw on her own cultural knowledge and minimise any compromise of data quality in translation.

Observation is a systematic and purposeful research method that has the strong advantage of unfolding the complexity of phenomenon in the natural environment.<sup>20</sup> During participant observations, the researcher sat in on the diabetes education session, with an observation template, blending with participants and collecting observational data on the behaviour of both the facilitating clinicians and the participants, as is recommended in observational methods.<sup>20</sup>

Only diabetes education sessions targeted at Chinese people were chosen for inclusion in the study. Sessions were purposefully selected to capture a variety of settings, size, delivery methods and demographics of participants to enhance richness of data.<sup>21</sup> Diabetes education services across the three countries were identified and recruited into the study.

In the Melbourne case study, TC used a reflective log to collect data post-consultations with Chinese people with type 2 diabetes. Opportunistic interviews, with health professionals and people with type 2 diabetes from the same services recruited via snowball sampling, were used to supplement the collected data from observations. Interview questions for health professionals were designed to further explore individual health professionals' cultural understanding, their experience of modifying diabetes education to suit Chinese culture and the perceived effectiveness of their approaches. Interview questions for the people with diabetes focused on their experience of the attended diabetes education sessions and if their diabetes management needs and expectations were met. Verbal consent was obtained from all participants prior to interviews. Where possible, in addition to notes, the interviews were tape-recorded, transcribed and translated. Data collection continued until theoretical data saturation was achieved.<sup>22</sup>

Thematic analysis with pattern matching<sup>23</sup> was adopted, whereby patterns were identified and matched using comparative analysis, within and across case studies, to strengthen credibility. The analysis was also grounded by the abovementioned health behaviour and cultural value

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theories to help explain and interpret the collected data. This was assisted by QSR-Nvivo 10 (V10.0.138.0 (64bit), QSR, Australia). Analysis involved the open coding of text, grouping codes into categories, and then generating themes from these categories. Both methodological triangulation and investigator triangulation were applied, whereby data analysis of different data sources was first undertaken by TC followed by a second researcher (CP). All interviews, with health professionals (HP) and person with diabetes (PWD), and field notes (FN) from participant observations quoted here were made originally in Chinese and then translated to English by TC. Translation was verified by an independent bilingual researcher.

## Results

A total of 39 participant observations and 22 interviews (Table 1) were conducted across the seven case studies. The participant observations were undertaken in various settings and in different formats, including individually, in small groups and in large lecture-style formats; by diabetes nurse educators or dietitians; and in both public and private health system settings. This diversity provided depth and breadth, enhancing richness of the findings. Analysis of these data yielded eight main themes (Table 2).

Health professionals repeatedly described the Chinese as a hard-to-engage group. They described difficulties at two levels: attracting people to attend diabetes education services and engaging people with diabetes during consultations to discuss self-management. While health professionals in Asia employed various strategies to attract Chinese people to attend diabetes education sessions, such as multiple invitations, the health professionals in Melbourne reported that, despite years of effort, diabetes services targeted at Chinese Australians remained poorly attended. They suggested that this could be because of a mismatch between the clinicians' expectations and service users' needs.

An experienced diabetes nurse working in a Melbourne suburb where many Chinese congregated complained:

*'I don't know why they [the Chinese] are not knocking down my door! And they should be, because we are right in the centre of a huge Chinese population, with well-known high prevalence of diabetes!'* (Melbourne HP1)

The poor attendance of Chinese people at diabetes education programs was found to be multifactorial. One diabetes nurse educator shared her view that logistical barriers, including transport and language barriers, reduced service access. An experienced dietitian felt that people were turning away from services employing the culturally conflicting Western participatory approaches as clients appeared uneasy, and sometimes frustrated, when invited to collaborate in care planning. She reported:

*'They [Chinese clients] don't want to participate in care-planning, they kept saying "just tell me what to do, I will try hard!"'* (Singapore HP1)

Chinese people were observed to be passive learners at diabetes education sessions, whereby they readily accept instructions from health professionals. A Singaporean dietitian noted how her Chinese clients *'sit back, listen and nod to everything recommended'* (FN from Singapore). A dietitian interviewed in Melbourne described similar passive and reglemental behaviours shown by her Chinese clients:

*'[They say]: "Ok! This food is not good? I must change!". They were very firm, verbally. And they tend to be very black-and-white, yes or no, good or bad, very distinct. And very little negotiation.'* (Melbourne HP2)

Chinese people were observed exhibiting a strong determination to change and readily accepted lifestyle recommendations given to them. They appeared studious during the observed diabetes education classes and did not question their health professional educators. Chinese people usually sat up straight, listened attentively and wrote down

**Table 1** Details of collected qualitative data

Case study	Participant observations	Interviewees
Beijing, China	NA	Two diabetes program coordinators
Guangzhou, China	Six small group educations in hospital setting; didactic delivery	Two diabetes nurses
Hong Kong	Five patient-led sessions in community setting; group education	One patient-leader
	One lecture in hospital setting	Two dietitians
	One lecture in community setting	Three diabetes nurses
Singapore	Six small group sessions in community setting; interactive workshop	One diabetes nurse
	One diabetes walking group	Three dietitians
Melbourne, Australia	Sixteen individual consultations with dietitian in a community health centre	One endocrinologist
		Three diabetes nurse
		Three dietitians
Sydney, Australia	Three group educations in a public library, with patient participation	NA
Perth, Australia	NA	One diabetes nurse

NA, not applicable.

**Table 2** Themes and descriptions emerging from acquired qualitative data regarding philosophies and behaviour of Chinese patients

Themes	Descriptions
Hard to engage	Chinese patients were described as a hard-to-engage community, both at service attendance and during care planning in individual consultations.
Readily accept instructions	Chinese patients appeared as passive learners during diabetes education sessions where they would politely agree to all clinician-recommended lifestyle changes.
Focus on management details	Appreciation of precise diabetes management detail was very strong.
Reluctant to argue or raise concerns	While Chinese patients appeared highly compliant and did not negotiate with their clinician, they failed to raise their concerns or openly discuss implementation challenges.
Perceived requirement to comply with any set of 'gold-standard' recommendations	An individualised care plan was not appreciated. Chinese patients looked for a set of 'gold-standard' recommendations. They strongly believed that despite their individual needs, they should try and achieve these goals through will power and self-determination.
Attracted to factual information	Chinese patients were attracted to factual information, and many adopted self-education techniques for gathering diabetes management information.
Unique motivators to change	Other than factual information, Chinese patients were motivated to change behaviours by authority reinforcement.
Unique behaviour change pattern	Once clinicians built trust with their Chinese patients, behaviour change happened very quickly.

most things the health professionals said, sometimes photographing the information slides.

Some interviewed Chinese people with diabetes reported that they sought detailed management information to ensure complete compliance with their health professional's recommendations. Such 'focus on management details' behaviours was described by an interviewed Australian dietitian:

*'They presented to be very thirsty for information and knowledge. I mean, they just have so many questions—"Can I eat this product? Can I eat that brand of bread? Why?" A lot of questions, specific questions'.* (Melbourne HP2)

This demand for very specific and precise information caused some health professionals to avoid Chinese clients because of the time and effort they demanded. A bilingual dietitian in Melbourne, with 30 years of local and overseas clinical experience, revealed that she had to close her Chinese-specific clinic as she found working with Chinese people was just too exhausting.

Health professionals repeatedly reported that their Chinese clients would specifically ask for a detailed meal plan prescribing a range of appropriate food choices. In extreme cases, people requested 30-day meal plans (FN from Singapore), so they could be entirely compliant and do exactly as they were told every day of the month. The interviewed dietitian claimed that the Chinese clients did not appreciate the concept of self-regulation, saying:

*'Asians like to be spoon-fed'.* (Singapore HP2)

Diabetes education delivered by health professionals trained in the West was criticised by Chinese people with type 2 diabetes for focusing on a conceptual understanding

of diabetes and facilitation of self-care. Such teaching was not appreciated for its lack of practicality:

*'The clinicians only provide patients with the theory, but they [the clinicians] don't realise that when I eat out, there isn't information on how I could count the carbohydrate of my pork-chop noodles'.* (Hong Kong PWD1)

Health professionals also described their Chinese clients as rigid thinkers who demanded very clear instruction. Dietary instructions had to be specific, with lists of 'foods to avoid', rather than more ambiguous recommendations, like 'eat in moderation'. Singapore interviewee A reported:

*'Terms like "once in a while" and "sometimes food" are dangerous. I had an experience of naming Mars Bars as a "sometimes food" and the patient misinterpreted it as a "dietitian-said-ok" option and ended up replacing his regular chocolate with Mars Bars. Since then, I label it as a "no-no food".' (Singapore HP2)*

The Chinese people were observed to be largely compliant, reluctant to argue or raise concerns with their health professional, raise concerns or openly discuss implementation challenges. In Sydney, the researcher observing a group diabetes education session overheard participants disagreeing among themselves with the dietitian's instruction for a strict restriction of rice intake. However, no one openly challenged this or raised concerns on the practicality of the recommendation. Among themselves, they quietly agreed to ignore it.

In a similar context, the researcher recorded another experience in Hong Kong that again highlighted the habit of Chinese people in keeping quiet about their concerns. During a 2-hour didactic lecture discussing diabetes from a traditional Chinese medicine perspective, attended by about

100 participants and delivered by a Beijing professor, the researcher noted:

*'I was finding it extremely difficult to understand this professor speaking in her very-heavy-Mandarin-accent Cantonese. I saw people in the audience frowning, losing attention, and fidgeting. However, no one voiced out the problem to the presenter! Until half-way through the presentation, the professor suddenly stopped and asked if everyone could understand her well. It was only then people shouted out that they couldn't catch a single word!'* (FN from Hong Kong)

Similarly, in Melbourne, the researcher documented her frustration in providing dietetic advice to a Chinese client with suboptimal glycaemia who insisted on 'trying harder' rather than engaging in an open discussion about barriers to behaviour change. The researcher noted:

*'If he discussed his work and family situation with me, I could have given him alternative dietary suggestions!'* (FN from Melbourne)

People with diabetes indicated that it was not important for health professionals to know about their existing lifestyle, dietary preferences and implementation challenges as they perceived that it was a requirement to comply with any set of 'gold-standard' recommendations through their strong willpower and determination. They saw health professionals as experts who would provide prescriptive scientific-based dietary and exercise plans. Their role was then to do their best in complying with these recommendations.

Collecting dietary history information from Chinese people was found to be difficult. A dietitian reported finding that when Chinese clients were asked to report their usual diet, they were either reluctant to provide any information at all or reported an idealised meal pattern designed to impress. At times, asking for a diet history appeared to impede rapport building.

Seeking audience participation and inputs at diabetes group education was also observed to be challenging. People with type 2 diabetes were observed to avoid making eye contact at a Sydney diabetes workshop when the facilitator invited participants to indicate what they already knew about diabetes.

Chinese people were seen to be attracted to factual information. A presentation given by a Singaporean exercise physiologist was observed to have a strong focus on the diabetes pathophysiology of exercise. He later claimed that this fact-laden approach attracted participants' attention and gained their trust in performing recommended physical activities. Chinese people with diabetes, across all observations, also appeared very proactive in seeking diabetes management information. The strong self-education and reading culture of China was evident in the Chinese diabetes community in Guangzhou. The researcher observed many people reading diabetes books in bed in the hospital ward. When interviewed, many Chinese people with diabetes told the researcher that the first thing they did at diagnosis was

buy a pile of books to read up on diabetes. The hospital visited in Guangzhou attempted to support this self-directed learning by providing diabetes information booklets at the group education sessions and by putting up posters on diabetes management in the hospital corridor. Patients and family were often seen in the corridor reading these posters.

Other than written materials, people also reported gathering diabetes information from the media, including television programs and social media. In both Guangzhou and Hong Kong, people with diabetes described collecting management information from well-known television programs where doctors were invited to speak about many health issues, including diabetes.

The researcher observed Singaporean Chinese people with diabetes busily signing up for physical activity programs after an exercise physiologist had concluded a talk on the physiological benefits of exercise. A set of unique motivators for change was noted, and that the promotion of a strong hierarchical health professional-patient relationship also appeared to motivate behaviour change in Chinese people. The Chinese appeared to see their health professionals as the authoritative figure in diabetes care. Apart from providing reputable health information, health professionals were perceived as 'diabetes police' who keep their clients on track with diabetes management. In an observed dietetic consultation in Melbourne, the client claimed that her regular appointments with a dietitian had pushed her to adopt a healthier lifestyle as she then felt responsible to the dietitian. At the end of each consultation, she often said:

*'I feel bad. You care for me so much, I must listen to you and do what you said.'* (Melbourne PWD1)

A diabetes nurse interviewed in a Hong Kong public hospital shared her experience in using 'top-down' hierarchy to motivate behavioural change. She would ring her 'naughty patients' fortnightly to check on their progress and 'nag them on making changes' (FN from Hong Kong). She highlighted that her regular contact with clients became a motivator to change lifestyle behaviours and that such unique relationships kept the clients disciplined which supported diabetes management.

Health professionals reported that regular repeated interventions in themselves may contribute to strengthening rapport. Chinese Singaporean people with diabetes were described as 'slow to warm up' (FN from Singapore) and were reported to take up to three sessions before the health professional was perceived as one of 'my people' (my friends) to be more readily engaged in discussion of their problems. Only once rapport and trust were built could the behaviour change process commence.

An observed unique behaviour change pattern across various diabetes education sessions was 'instant' behaviour change. Chinese people generally presented with a strong belief that they could control their desires and change their habits by exerting willpower. In several informal interviews



with Chinese participants attending the Melbourne diabetes support group, the participants told the researcher that diabetes management was simply a matter of '*being told what to do*' (FN from *Melbourne*). Once they had clear instructions, implementation was straightforward.

*'There seems to be no stages of change. It was a matter of gaining trust either over time or with presentation of knowledge, then providing the recommendations for the Chinese patients to make the change. The change process is just natural, no argument or negotiation.'* (FN from *Melbourne*)

## Discussion

This study explored the collective patterns of learning behaviours and preferences of Chinese people during diabetes education sessions across three countries and identifies cultural-specific tailoring strategies that appear successful in the diabetes education directed at Chinese people. To our knowledge, this is the first study to explore and understand recruitment, engagement and satisfaction with diabetes education in Chinese people consistently presented across three countries. The novel findings will inform optimal Chinese-specific tailoring of diabetes education and have implications for practice. The findings suggest that Chinese people tend to rely on self-education for diabetes information and only seek advice and recommendations from health professionals as the last resort. During diabetes education, they need to be told clearly what to do and then strive for complete compliance. They also tend to be submissive during diabetes education and are not likely to raise concerns, negotiate or participate in care planning. In general, they prefer prescriptive concrete instructions rather than more flexible conceptual education. Regular education over time facilitates therapeutic trust. Their motivators of change were unique; instead of taking action upon perceiving a threat to their health in a step-wise gradual change pattern, the Chinese appeared to believe a healthy lifestyle for diabetes management is achieved by individual willpower and determination, with an 'all-or-nothing' behaviour change pattern.

The findings identified a significant clash of cultures between a Western-orientated diabetes education approach and Chinese cultural philosophies and learning style, contributing to frustration expressed by both the health professionals and Chinese people in this study. Chinese people with diabetes collectively displayed a set of unique philosophies and behaviours that influenced all the stages of diabetes education, from building therapeutic relationships with health professionals to integrating education messages into their lifestyle. This cultural mismatch suggests a new way of understanding what 'person-centred care' in diabetes education means when working with the Chinese. Previous research has reported that Westerners value autonomy, independence and worldly success, while the Chinese virtues focus on societal hierarchy, respect for authorities and duty to the group.<sup>24</sup> Such cultural differences could explain why translated approaches that draw on individual's

pre-existing attitudes and behavioural intentions based on theory of reasoned action does not work well for Chinese people. Our findings confirm previous research which has highlighted that a structured and directive counselling approach is more effective than an autonomy-promoting approach.<sup>25</sup> Additionally, a facilitative person-centred approach has been criticised for not conforming to Chinese traditional cultural values and is likely to impact negatively on health professional-patient relationships.<sup>26</sup>

Confucianism, the major Chinese philosophy that forms the foundation of Chinese social structure and moral values and shapes behaviour development, may explain Chinese people's behaviours observed in this study. Confucian teaching emphasises how everyone should play their delineated role to maintain social harmony and a stable hierarchical social structure.<sup>24</sup> It has been reported that in Chinese culture, the fixed role in society, rather than personal preferences, determines behaviours.<sup>27</sup> Chinese people constantly relate self to others, exercising self-regulatory practices to suppress personal desires<sup>24</sup> and pursuing continuous learning towards self-perfection.<sup>28</sup> Furthermore, Chinese people have a strong belief that success comes from effort and willpower.<sup>29</sup> Chinese people, in this study, were observed to be readily educated and agreed to 'try hard' on adopting healthy behaviours as they may believe that keeping themselves healthy was the duty of each citizen to achieve harmony within the collective society.

The hierarchical structure and its ordering of relationships are seen as very important Chinese values, and people are to enact upon their role in the hierarchical structure.<sup>30</sup> As health professionals are regarded by the Chinese as authority figures, knowledgeable and highly respected,<sup>26</sup> Chinese persons take up the role as obedient listeners, with no 'talking back' or voicing opinions.<sup>30</sup> This hierarchical structure also defines the relationships between people, with a clear distinction between 'in-group people' (family, peers and those with established relationships) and 'out-group people'. Individuals will only connect closely to known 'in-group people', and they will treat 'out-group people' as strangers.<sup>30</sup> When attending diabetes education with a health professional whom the Chinese client has not met before, this study found that the person with diabetes experienced some difficulty in interacting with this 'out-group' person and could not openly discuss their problems. This could explain why Chinese people observed in the present study were described as 'slow to warm up', whereby trust took time to develop before the health professional gained the status as an 'in-group person'.

Western evidence indicates that health professionals who adopt a parental-like role and expect their clients to just 'follow orders' are likely to invoke negative attitudes in their clients with subsequent reduced compliance.<sup>31</sup> In comparison, we found that health professionals were instead seen employing the power in the hierarchical clinician-patient relationship to enhance treatment effectiveness. Potentially influenced by the rigid system social structures found in Chinese society, it appeared normal to trust information presented by an authority and do as one was told. Some



health professionals were seen employing innovative strategies to highlight their expert role by exhibiting extensive knowledge on diabetes management, while others took up a parenting or policing role in disciplining their clients.

These differences between Western and Chinese approaches to diabetes education deserve to be better understood. A more comprehensive understanding of how Chinese cultural values shape behaviours will allow better cultural tailoring of Chinese diabetes education. However, it should also be noted here that culture is only one of the factors shaping any human being.<sup>32</sup> Traditional cultural values may be fading among younger Chinese and those living outside China.<sup>33</sup> The Chinese should not be seen as a culturally homogeneous group. Cultural modification of diabetes education for Chinese should not be 'one-size-fits-all' but carefully designed to match the target population's demographics, including age, attachment to traditional cultural values, preference of health education style and constantly evolving relationship between health professional and the person with diabetes. Our study has limitations. As health professional-centred diabetes education sessions appeared dominant across the field sites, there was a lack of data collected when a person-centred approach was employed. We, therefore, may have missed exploring how Chinese people behave when they were given autonomy. However, it could be argued that a person-centred approach was so inappropriate for the Chinese that it was not practised. Also, the interviewees in this study were predominantly health professionals, with limited data obtained from the care-receivers' perspectives, which may present a more health professional-centred viewpoint. The health professionals in this study appeared to respond negatively to Chinese clients, and this may have presented a rather negative image of the Chinese people with diabetes. Lastly, it was not our objective to study the diversity of learning behaviours of the Chinese sub-populations. Further research on comparing the needs of Chinese sub-populations would be informative in designing a diabetes education strategy specific for the Chinese population.

In conclusion, there is a clear need for diabetes education to be culturally modified for the Chinese, with considerations of their unique behaviours during education and when making lifestyle changes. Chinese people tend to take a submissive learner role during diabetes education, especially at the beginning of care. Building strong trust from the early stages is achieved by encouraging rapport with Chinese clients and engaging them in an open discussion of implementation strategies. Once the trust is built, healthy behavioural change may follow.

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### Conflict of interest

No conflicts of interest to declare.

### Authorship

TSTC was involved in project design, data collection and analysis and drafting of this manuscript, with CP and KZW supervising the process. CP was also involved in investigator triangulation in data analysis. CBL provided support in writing the manuscript. All authors critically reviewed the manuscript and approved the final version submitted for publication.

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# Culturally Tailored Diabetes Education for Chinese Patients: A Qualitative Case Study

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## Abstract

**Purpose:** To explore the range of teaching approaches and cultural-tailoring elements used in diabetes educations directed at Chinese patients and to determine the strategies that appeared to best address Chinese patients' needs. **Design:** A case study approach in three countries was employed, using multiple ethnographic data collection methods including participant observations and qualitative interviews. **Findings:** Data were collected from 39 participant observations and 22 interviews across seven cases. Collective didactic education was most common. Individual clarification at the end of an education session was used to allow patients to derive their own management plan. Clinicians mainly provided information and used knowledge reinforcement to facilitate behavioral change. Participatory diabetes education models borrowed from the West did not translate well culturally and did not appear to meet Chinese patients' needs. **Conclusion and Practical Implications:** Diabetes education for the Chinese may be enhanced by building on traditional Confucian education strategies.

## Keywords

diabetes education, cultural tailoring, Chinese, qualitative research

## Introduction

Currently 8.3% of the world's adult population have diabetes and it has been projected that more than 592 million will develop the disease within 25 years (Guariguata et al., 2014). Asia forms the epicenter of this growing diabetes epidemic (Sicree, Shaw, & Zimmet, 2003) and China presents the largest and most rapidly growing diabetes population (Yang et al., 2010). Despite evidence that lifestyle interventions can optimize glycemic control and reduce the risk of diabetic complications (Colagiuri, Girgis, Elgenmann, Gomez, & Griffiths, 2009), few studies have examined optimal approaches for delivering diabetes education to Chinese in a manner that conforms with their culturally unique health beliefs and needs. The current Chinese Guidelines for Type 2 Diabetes Care and Education (Chinese Diabetes Society, 2010) are predominantly based on Western literature and their ability to effectively support behavior change in Chinese patients is largely unknown.

Cultural tailoring of diabetes education, or the utilization of a cultural understanding of health behaviors to modify an intervention (Pasick, D'Onofrio, & Otero-Sabogal, 1996), promotes greater glycemic improvement in ethnic minority patients with diabetes (Nam, Janson, Stotts, Chesla, & Kroon, 2012). Culturally tailored interventions generally incorporate ethnically specific content including language, food patterns, values, and customs, but few consider matching their delivery

format to the patient-participants' traditional process of learning. In a recent Australian study, Chinese patients explained that although their diabetes education had been given in their language and discussed traditional cuisine, it remained inadequate in meeting their needs. The Western participatory education approach applied in teaching the diabetes program was found to be quite foreign, contributing to additional stress, frustration, and even anger (Choi, Walker, Ralston, & Palermo, 2015). The mismatch between Western diabetes education "translated" into Chinese and the expectations of Chinese patients may also be exacerbated by socioeconomic and educational differences in the target population. Western diabetes education is often designed for people with relatively low educational attainment who come from poorer communities where diabetes prevalence is highest (Chen & Tunstall-Pedoe, 2005; Connolly, Unwin, Sherriff, Bilous, & Kelly, 2000). In contrast, Chinese patients with diabetes are more likely to come from high-income groups with more diverse education levels (Chen, Song, Hu, & Brunner, 2012).

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The objective of this study was to explore the range of teaching approaches and cultural-tailoring elements used in diabetes educations directed at Chinese patients and identify strategies that appear best to address Chinese patients' needs.

## Method

This study employed a case study approach (Yin, 2009b) to collect qualitative data in naturalistic settings bounded by time and location, using ethnographic data collection methods including participant observations and qualitative interviews. Data collection took place at seven sites in four Asian (Beijing, Guangzhou, Hong Kong, and Singapore) and three Australian (Melbourne, Sydney, and Perth) cities. The study was approved by Monash University Human Research Ethics Committee; Project No. CF12/1186—2012000582).

The approach taken to case studies was first informed by Western educational, health behavior, and cultural-learning theories as many of these theories (including cognitive-learning, constructivist, humanist, and behaviorist theories) have influenced strategies for diabetes education designed to optimize patient learning (Colagiuri et al., 2009). In examining diabetes education for Chinese, however, it was also necessary to consider traditional approaches to learning, in particular patterns of Confucian teaching which are deeply engrained in Chinese culture. Confucian teaching often takes a clear hierarchical approach to education where learners are expected to listen obediently to highly authoritarian educators who present them with detailed information using directive teaching methods (Biggs, 1996). Chinese learners, exposed for years to this type of education may then take a more passive and compliant approach in obtaining diabetes management information, and tend to accept new knowledge unquestioningly (Biggs, 1996). This study examined how these different attitudes and Confucian-orientated teaching and learning preferences influence Chinese diabetes education.

Taking a constructivist position (Guba & Lincoln, 1994), the multiple factors affecting Chinese engagement with diabetes education were explored via direct observation of behaviors at diabetes education sessions. In addition, narrative experiences were sought from clinicians and patients themselves. In particular, for clinicians, we probed the rationale used for the design of diabetes education programs targeted at the Chinese and for Chinese patients, we looked for perceived effects of culturally tailored education content and responses to the delivery mode. As the first author (TC) who collected data directly for all seven cases, has Chinese heritage and has lived in various Asian cities, participant observations and interviews were conducted from an "emic" or insider's perspective (Liamputtong, 2009). Across the cases, TC consistently spent up to 4 weeks at field sites, and became immersed in the local culture for data collection. Moreover, with Chinese language skills, data were collected in both Cantonese and Mandarin, minimizing potential translation

error. This ethnographic approach aimed to assist exploring behavior in a natural environment (Angrosino & Rosenberg, 2013).

For each case, data collection was bounded by its location and time. Chinese diabetes education services in the seven cities were carefully selected for their varied *mode of delivery*, including individual consultations, single-session versus multiple group education; *topics covered*: such as exercise alone versus multidisciplinary content; and *approaches*, for example, interactive peer-learning versus didactic lectures. For each case study, the diabetes education service of interest was identified and the facilitators were contacted for observation in this study. This was followed by snowball recruitment within the case sites to include other relevant Chinese diabetes education services for observation and invite relevant clinicians for interview. All clinicians approached were included in the study and none were excluded.

TC collected data by participant observation. Using this method, TC attended diabetes education sessions, blending with participants, and observing behaviors of both facilitating clinicians and patient-participants during their diabetes education. Using an observation template, education content, delivery format, and learning principles were recorded and compared with the Australian National Evidence Based Guideline for Patient Education in Type 2 Diabetes (Colagiuri et al., 2009), to highlight cultural-tailoring elements. TC also practiced reflexivity (Liamputtong, 2009) and recorded explicitly her position and personal perspectives while making sense of observed phenomenon and documenting own interpretations of cultural-tailoring strategies in the different settings. Opportunistic interviews with clinicians and patients were held to elicit further information and explore elements of diabetes education specifically modified for their particular Chinese populations. Where possible, interviews were tape-recorded, transcribed, and translated, otherwise extensive field notes were taken, supplemented by TC's personal reflections.

For each case study, data collection continued until theoretical data saturation was achieved (Morse, Barrett, Mayan, Olson, & Spiers, 2002). Field notes and transcripts were translated into English, their accuracy certified by independent bilingual researcher. These data were then coded and analyzed thematically with pattern matching (Yin, 2009a) by TC using QSR-NVivo 10 (V10.0.138.0 [64bit], QSR, Australia). Analysis involved open coding of text, grouping codes into categories, and then generating themes from these categories. To enhance rigor, a subset of data (full set of field notes collected in Singapore, one Hong Kong interview transcript, and one Beijing interview transcript) was analyzed independently by another author (CP). Field notes and interview quotes were used to illustrate the truthfulness of studied phenomenon. Analysis also included identification of the predominant education strategy and what was observed to best address patients' learning needs.



**Table 1.** Details of Observed Diabetes Education Sessions and Interviewees Who Participated Across the Seven Case

Study. Case study	Observed diabetes educations	Interviewees
Beijing, China	NA	Two diabetes program coordinators
Guangzhou, China	Six small group educations in hospital setting; didactic delivery	Two diabetes nurses
Hong Kong	Five patient-led sessions in community setting; group education	One patient-leader
	One lecture in hospital setting	Two dietitians
	One lecture in community setting	Three diabetes nurses
Singapore	Six small group sessions in community setting; interactive workshop	One diabetes nurse
	One diabetes walking group	Three dietitians
Melbourne	Sixteen individual consultations with dietitian in a community health center	One endocrinologist
		Three diabetes nurse
		Three dietitians
Sydney	Three group educations in a public library, with patient participation	NA
Perth	NA	One diabetes nurse

Note. NA = not available.

## Results

Data were collected from 39 participant observations (69 pages single spaced text) and 22 interviews (eight nurse educators, six dietitians, four medical doctors, and five patients). Ten were tape-recorded totaling 428 minutes across the seven cases. Details of diabetes education sessions observed and interviewees are presented in Table 1. The broad range of education types included within the cases allowed rich data to be recorded of patients' behaviors in different settings. Analysis of these data yielded 10 themes (Table 2).

### *Predominance of the Medical Model in Diabetes Care*

In Asia, diabetes care adopted a medical model where diabetes education that focused on lifestyle modifications was delivered to patients only occasionally and was observed to be an optional supplement to medical treatment. For example, in Guangzhou, diabetes was usually identified very late in disease progression, when patients were often admitted to hospital for 2 to 3 weeks for intensive medical treatment and insulin titration. During this period, diabetes classes were available for voluntary attendance, or occasionally, individual diabetes education by the bedside was provided by the nurses. The emphasis on acute medical treatment was observed to be given higher priority by patients and clinicians over lifestyle modification. This medical treatment-orientated approach was also consistently reported by dietitians working in public hospitals in Singapore.

When it was provided, diabetes education was observed to be poorly planned and executed by clinicians. TC recorded the lack of structure and organization of a diabetes education program delivered in the nurses' locker room in Guangzhou:

... the facilitator was so laid-back, started late with no apology, discussed a topic different from scheduled. . . . And there was no structured facilitation like ticking off patients' names, stopping patients or nurses from walking in and out of the room. (Field note from Guangzhou)

### *Top-Down Delivery of Diabetes Education*

"Collective" or group, rather than individual, diabetes education was commonly used across all case studies. In groups of varying size, education sessions were often delivered in a top-down didactic, clinician-directed manner with few strategies used to encourage audience participation. Where participation was invited, patients appeared reluctant to partake in discussions and activities. In a Guangzhou session, all 26 patient-participants failed to participate in the exercise section given at the end of the class, everyone quietly disappeared, leaving the two facilitators alone to complete the physical activity. A similar reluctance was noted in the programs observed in Sydney. When the class facilitator posed a question and invited input from her audience, participants appeared uncomfortable and kept quiet. Participation only increased during the questions-and-answer section. TC noted:

Culturally, Chinese respect their educator and never challenge them with questions . . . waiting for the Question-and-Answer section to humbly seek clarifications on their dietary understanding. (Field note from Sydney)

Patients seemed to wait for their turn to talk. Experienced clinicians across the Hong Kong, Singapore, and Sydney case studies were consistently observed placing a question-and-answer section at the end of their didactic diabetes lectures.

Chinese people like to ask questions in relevance to own health conditions, after the content is delivered. So you need to leave time for questions. (Field note from Singapore)

### *Individualizing the Top-Down Model*

Some innovative strategies were used to tailor diabetes education to individuals. Question-and-answer sections allowed patients to clarify their understanding, reflect on individual habits, and seek further practical suggestions. In Hong Kong, an annual diabetes group session observed at a public hospital

**Table 2.** Themes Emerging From Qualitative Case Study of Chinese Diabetes Education.

Themes	Descriptions
Predominance of the medical model in diabetes care	Diabetes education for lifestyle management was seen only as an optional supplement to the main pharmacological treatment.
Top-down delivery of diabetes education	A top-down delivery was generally used with minimal audience participation. Innovative strategies were used to facilitate individualization during the top-
Individualizing the top-down model	down delivery of diabetes education.
Sole practitioner approach	The nurse played a "gatekeeper" role in diabetes care and only patients with high needs were referred to allied health practitioners.
Focus on information provision and reinforcement	Clinicians focused on information provision and examination of knowledge to motivate behavior change.
Single-session allied health service	Patients usually only received a single-session allied health service.
Translated diabetes education	Some diabetes education content and concepts did not seem to translate well culturally.
Not meeting patients' needs	Patients complained that structured diabetes education was not meeting their needs.
Patients find their own ways to manage diabetes	Patients took charge of their diabetes by learning about diabetes management from many different sources and by supporting and learning from one another.
Potential risk in diabetes peer education	There were observable risks in patients sharing misinformation with their peers.

incorporated individualized advice by giving patients, prior to the group session, a handbook to record their individual anthropometric, biochemical, and clinical results. During the group session, the facilitating nurse then frequently directed attention to these individual results with the aim that patients might reflect on their results and identify lifestyle factors for improvement. Furthermore, prescription of tailored meal plans with individualization of life schedules, food access, and taste preferences, were also seen to be used by Singaporean and Hong Kong dietitians.

### *Sole Practitioner Approach*

Across cases in Asia, the nurse often played a key role as "gatekeeper" in diabetes care. Nurses were responsible for providing general diabetes management information and only some patients were sent to see Allied Health professionals. In Hong Kong, the interviewed hospital dietitian described the triage system where the nurse would only refer patients with multiple comorbidities or an expressed intense interest in nutrition or foot care to see the dietitian or podiatrist, respectively. Allied health professionals were considered as specialists, with referral pathways similar to an endocrinologist. In Hong Kong, dietitians reported seeing only complex cases, seriously ill with diabetic nephropathy or postamputation and dietetic intervention was thus perceived as only necessary at a very late stage of diabetes.

The nurse "conducted blood tests, eye check, anthropometric and diet assessment, nutrition counselling, foot check and care education" (Field note from Singapore). Little multidisciplinary care was observed, potentially leading to suboptimal care. At one dietary information session, TC recorded:

The nurse was providing misleading nutrition information, telling the participants to go on extreme dietary restriction for optimal glycemic control when most patients are already underweight! (Field note from Singapore)

In Australia, the lack of Chinese-speaking clinicians often meant that other allied health practitioners had to lead diabetes education. One diabetes nurse educator from Perth reported that as the only Cantonese-speaking clinician, she was the sole facilitator for a 6-week translated Chinese diabetes program, grocery-shopping tour and cooking class, and often took the role of dietitian as well as nurse.

### *Focus on Information Provision and Reinforcement*

It was observed that many diabetes education programs in Asia emphasized disease mechanisms and provided patients with very detailed information about diabetes. Asian clinicians shared their belief that behavioral change would be promoted by this factual information. Indeed, their patients were observed to be very interested in the pathophysiology of diabetes. In Singapore, TC attended a lecture by an exercise physiologist who gave a very complex and detailed presentation describing the biochemical pathways of glucose oxidation in muscle and the results of clinical trials that supported the benefits of exercise.

I doubt any participant could understand any of the[se] theories. However, I can't deny that the group stayed very attentive when the complicated content was discussed. And more importantly the group were empowered to start exercising (many were

booking themselves into the exercise group)! (Field note from Singapore)

At a *World Diabetes Day* event in Guangzhou, there was a similar focus on the presentation of complex diabetes information to audiences of around 100 people. This was followed by a “verbal quiz with rewards.” Response was very high as patients enthusiastically tried to demonstrate their diabetes knowledge, proudly counting the number of gifts they received. This observation further highlighted the importance to Asian patients of acquiring and mastering detailed disease knowledge.

### *Single-Session Allied Health Service*

Both clinicians and patients emphasized diabetes information rather than the provision of support for behavioral change. In Singapore, dietitians interviewed explained that most patients attended the outpatient clinic only once as they believed one session was sufficient for them to obtain all the necessary diabetes management information.

... patients don't want to return for diet review as they don't see the value when they don't gain anything tangible—nutrition counselling is just words. Dietitians are seen as information source. Dietitians here [in Singapore] tend to “tell patients everything” at first session expecting the patients not returning. (Field note from Singapore)

When no new information was offered at a follow-up session, the service was reported to not be appreciated.

... I have a feeling that they [the patients] think they have seen me, listened to what I got to say, then that's it. (Melbourne interviewee A)

### *Translated Diabetes Education*

Clinicians in the case studies made an effort to optimize patient outcomes by shaping the diabetes education service to meet their patients' needs and behaviors. However, as there are currently no guidelines available for cultural-tailoring approaches, many clinicians were found to employ strategies developed by trial and error. In Singapore, TC witnessed many health care organizations borrowing diabetes education tools and techniques from the West and checking out their applicability on the Chinese. These included using the Diabetes Conversation Maps™, incorporating motivational interviewing in diabetes consultations, and trialing activity-based learning such as supermarket tours and cooking demonstrations. Although the Singaporean clinicians tried to adapt the content to the local Chinese patients' needs, these translated programs were not well-received. For example, patients observed sitting around a table looking at a Diabetes Conversation Map seemed very reluctant to participate, while clinicians employing motivational interviewing in diabetes

consultations reported difficulties in sustaining free-flowing conversations with patients who still expected just to be told what to do. These Western techniques based on the idea of individual patient empowerment appeared to remain a foreign concept for many Chinese patients.

Australian-trained Chinese dietitians also described the challenges of translating diabetes education services for Chinese.

I feel that our Western education theories are conflicting against the traditional Chinese cultural thinking. In the Western education theories rely heavily on what the patient wants but traditionally, Chinese patients are more used to being told what to eat, actions to take for disease management. I found it very tricky and problematic. (Melbourne interviewee A)

In a diabetes education session in Singapore, the facilitator tried to introduce the idea of goal setting which she described as “a description of actions to take for better health before next session” (Field note from Singapore). One patient-participant was observed quietly telling his neighbor that as he had made an already achieved “goal” to exercise 20 minutes a day, so that he would not need to do any home-work before the next class. This suggested that the concept of goal setting may not translate well into Chinese.

Other diabetes education content also could not be translated appropriately. In Guangzhou, the facilitating nurse was observed discussing strategies to deal with negative emotions at diagnosis and how to control unhelpful thoughts. Although the facilitator tried to make the content relevant by discussing hypothetical cases, participants appeared uncomfortable and showed minimal interest.

Initially patients were fidgeting, then half started flipping through and burying their heads in reading materials while the other half quietly made their way out of the room in the middle of the session. (Field note from Guangzhou)

Although the observed Guangzhou program had attempted to incorporate a range of content addressing the emotional aspects of diabetes, this Westernized approach seemed to conflict with Chinese traditions of bottling-up feelings and thus this translated approach was observed to not effectively engage patients.

### *Not Meeting Patients' Needs*

Many of the Asian clinicians recruited to the study were trained overseas, in the United States or Australia. In dealing with the Asian medicalized model health care system and the behaviors of their patients, clinicians reported adapting their practice away from what they had been trained to do. While some reported trying hard to incorporate what felt right culturally, many continued to employ translated education techniques hoping that the patients would adapt. In Melbourne, many bilingual clinicians reported being disappointed by



low attendance rates at individual and group Chinese diabetes education sessions.

Over the years, we found that the attendance has dropped to the point that group would not run. It eventually died. (Melbourne interviewee B)

Patients in Hong Kong also articulated their disappointment on diabetes education in the health care system and described them as unhelpful and lacking practicality. A patient-leader in Hong Kong, who had type 1 diabetes and conducted classes for her peers, complained about clinicians:

The clinicians think they are specialists and are always arrogant. They don't have time to explore problems with patients. They need practical management strategies, not what they learn from doctors or nurses. (Hong Kong interviewee A)

### *Patients Find Their Own Ways to Manage Diabetes*

A community initiated diabetes organization in Hong Kong provided an example of patients taking charge of their own diabetes care. The founder is a community-elected patient-leader, who gathered her fellow patients and started an organization as a platform for the exchange of diabetes management experience. This organization regularly ran education classes delivered by patients, and held annual camps and social gatherings where members could learn from and support one another. The founder reported that her success was mainly due to the lack of appropriate diabetes education available to the community.

Similarly, Chinese patients in Guangzhou were seen to be adopting self-directed learning. From the brief interviews with patients at a World Diabetes Day event, patients reported that their diabetes management knowledge was gathered largely from books. One older female patient reported that she went and bought a pile of books on diabetes when she was diagnosed because she wanted to take charge of managing the condition.

### *Potential Risk in Diabetes Peer Education*

Misinformation was observed being provided to patients.

Although the patient-leader claimed to be a patient with lots of management experience, she is still not a clinician with theoretical medical knowledge. Her promotion of using high saturated fat, low sugar snack items was just not right. (Field note from Hong Kong)

Information sharing via social media was observed to promote self-appointed diabetes experts who readily circulate quick-fix remedies via smartphone apps, Chinese websites,

discussion forums, and newspaper columns. Although the culture of sharing in the Chinese community was observed to allow rapid spread of information, patients were seen to become easily overwhelmed with the volume of information. One patient from Melbourne explained that he was very glad to be able to clarify nutrition myths with a professional dietitian as it had been stressful for him to understand healthy eating from the other information sources available to him.

## **Discussion**

This research sought to explore the range of teaching approaches and cultural-tailoring elements used in diabetes educations directed at Chinese patients and determine the strategies that appeared to best address the Chinese patients' needs. The analysis of diabetes education approaches found that collective didactic education was most commonly used and clinicians adopted strategies to tailor education to individuals. Clinicians were seen to motivate behavior change with information provision and reinforcement. Participatory diabetes education models borrowed from the West did not translate appropriately and did not appear to meet patients' needs. During some observations, patients walked out of the diabetes education sessions, which was interpreted as an expression of discomfort or dislike as culturally Chinese people are less likely to challenge the educator and disrupt the class harmony (Huang & Charter, 1996). When education programs did not support behavior change patients resorted to self-education which was potentially ineffective and inaccurate.

One disturbing observation highlighted in this study was the late diagnosis and delayed intervention for type 2 diabetes in Asia, leading the health care team to take a medical treatment approach over lifestyle education to slow disease progression. This was especially surprising given evidence from other work that clearly shows how a diet and exercise can effectively sustain glycemic improvement in a Chinese population when intervention occurs early in disease progression (Li et al., 2008). In this study, it was observed that clinicians in the diabetes care system were not well-supported. With the lack of a clear framework on cultural-specific diabetes education for the Chinese patients, diabetes education was inconsistent, leaving the patients disappointed, and seeking alternative diabetes education in their own means. There is a strong need for an evidence-based Chinese-specific diabetes education framework.

Given that knowledge acquisition remains as an essential component in Chinese diabetes education, the cultural processes of their learning may require more focus in the development of effective diabetes education. Although diabetes education in the West has moved away from didactic formats (Coster & Norman, 2009), education scholars have highlighted that Chinese people, largely influenced by Confucian teaching since their youth, prefer and learn best from passive didactic teaching methods like lectures (Chow, 1995).



**Table 3.** Potential Cultural-Tailoring Strategies Identified for Different Type of Diabetes Educations and Their Explanations.

Type of diabetes education	Data source and location	Some potential strategies to improve education	Explanations supporting observed behaviors
Individual consultations	Observations in Hong Kong and Singapore	Provide prescriptive tailored meal plans to patients	Chinese people value pragmatism and direct solutions to problems, and expect practical advice from health professionals.
	Observation in Singapore	Remove goal-setting activity	Western autonomy-promoting techniques like goal setting and an active collaboration approach, do not transfer well to Chinese patients who emphasize concrete ideas rather than abstract and conceptual thinking.
Small group education sessions	Observations in Sydney and Singapore	Finish each session with a questions-and-answer section	This aligns with the Chinese cultural stepwise process of learning, allowing learners to clarify understanding and consolidate learning.
	Observation in Singapore	Empower behavioral change with detailed factual information from a well-qualified practitioner	Chinese people have a strong respect for knowledge and teaching authorities.
	Observations in Guangzhou and Sydney	Remove participatory elements, including inviting opinions in the middle of an information session	Expression of opinion and exhibiting prior knowledge are considered disruptive to class harmony.
Big group lectures	Observation in Hong Kong	Provide patient with a handbook to record individual's anthropometric, biochemical and clinical results, and direct attention to these results during education to encourage self-reflection	This allows individualization during lectures and allows reflection and identifying lifestyle modifications.
	Observation in Guangzhou	Finish education with a quiz to test knowledge	Culturally Chinese people are achievement orientated and appreciate the opportunity to demonstrate their learning.

Participatory explorative teaching methods do not fit well with the preferences in Confucian-based societies for rote learning (Thompson & Gui, 2000). Chinese may believe that learning is a gradual stepwise process progressing through memorizing, to understanding, then trying to apply knowledge, to questioning (Li, 2005). When questioning was brought forward to the start of diabetes education in this study, the learning orientation was disrupted and the patient-learners appeared frustrated and embarrassed. Experienced clinicians therefore designed questions-and-answers sections at the end of their knowledge-based lectures to better fit the cultural-specific learning process (Table 3). These learnings provide information to assist in redesigning diabetes education for the Chinese.

Furthermore, Chinese people value pragmatism and direct solutions to problems rather than reflecting on the past (Hodges & Oei, 2007), suggesting that reviewing prior knowledge and collecting diet histories were culturally inappropriate approaches. Also expression of opinions and exhibiting prior knowledge during class were considered disruptive to group harmony (Chan, 1999; Chong & Liu, 2002). Chinese patients tend to expect practical advice and useful recommendations to their problems from health professionals (Chong & Liu, 2002; Lau, 2000). A prescriptive tailored meal plan and a handbook indicating actions needed provide two examples of how such

needs can be addressed (Table 3). The heavy focus on knowledge and information observed in this study is in line with the culturally strong respect for knowledge and teaching authorities (Chan, 1999; Li, 2005). The Confucius achievement orientation (Hodges & Oei, 2007) may explain the preference for examination or quizzes as well as knowledge acquisition via self-learning observed in this study (Table 3).

It was well-recognized that diabetes education is much more than the transference of factual knowledge. Its primary goal is to facilitate healthy behavior change (Bellamy, 2004). Effective learning alone may not adequately translate to a healthier lifestyle. Well-researched Western autonomy-promoting techniques like goal setting and an active collaboration approach, however, do not transfer very well to Chinese patients who emphasize concrete ideas rather than abstract and conceptual thinking (Chan, 1999; Chong & Liu, 2002). Perhaps if Chinese patients are not challenged with foreign concepts from translated diabetes education models but were educated using more familiar prescriptively directive recommendations while also mobilizing community strengths and peer network, they might well feel more supported in their disease management and collectively adopt diabetes self-care skills.

Only one researcher collected data in the study which have led to potential misinterpretation. To reduce this, the researcher completed focused reflexivity throughout the

analysis process and a second author performed independent analysis of the data and the two discussed the findings to seek agreement. The multiple data collection methods together with analysis triangulation strengthen the interpretation. Its findings provide recommendations for some cultural-tailoring strategies for diabetes education, that if implemented at an early stage of diabetes care, may effectively reduce the burden of diabetes in the Chinese population. There is a need for further research, for example, using a randomized parallel design study to measure the glycemic impacts of a Chinese diabetes education incorporating some of the suggested strategies.

## Conclusion

This study suggests that when developing culturally appropriate diabetes education, it is inadequate to merely language translate its content and incorporate traditional diet discussion. A truly culturally appropriate Chinese diabetes education may need to incorporate Chinese traditions of learning. This may mean employing a collective passive-teaching approach with provision of prescriptive directive recommendations, with minimal participation, but allowing for individual clarification of knowledge. This information may provide clinicians with information to assist design cultural-appropriate diabetes education.

## Authors' Note

Tammie S. T. Choi was involved in project design, data collection and analysis, and drafting of this manuscript, with Claire Palermo and Karen Z. Walker supervising the process. Claire Palermo was also involved in investigator triangulation in data analysis. All authors critically reviewed the manuscript and approved the final version submitted for publication.

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**Diabetes management in a foreign land: A case study on Chinese Australians**

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Keywords: Chronic Illness Management, Culture Sensitivity, Diabetes, Health Behaviours, Migrants, Qualitative Research

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**Abstract**

The aim of this study was to understand the experience of Chinese migrants living with type 2 diabetes in Australia and explore their cultural-specific diabetes management needs, habits and expectations in the Australian context to help shape an Australian Chinese diabetes service. A case study approach was employed across different Australian cities, using participant-observations and qualitative interviews. Purposive sampling was used to find diabetes education sessions for observation and facilitators for interviews before snowball technique was used to identify more relevant clinicians. Thematic analysis with pattern matching was used for data analysis. A total of 18 participant-observations and 12 interviews were conducted. Chinese migrants appeared to experience multiple barriers in accessing the Australian diabetes care service further complicated by the mismatch between the expectations of Chinese patients and the services available. Chinese patients were observed to rely on friends for diabetes management. While health professionals appeared to be perceived as a source of reputable health information they often did not provide on-going support. When support was limited, Chinese patients were observed to adopt alternative strategies to address their diabetes, sometimes resulting in potentially detrimental health outcomes. In conclusion, redesigning diabetes care services in line with the principles of collectivism may more appropriately match the Chinese migrants' expectations and needs, and better support them in their diabetes journey.

**Keywords:** Chronic illness management, culture sensitivity, diabetes, health behaviours, migrants, qualitative research

**Bullet points**

*What is known about this topic?*

- Chinese migrants in Australia are a 'silent minority' and underutilise the diabetes care service.

- The translated diabetes education model does not match the Chinese cultural expectations of health education

*What this paper adds?*

- Chinese migrants are most likely to look to their peers for support in diabetes management.
- Health professionals are seen as a source of reputable health information but not as part of a supportive community network.
- Redesigning diabetes care services in line with collectivism may more appropriately match the Chinese migrants' expectations and needs.



## Introduction

Asians, including the Chinese, living in western countries are known to be at least 60% more likely to develop type 2 diabetes than their Caucasian counterparts (McNeely & Boyko, 2004). Despite their susceptibility to diabetes, Chinese migrants in Australia do not take advantage of access to healthcare (Choi, 2016), making them a 'silent minority' (Rawl, 1992) with this disease. Previous research has highlighted that directly translated participatory-style diabetes education based on Western models provides a distinct mismatch with Chinese cultural expectations of health education (Choi et al., 2015), potentially leading to dissatisfaction, and poor health service usage.

Health professionals can play an important role in supporting and facilitating diabetes self-management. During diabetes patient education, a health professional facilitates development of skills, knowledge and the ability to self-care, a process now considered an integral part of successful diabetes care (Colagiuri et al., 2009). Diabetes education critically supports the lifetime task of self-management for this chronic condition (Lorig & Holman, 2003). The most common reasons for culturally diverse migrants not accessing healthcare include: barriers to accessing health services (i.e. language and transport); lack of cultural understanding among health professionals; and patient factors such as poor individual health beliefs and health literacy (Caballero, 2007). Given that poor glycemic control will lead to diabetic complications and higher healthcare costs for the Australian healthcare system, it is important to understand Chinese Australians' habits and behaviour patterns in seeking diabetes self-care information and support. This will enable better allocation of resources to support diabetes management for this group.

The objective of this study was to understand the experience of Chinese migrants living with type 2 diabetes in Australia and explore their cultural-specific diabetes management habits, needs and expectations in the Australian context to help shape an Australian Chinese diabetes service.

## Methods

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3 This qualitative exploratory study employed a case study approach (Yin, 2009b), using ethnographic  
4 data collection methods including *participant-observations* and *in-depth interviews*, in March 2013  
5 to December 2014. A case study approach was chosen for its holistic and in-depth exploratory  
6 methodology in investigating casual relationships between the phenomenon and the context of  
7 environment where it occurs (Yin, 2009b). This approach provided a way of studying the diversity of  
8 Chinese Australian patients and capturing narratives of their post-migration lifestyle habits and how  
9 they impacted on diabetes management, with each case bounded by location and time. Purposive  
10 sampling (Marshall, 1996) was adopted in case identification. Across all major Australian cities,  
11 diabetes education programs and services targeted at the Chinese population were identified from  
12 online searches and via professional networks, and facilitators of these programs were contacted to  
13 invite participation. Permission was gained to conduct participant-observation of the diabetes  
14 education program/service and in-depth interviews with program facilitators. A snowball  
15 recruitment technique (Sadler et al., 2010) was also used to invite other health professionals with  
16 relevant clinical experience working with the Australian Chinese community to participate in further  
17 interviews. A total of three programs and one clinical site for individual consultation have been  
18 contacted for observation and all facilitators provided consent to participate in this study. The first  
19 author (TC) is an Australian-trained dietitian of Chinese cultural background and is fluent in  
20 Cantonese, Mandarin and English. TC was able to collect data at all field-sites from an 'emic' or  
21 insider's perspective (Liamputtong, 2009) allowing constant reference to her own cultural  
22 knowledge. The study was approved by [removed for blind peer review] ethics committee (Project  
23 no. CF12/1186– 2012000582).

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*Participant-observations:* TC blended in as a participant during diabetes education sessions while  
recording observational data (using a template) on interactions and discussions between  
participants and health professionals. This method was chosen for its systematic and naturalistic  
nature (Adler & Adler, 1988). It allowed the complexity of the diverse lived-experience of the  
diabetes journey of Chinese people to unfold, identifying patterns of behaviour they had adopted in



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3 Australia. During or immediately after these education sessions, the researcher also completed a  
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5 personal reflection log to relate observed phenomenon to her personal clinical experience. In some  
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7 observations, she adopted a *complete-participant* role (Spradley, 1980) by being the health  
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9 professional delivering the diabetes education.

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12 *In-depth interviews:* To supplement the observation data and gather narratives on patient  
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14 encounters with the health care system, health professionals involved in delivering diabetes  
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16 education to Chinese Australians, individual or group education, were invited to in-depth interviews.  
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18 Interview questions were designed to draw out patterns of Chinese Australian-specific diabetes  
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20 management beliefs and behaviours. To protect 'face' (Gao, 1998), Chinese are unlikely to speak up  
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22 about the challenges they meet when managing diabetes in a foreign land. As the Chinese self is  
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24 commonly downplayed in conversations with others who are not well known, in accordance with  
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26 Chinese social norms (Yang, 1981), the completeness of data collected via interviews with Chinese  
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28 people with diabetes could have been compromised by this restricted communication. Therefore,  
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30 interviewing Chinese Australians with diabetes was not planned as the key data source for this study.  
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32 Rather, opportunistic interviews with Chinese people with diabetes were conducted when possible  
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34 during participant-observations where sufficient trust was established between TC and participants.  
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38 Thematic analysis with pattern matching (Yin, 2009a) was adopted whereby text from each  
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40 interview transcript and observation field-notes (FN) was coded, before grouping codes into similar  
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42 concepts or themes selected to address the predetermined objectives of this study. Analysis was  
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44 assisted by QSR-Nvivo 10 (V10.0.138.0 (64bits), QSR, Australia). To enhance research rigour, both  
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46 methodological triangulation (use of interviews and observations) and investigator triangulation  
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48 were applied. A subset of data (all the FN from observed individual consultations) was analysed  
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50 independently by another author (CP). Both authors came together to discuss their independent  
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52 findings and due to similarities in analysis came to consensus easily. All interviews with health  
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54 professionals (HPs) or people with diabetes (PWD) and FNs from participant-observations were  
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originally made in Chinese then translated to English by TC. Translation was verified by an independent researcher.

## Results

A total of 18 participant-observations were conducted (Table 1), including 15 individual dietetic consultations and three group-education programs (two in Melbourne and one in Sydney). The group-education programs included outreach talks at a senior citizen community and a clinical program targeted at patients delivered in a public library. The diversity of language of delivery, group size and age range of participants provided depth and breadth to the dataset, enhancing the richness of our findings. Additionally a total of eight in-depth interviews with health professionals and four opportunistic interviews with Chinese people with diabetes were conducted. The eight health professionals included three dietitians, three diabetes nurse educators, one endocrinologist and one bilingual health educator. They worked across public and private sectors, and with range of clinical experience. Data analysis identified five major themes (Table 2).

[insert Table 1 & 2]

### *Language barrier limited access to Australian diabetes services*

Like any non-English speaking migrant population, Chinese migrants appeared to be challenged by language barriers in accessing the Australian diabetes service and managing daily lifestyle for diabetes. Chinese patients reported that despite the presence of bilingual health professionals or interpreting services at their consultation, many Chinese migrants with limited English were unable to manage the registration process. Patients also described their failure to properly understand instructions from their Australian endocrinologist and how they would buy food products from the supermarket with little knowledge of the content. After several observations, the researcher reflected,

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3 *Low English proficiency does not just limit patients in access to service and information, but it*  
4 *also makes them live in a bubble disconnected from the society. They conveniently attend a*  
5 *Chinese doctor and have a lifestyle that doesn't require use of English, e.g. buy food from*  
6 *Chinese groceries. Without the language, the usual registration process and making payment*  
7 *at reception can be stressful and become barriers to the health service. This highlights the*  
8 *inappropriateness of a translated health service hidden within the mainstream health service.*

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15 (Reflection log)  
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18 When Chinese migrants are referred to the Australian diabetes care service, it was reported that  
19 they would rely heavily on adult children to organise ringing up and booking the appointment on  
20 their behalf, providing transport to the service and translating during the consultation. Some wanted  
21 to save their children this trouble and ignored their own health or medical needs. A 77 year-old  
22 Chinese woman reported that she only went to see her General Practitioner (GP) if it was absolutely  
23 necessary as her son worked long hours in his own business and did not have the time to take her to  
24 medical appointments. She had also stopped seeing her public endocrinologist as her family did not  
25 have the time to take her to the hospital and spend hours waiting for her consultation.  
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36 *Chinese patients as a dependent within their family*  
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39 It was not uncommon, especially among Mandarin-speaking migrants who had recently arrived from  
40 China, to report that their status within their family was that of a dependent. Chinese-patients  
41 reported how they would prioritise their family members and sacrifice their own health care for the  
42 good of their family. This impacted on attendance at health professional appointments as well as on  
43 the implementation of a diabetes management plan. An 87 year-old Chinese lady told the researcher  
44 at a community talk that on her arrival in Australia she had given her daughter a small sum of money  
45 and then expected to be financially-supported by her daughter and son-in-law. She was reluctant to  
46 spend any money unnecessarily, which prevented her from attending a fee-paying appointment with  
47 Allied Health professionals when she knew that diabetes information was freely available online or  
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could be obtained from library books. Also as she was living in her daughter's household, she felt obliged to follow their rules and contribute to the family by looking after the grandchildren. This meant her medical appointments had to be planned around school pick-up times, and she did not have the time to participate in any physical activity group or a structured diabetes education program. Another 68 year-old Chinese man was in a similar situation, living with his son's family. During the observed consultation, he described the difficulties he faced in implementing the dietitian's recommendations:

*I understand the importance of dietary changes for my blood sugar control but I can't. My daughter-in-law buys the grocery and I have no control. (FN1)*

The man explained that it was not that his daughter-in-law being inflexible. Rather he felt he should not burden her by placing 'special requests' on her grocery list. He said he would prefer to keep quiet about his health needs and just eat smaller portions of the high-calorie food the family preferred, burning off the excess by increasing the length of his daily walk.

Many patients reported, sacrificing their own health needs for grandchildren's dietary preferences or family routines. Recommendations for lifestyle change were observed to be better executed when a family member was present at the diabetes consultation. The daughter of a 67 year-old male patient listened attentively to the dietitian's recommendations and said to her father,

*Don't worry about it, Dad. It is not that troublesome. We will change our dietary habits for you. (FN2)*

*Australian diabetes service was not appreciated*

Some Chinese patients also pointed out that they were unfamiliar with what can be provided by the Australian diabetes-education services and found individual diabetes service unattractive. One patient interviewee reported that since seeing an Allied Health professional for diabetes management was very uncommon in Asia, Chinese migrants usually relied on their GPs for medical

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3 and diabetes management advice. Almost all the patients seen at the observed individual dietetic  
4 consultations were referred by their GPs and reported to have little understanding of the referral  
5 reason. The interviewed Chinese patient politely said,  
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10 *Individual consultation with professionals is good but we are not used to it. In Hong Kong, we*  
11 *go to community centres to attend health talks to get health information. I like attending*  
12 *talks to learn. You listen and get information. You can ask questions at the end and listen to*  
13 *what others ask. (PWD1)*  
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19 The mismatch between the current Australian diabetes care service and Chinese patients'  
20 expectations could be a reason for poor service attendance that described by an experienced  
21 bilingual dietitian,  
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26 *Over the years, we found that the attendance [to the Chinese diabetes program] has dropped*  
27 *to the point that the program would not run. It eventually died. (HP1)*  
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31 The translated Australian diabetes education materials developed by national peak bodies  
32 commonly used during consultations were generally not appreciated by Chinese patients, as they did  
33 not find this information helpful. An interviewed health professional explained:  
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38 *Those resources are too simple. They [People who developed the material] just assume*  
39 *people with poor English also have poor health literacy, but many Chinese migrants are*  
40 *retired professionals or already read books about diabetes. They need more in-depth*  
41 *information not pictures and simplified description of diabetes. (HP 2)*  
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47 *Diabetes management information and support from network of friends*  
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50 Perhaps due to the multiple barriers to diabetes service access, Chinese migrants were seen to  
51 manage their diabetes themselves by seeking alternative diabetes information resources. Many  
52 patients were reported to obtain diabetes self-care knowledge from books, network of friends,  
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55 Australian Chinese newspaper articles and Australian Chinese radio programs. While many  
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interviewed patients reported obtaining diabetes information from written and online resources, experiences and information shared among friends was consistently described as an important source of diabetes management knowledge. Although such peer support and diabetes-information sharing was largely unstructured and informal, the strong sense of sharing in social settings was observed to be unique for the Chinese community. In the diabetes education program in Sydney, some attendees reported to have no diabetes and had taken the initiative of gathering diabetes management information as general knowledge to be shared in their social networks. Also, interestingly, in this study, a man aged 60 years, reported that he had been nominated by his church friends to seek advice from a dietitian for his diabetes, then asked to return to his group and share the diabetes management information he had collected. He claimed,

*I gather all these information from you and will go off and tell all my friends so everyone could benefit. (PWD2)*

Health professionals, in turn, were reported to be just a source of health information rather than a diabetes management partner. The obtained health information was then disseminated via word-of-mouth in the peer network which was seen to play an important role in supporting these migrants in their diabetes journey.

#### *Diabetes management patterns among Chinese Australians*

Chinese patients could become overwhelmed by the wealth of health information available. Some were observed to become fixated on health myths that might 'fix their sugar control'. For example, many patients reported trying a 'curing recipe' circulated among their peers that involved eating okra daily to optimise diabetes control. The testimonials on 'diabetes-fixing' approaches as described by peers were observed to be very convincing. Some Chinese patients strongly believed in the effectiveness of these approaches and were observed to tenaciously follow these behaviours.

Another commonly observed diabetes management pattern was to follow dietary restrictions in the hope of optimising glycemia, possibly overwhelmed by information on what food to avoid for diabetes. A 55 year-old man claimed at his first dietetic consultation that he had lost five kilograms of body weight in the three weeks since his diagnosis by cutting out all meat, all carbohydrate-based food like rice and noodles, and all foods with natural-occurring or added sugar including milk, fruit and sweet biscuits. When he saw the dietitian, he was only eating vegetables and dry biscuits, and reported persistent hunger. Although not all participants adopted such extreme dietary regimes, many Chinese patients with diabetes were observed intentionally cutting out specific foods. They exhibited a strong determination to endure any feelings of hunger and deprivation. A health professional explained during an interview,

*In Chinese culture, people with an illness would have to 戒口 ('control their mouth' / restrict their diet). Also, in China, they have a slogan for diabetes management. It is 管住嘴, 邁開腿 ('control your mouth, take more steps' / restrict your diet, increase physical activity).*  
(HP3)

Potentially as a result of the common practice of dietary restriction, many Chinese patients were observed taking multiple self-prescribed nutritional supplements to 'top-up' their diet. These supplements included multivitamins, fish oil, plant protein powders, concentrated antioxidant essences. Many believed that supplements have strong health promoting effects and, unlike medications, presented no side-effects. A 62 year-old patient from mainland China explained,

*In China, we have fake medication, with reported cases of damaging patients' liver. People generally don't trust pharmacological drugs. So [patients] just don't take [the prescribed medication]. Also there is no regulation. People who work at chemists only read the clinical effects from back of the pack and sell you the medicine.* (PWD3)

The exposure to a poorly-regulated pharmacological and medical system in China appeared to contribute to some diabetes management practices. During an observed encounter the diabetes



nurse educator pointed out that a 68 year-old Chinese lady should not be on insulin, given her optimal and stable HbA<sub>1c</sub> levels and frequent episodes of hypoglycemia. The patient later reported that she had put herself on daily insulin ever since she was found to have elevated blood glucose over 15 years ago.

Diabetes management appeared to be further complicated by the availability of Chinese Traditional Medicine. Use of Traditional Chinese Medicine and herbal remedies while also receiving Western medical treatment for diabetes was seen as common practice. Many Chinese people described how they would use Chinese herbal soups and specific ingredients like bitter melon and monk fruit, to optimise their glycemia and reduce their blood lipids and reported trust in these medicines to improve their diabetes management,

*You know, in our culture, medicine and food have the same origin. We believe food that you eat everyday will impact your health. (PWD4)*

While it is important to acknowledge Chinese traditional health beliefs and preferred source of information, clinicians report that unsupervised Chinese-self-care or self-treatment strategies can be detrimental. From their experience, these practices had resulted in undernutrition from severe dietary restrictions, nutrient toxicity from using multiple nutritional supplements, or medical emergencies from the unnecessary use of insulin.

## Discussion

This study aimed to examine the experience of Chinese migrants living with type 2 diabetes in Australia. Exploring their cultural-specific diabetes management habits, needs and expectations can then help shape an Australian Chinese diabetes service. One major finding was that Chinese patients managed their diabetes with minimal input from Australian health professionals. While this could be the result of multiple access barriers to diabetes services and the mismatch between the Australian diabetes care service and the Chinese migrants' needs and expectations, it was also apparent that



Chinese people are most likely to look to their peers for support in diabetes management. Health professionals are seen as a source of reputable health information but not as part of a supportive community network. In the absence of professional advice, Chinese patients were seen to adopt alternative strategies to address their diabetes, sometimes with potentially detrimental health outcomes.

The study draws attention to the difference between the strong collectivism of Chinese culture and the entrenched Western practice of taking an individualistic approach to diabetes management. Eastern psychology has been described as collectivistic and interdependent as opposed to the individualistic and independent psychology operating in the West (Heine, 2001). People who are from collectivistic-orientated societies place greater emphasis on interdependence within their in-groups (family and community), giving priority to the goals of their in-groups and behaving in line with the in-group norms (Triandis, 2001). The collective identity replaces the self-identity of a Chinese individual as demonstrated by the Chinese saying 犧牲小我，完成大我 (sacrifice the little self for the great self (community)), to maintain harmonious relationships and a stable hierarchical structure (Gao, 1998). Chinese patients, in this study, were observed to sacrifice their own health needs for the good of the family, including not requesting children's assistance in organising appointments with health professionals and keeping quiet about dietary needs for diabetes so as not be a burden on family members. The socially-defined self in the collectivistic-orientated community is complex and has a closer interconnection between self and others (Nilchaikovit et al., 1993) and thus the applicability of taking an individual-focus approach in self-management and autonomy-promoting patient-empowerment in diabetes care on the collectivistic-orientated Chinese should be challenged. Our findings suggest that the individualistic values of Western approaches aimed at empowering patients to take control, partnering with health professionals in decision making and being responsible for their own care (Asimakopoulou et al., 2012) can conflict with the Chinese traditional collectivistic views in decision-making and correct relationships with professionals. This suggests that the Chinese individual has to evaluate the impact of change on other in-group

members before making a decision. Also ordering of relationship by status is highly valued in collectivistic communities (The Chinese culture connection, 1987). In a hierarchical and paternalistic social structure, health professionals with expert status through training, education and experience (Kuo, 2004) are highly trusted and their recommendations should be followed unquestioningly. This might explain why Chinese patients in this study respected the health professionals and only saw the professionals as a source of information while using their peers as diabetes management partners.

People who belong to a tightly-knit social framework expect the members of their group to look after them in return for their total loyalty (Hofstede, 1983). The Chinese emphasis on sharing and collaboration suggest that peer learning would work well for this cultural group (Winter, 1996). This can be seen in our finding that in the absence of health professional support and facing the challenge of managing diabetes, the Chinese patient community in Australia created a tightly-knit peer network for collective-orientated problem-solving strategies and diabetes management information exchange. Some even focussed on supporting their peers and gathered diabetes management to be shared rather than managing their own health problems. These networks not only tap into community strengths, but also fit well with Chinese preference for an implicit support through shared activity without the recipient overtly seeking it (Kim et al., 2008). Our study also indicated that these networks can have limitations when low-quality and potentially-misleading diabetes information is shared. Nevertheless, we propose that resources in Chinese diabetes education might best be used to develop a structured train-the-trainer peer-support group instead of relying on translated education resources that do not meet community expectations. Through such platforms, health professionals could contribute reputable diabetes management information to be disseminated via word-of-mouth thus creating a supportive culturally-friendly community for Chinese Australians living with diabetes.

This study has some limitations. Firstly, despite efforts in ensuring inclusion of diabetes education sessions observed in different cities, settings and formats, diversity was limited by the few available

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2  
3 diabetes education service targeted at Chinese migrants. Although this may affect the transferability  
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5 of the findings, it also reflected the lack of available diabetes service targeted to the Chinese. As only  
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7 one researcher was involved in all data collection, the interpretation of observed events relies on a  
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9 single view even though this was deepened by the use of focussed reflexivity throughout data  
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11 collection and analysis. Investigator triangulation was also adopted to ensure a more comprehensive  
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13 interpretation of the findings.  
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16 Chinese migrants are a silent minority and underutilise the diabetes care service in Australia despite  
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18 increasing rates of type 2 diabetes. Redesigning diabetes care services in line with collectivism may  
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20 more appropriately match the Chinese migrants' expectations and needs, and truly support them in  
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22 their diabetes journey in a culturally-appropriate approach.  
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For Peer Review

Table 1: Demographics of the Chinese patients present at observed diabetes education sessions

	N (%)			
Education	Individual	Group		
Program type	15x Individual consultations	Clinical program	Outreach talk-1	Outreach talk-2
Setting	Community health clinic	Public library	Senior citizen club	Community hall
Australian city	Melbourne	Sydney	Melbourne	Melbourne
Language used for education	Cantonese or Mandarin or English	Mandarin	Cantonese	Mandarin
Total participant number	15	19	62	14
Mean age (years)	63.8	65*	70*	75*
Female gender (%)	7 (46.7)	11 (57.9)	39 (62.9)	9 (64.3)
Country of origin n (%)	6 (40)	12 (63)	2 (3)	14 (100)
China				
Hong Kong	6 (40)	4 (21)	55 (89)	
Southeast Asia (Malaysia, Singapore, Cambodia)	3 (20)	3 (16)	5 (8)	
Preferred / first language	5 (33)	15 (79)	62 (100)	14 (100)
Mandarin				
Cantonese	8 (53)	4 (21)		
English	2 (13)			

\*estimated average age

Table 2: Themes and descriptions identified that describe the experience of Chinese Australians living with diabetes

Themes	Descriptions
Language barrier limited access to Australian diabetes services	The Chinese migrants were observed to be challenged by language barriers in accessing the Australian diabetes service and managing daily lifestyle for diabetes. It was highlighted that translated service hidden within mainstream services was inaccessible to the Chinese.
Chinese patients as a dependent within their family	Many Chinese migrants described their status as dependent within their family. Their social obligations contributed to a reluctance in spending money for a fee-paying allied health service and in making special dietary requests to food providers in their family.
Australian diabetes service was not appreciated	Chinese patients found individual allied health service unattractive and reported that they preferred group-education. Many available written education resources were not meeting community needs and expectations.
Diabetes management information and support from network of friends	Without health professional support, Chinese patients were gathering information from peers, forming an informal network of support. The culture of sharing was strong.
Diabetes management patterns among Chinese Australians	Diabetes management patterns were observed to be shaped by information shared among peers, exposure to an overseas healthcare system and traditional medicine beliefs. Clinicians reported some of the unsupervised self-care practices could be harmful.



## Summary and conclusion

This qualitative case study identified Chinese patients with diabetes as a hard-to-engage community with unique learning preferences and disease management behaviours largely ill-matched with current diabetes care services. Across the seven case studies in three countries, the Chinese patients were observed to be attracted to detailed factual information from which they drew their own diabetes management plan with minimal input or open discussion with health professionals. The detailed factual information was delivered in a top-down model with innovative strategies used to facilitate individualising diabetes management plans for this group. During diabetes education targeted at individuals, Chinese patients appreciated clear prescriptive recommendations from health professionals while authority reinforcement promoted healthy lifestyle changes. Health professionals spent time and effort establishing patient trust and respect at the start of diabetes education sessions, as such trust would quickly be followed by compliance with their recommendations. While many experienced health professionals tried to culturally tailor diabetes service for the Chinese, there was a lack of standardisation and consistency. Some patients were seen taking diabetes education and management into their own hands, sometimes resulting in potentially detrimental health outcomes. In conclusion, the current diabetes care model based on Western evidence does not translate well for Chinese and a new model of care with consideration for the Chinese cultural learning orientation and preferred disease management support is needed.

# CHAPTER FIVE: SUMMARY, CONCEPTUALISATION AND PRACTICAL IMPLICATIONS

學而不思則罔，思而不學則殆

Learning without applying is a waste of effort.

## Preamble

This chapter draws together results from the systematic review and meta-analysis and the findings from the qualitative case study. It aims to provide an overarching summary to conceptualise the findings and present practical implications for diabetes education for Chinese Australians. It also aims to describe directions for future research.

## Summary of key findings

This two-part thesis aimed to examine the most effective diabetes education approach for Chinese patients; to explore behavioural patterns displayed by Chinese patients during diabetes education; and to identify the most successful education approaches. This exploratory research has been undertaken to identify an 'alternative approach' for diabetes education that is culturally tailored to meet Chinese patients' unique needs and expectations. It used two separate studies, that when analysed together, provide answers to these research questions.

The systematic literature review and meta-analysis found that the most effective approach for Chinese patients was to provide regular and continuing diabetes education, with a focus on consolidating diabetes knowledge. The qualitative case study then highlighted some distinctly different behaviour patterns displayed by Chinese patients, including passive learning behaviours and the common unquestioning acceptance of health recommendations. The qualitative study also captured the range of innovative cultural tailoring strategies of diabetes education employed by health professionals, such as employing hierarchical authority to promote healthy behaviour change and skilfully incorporating question-and-answer time at the end of education for clarifying understanding. The interpretative data analysis process in both studies has pulled together literature on Chinese patients' behaviours shaped by Confucianism and collectivism, and the Chinese cultural process of learning orientation to help make sense of the findings while informing ways to redesign diabetes education to support patient-learners. These findings suggest a range of cultural tailoring strategies for diabetes education sessions that match the cultural behaviours of the Chinese patients. Table 19 summarises the significant findings gathered from Part 1 (systematic review and meta-analysis – Chapter 3) and Part 2 (qualitative case study – Chapter 4) that appeared to work well for Chinese patients.

Table 19: Potential cultural-tailoring strategies identified for different types of diabetes education and their explanations

Type of diabetes education	Culturally tailoring strategies of diabetes education gathered from meta-analysis or case study	Chinese patients' behaviours & preferences observed from case study	Explanation from the literature supporting why the strategy might work
Both individual consultation and group education	Provide ongoing regular education*		Chinese people learn best from passive didactic teaching methods like lectures (Chow, 1995)
			A long exposure to didactic teaching may thus promote expectations of a similar didactic approach in diabetes education among Chinese (Kennedy, 2002; Wang, 2000)
		Build rapport and trust with health professionals over a long period of time <sup>#</sup>	Health professionals are regarded as 'out-group' strangers (Gao, 1998) and Chinese people tend to only open up after multiple interactions
	Provide detailed factual information from a well-qualified practitioner <sup>#</sup>	Attracted to factual information which motivates behaviour change <sup>#</sup>	Chinese people have a strong respect for knowledge and teaching authorities (Chan, 1999; Li, 2005) and very willingly take up the role of obedient listeners (Gao, 1998)
	Conclude diabetes education with examination of knowledge* <sup>#</sup>		Information reinforcement works well for keeping neural pathways active, and this relates to the typical high-achiever behaviours displayed by many Chinese learners (Kember, 2000)
			Culturally Chinese people are achievement-oriented and appreciate the opportunity to demonstrate their learning (Hodges & Oei, 2007)
	Provide close monitoring of lifestyle changes <sup>#</sup>	Motivated to change and feel responsible for health professionals' effort and time <sup>#</sup>	Health professionals are regarded as authority figures, knowledgeable and highly respected (Williams, Foo & Haarhoff, 2006) and employing the power in the hierarchical clinician-patient relationship seems to enhance treatment effectiveness
	Provide diabetes education in the community to overcome service access barriers <sup>#</sup>	Tend to sacrifice own health needs to avoid disrupting harmony in family <sup>#</sup>	The collective identity replaces the self-identity of a Chinese individual to maintain harmonious relationships and a stable hierarchical structure (Gao, 1998)
	Involve family in diabetes education <sup>#</sup>		
	Create a patient community to support diabetes management <sup>#</sup>	Display a strong sense of sharing <sup>#</sup>	Chinese people are from collectivistic-oriented societies and place greater emphasis on interdependence within their in-groups (family and community) (Triandis, 2001)

Individual consultation	Provide prescriptive tailored meal plans <sup>#</sup>	Need to be told clearly what to do and then strive for complete compliance <sup>#</sup>	Chinese tend to adopt a 'concrete-sequential' cognitive style in their learning, where learners follow educator recommendations exactly, with unquestioning acceptance and respect (Kennedy, 2002)
			Chinese people value pragmatism and direct solutions to problems (Hodges & Oei, 2007), and expect practical advice from health professionals
	Remove goal-setting activity and motivational interviewing segment <sup>*#</sup>	Perceive requirement to comply with any set of 'gold-standard' recommendations with intrinsic willpower <sup>#</sup>	Western autonomy-promoting techniques like goal setting and an active collaboration approach, do not transfer well to Chinese patients who emphasise concrete ideas rather than abstract and conceptual thinking (Chan, 1999; Chong & Liu, 2002)
			Chinese people have a strong belief that success comes from effort and willpower (Watkins & Biggs, 1996)
Group education		Reluctant to argue or raise concerns <sup>#</sup>	Chinese people constantly relate self to others, exercising self-regulatory practice to suppress personal desires (Huang & Charter, 1996)
	Finish each session with a question-and-answer section <sup>#</sup>		This aligns with the Chinese cultural stepwise process of learning (Li, 2005), allowing learners to clarify understanding and consolidate learning
	Remove participatory elements, including inviting opinions during diabetes education <sup>#</sup>		Expression of opinion and exhibiting prior knowledge are considered disruptive to class harmony (Chan, 1999; Chong & Liu, 2002)
	Provide patient with a handbook to record individual's anthropometric, biochemical and clinical results, and direct attention to these results during education to encourage self-reflection <sup>#</sup>		This also aligns with the Chinese cultural stepwise process of learning (Li, 2005) and allows individualisation during lectures and allows reflection and identifying lifestyle modifications

<sup>\*</sup>findings from systematic review and meta-analysis (Chapter 3); <sup>#</sup> findings from qualitative case study (Chapter 4)

## Conceptualisation of findings and practical implications

The findings in this thesis challenge the Western evidence-based approach, particularly the empowerment model and interpretation of person-centred care approach which has underpinned evidence-based patient education practices in recent years. This thesis not only answers the question: *if language-translation is not appropriate, how should health professionals provide diabetes care and education to Chinese patients?*; but also describes a new level of complexity and challenges to culturally tailoring diabetes education and care to the Chinese patients. This work suggests that a language-translated approach is not appropriate and that there is no one formula or recipe for cultural-tailoring diabetes education. Incorporating the practical suggestions listed in Table 19 to design various types of Chinese diabetes education could ensure better matching of service to the needs and expectations of Chinese patients. Health professionals need to adopt a new paradigm of diabetes care and education with cultural considerations to foster a systemic and coordinated change of practice.

As discussed earlier in this thesis, the person-centred care approach was found to promote mutual respect and trust between the patient and the health professional, facilitate change of behaviours and ensure compliance (Deakin, Cade, Williams & Greenwood, 2006). The movement in healthcare relationships was observed in the late 1990s, from the model of the client being a patient receiving treatment and care to one of the client being a partner taking an active role in decision-making regarding their own healthcare (Thorne & Paterson, 1998). The person-centred care approach, however, was based on the assumption that patients value autonomy and appreciate taking an active role in making self-management decisions. While this assumption aligns well with Westerners who value autonomy, independence and worldly success, it greatly conflicts with the Chinese philosophy and value-system of societal hierarchy, respect for authorities and duty to the group (Huang & Charter, 1996). It was observed throughout the qualitative case study that a teacher-centred diabetes education session was much more commonly employed and appeared to match Chinese patients' expectations. Perhaps the contrasting cultural dimensions between the West and the East explored by previous cross-cultural researchers could offer explanations to these observed phenomena. This may help address the hidden tension secondary to this cultural clash for Western-trained health professionals working with Chinese patients. Specifically, Hall (1976) and Hofstede (1984, 2010) identified societies of the West and the East (including the Chinese) displayed contrasting values including individualism vs collectivism, power distance, uncertainty avoidance and indulgence vs restraint (Table 20).

Table 20: Comparison of cultural dimensions of the West and the East and how traditional diabetes care and education may not be culturally appropriate (adapted from Hall, 1976; Hofstede, 1984, 2010)

<b>Cultural dimension</b>	<b>West</b>	<b>East</b>	<b>How traditional diabetes care and education may not be culturally appropriate</b>
Individualism vs collectivism	<ul style="list-style-type: none"> <li>- Everyone is expected to take care of themselves and their immediate family only</li> <li>- Right of privacy highly valued</li> <li>- Speaking one's mind is healthy</li> <li>- Others classified as individuals</li> <li>- Transgression of norms leads to guilt</li> <li>- Purpose of education is learning how to learn</li> <li>- Task prevails over relationship</li> </ul>	<ul style="list-style-type: none"> <li>- People are born into extended families which protect them in exchange for their loyalty</li> <li>- Stress is placed on belonging</li> <li>- Harmony should always be maintained</li> <li>- Others classified as in-group or out-group</li> <li>- Transgression of norms leads to shame</li> <li>- Purpose of education is learning how to do</li> <li>- Relationship prevails over task</li> </ul>	The popular person-centred care in the West can be criticised for its individualistic focus. Chinese people may feel uncomfortable when given autonomy in diabetes care as any decisions need to be made with consideration of their impact on collective goals to reduce disruption to general harmony.
Power distance	<ul style="list-style-type: none"> <li>- Older people are neither respected nor feared</li> <li>- Student-centred education</li> <li>- Hierarchy equated with inequality of roles, established for convenience</li> <li>- Subordinates expect to be consulted</li> </ul>	<ul style="list-style-type: none"> <li>- Older people are respected</li> <li>- Teacher-centred education</li> <li>- Hierarchy equated with existential inequality</li> <li>- Subordinates expect to be told what to do</li> </ul>	A hierarchy in diabetes education structure is expected by the Chinese patients who expect to be told what to do by health professionals.
Communication context	<ul style="list-style-type: none"> <li>- Low, with information stated directly reflecting a preference for hard, quantifiable detail</li> </ul>	<ul style="list-style-type: none"> <li>- High, with information implicitly delivered reflecting a preference to draw conclusions via intuition</li> </ul>	Collaborative discussion is not greatly appreciated by Chinese patients, who may prefer not to openly discuss their concerns.
Uncertainty avoidance	<ul style="list-style-type: none"> <li>- Comfortable with ambiguity and chaos</li> <li>- Teachers may say 'I don't know'</li> <li>- Dislike of rules</li> </ul>	<ul style="list-style-type: none"> <li>- Need for clarity and structure</li> <li>- Teachers supposed to have all the answers</li> <li>- Emotional need for rules – even if not obeyed</li> </ul>	Chinese may be less engaged with the notion of undertaking abstract conceptual thinking. They expect rules and clear recommendations from health professionals.

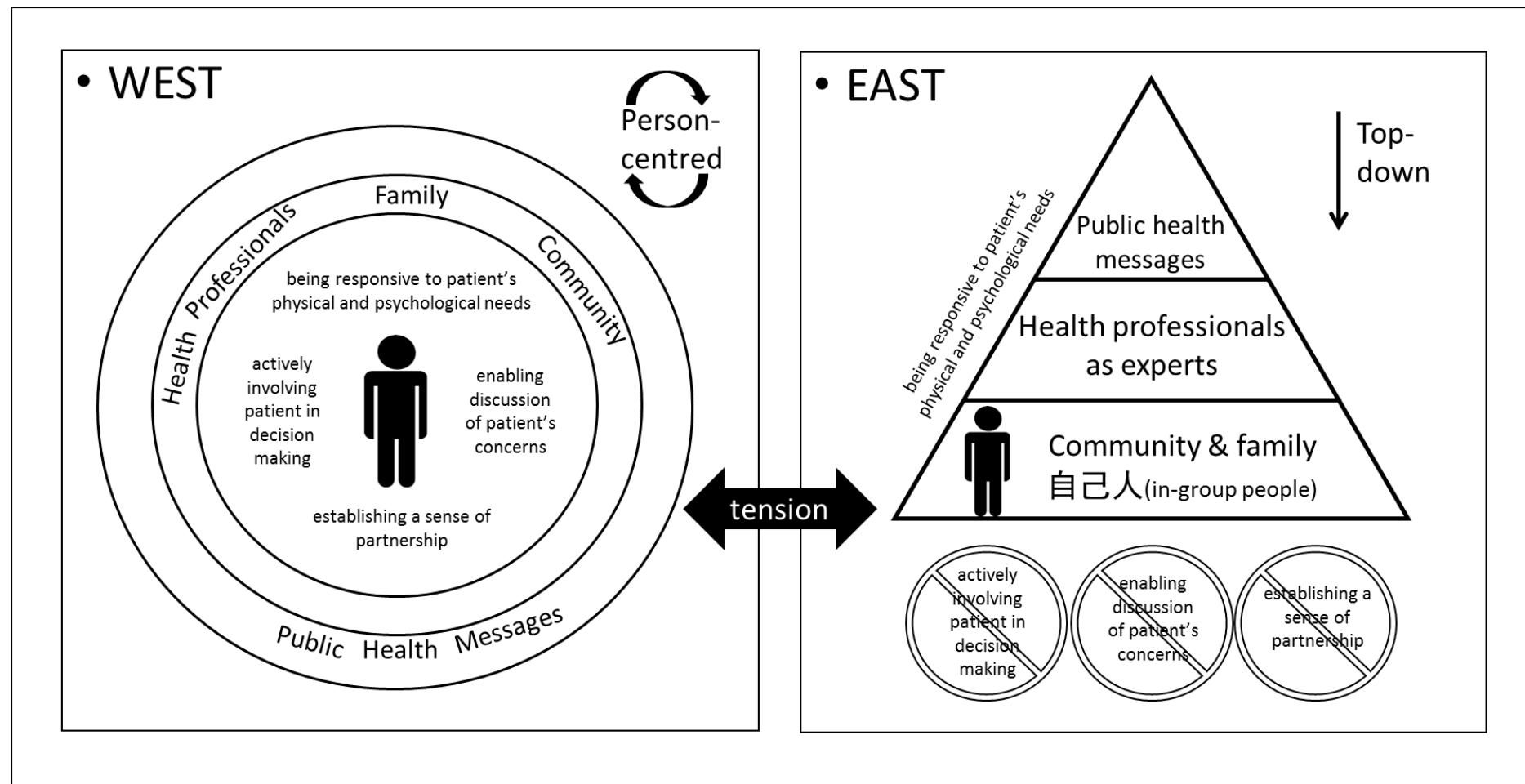
Indulgence vs restraint	<ul style="list-style-type: none"> <li>- A perception of being in control of one's own personal life</li> <li>- Freedom of speech is seen as important</li> <li>- Tolerance for some social disorder in certain defined settings</li> </ul>	<ul style="list-style-type: none"> <li>- A perception of helplessness</li> <li>- Freedom of speech is not a primary concern</li> <li>- Little tolerance for social disorder</li> </ul>	External motivators like close-monitoring by the health professionals can be effective in promoting healthy lifestyle changes.
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### *Different diabetes care models and healthcare relationships*

A new model of diabetes care and healthcare relationship is proposed for health professionals working with Chinese patients (Figure 7). Person-centred care (as discussed in Chapter 1) is about being responsive to a patient's physical and psychological needs; enabling discussion of a patient's concerns; establishing a sense of partnership; and actively involving the patient in decision-making (Bensing, 2000; Mead, Bower & Hann, 2002). In the Chinese context, however, being responsive to the patient's needs means not discussing the patient's concerns openly, it involves establishing a sense of hierarchy and providing clear prescriptive recommendations with minimal patient input. Therefore, instead of a person-centred approach, a 'top-down' hierarchical approach in diabetes care may be more appropriate for the Chinese. In the top-down approach, health professionals are seen as the experts who design health-promoting messages, provide clear scientific knowledge on diabetes management and exercise power to reinforce behaviour change in their patients. Rather than the individual focus on empowering the patient as an individual concerned with diabetes management by involving them in decision-making, Chinese patients should be seen collectively and as part of the community where support in diabetes management is sought. Thus, resources should focus on creating a patient forum for trustworthy information-exchange and peer-support within their in-group community. Although the shift of healthcare relationships may appear to be like moving backwards towards a more paternalistic role, it is arguable that it is an alignment with the Chinese concept of 各司其職 (everyone plays his role) for maintaining harmony within society. By recreating the hierarchical model of relationships in diabetes care with health professionals playing the 'diabetes expert' role and patients playing the 'obedient listener/student' role, the Chinese patient can feel supported and not challenged by a foreign individualistic-oriented person-centred approach.

Figure 7: Conceptualisation of findings – the different diabetes care models and healthcare relationships

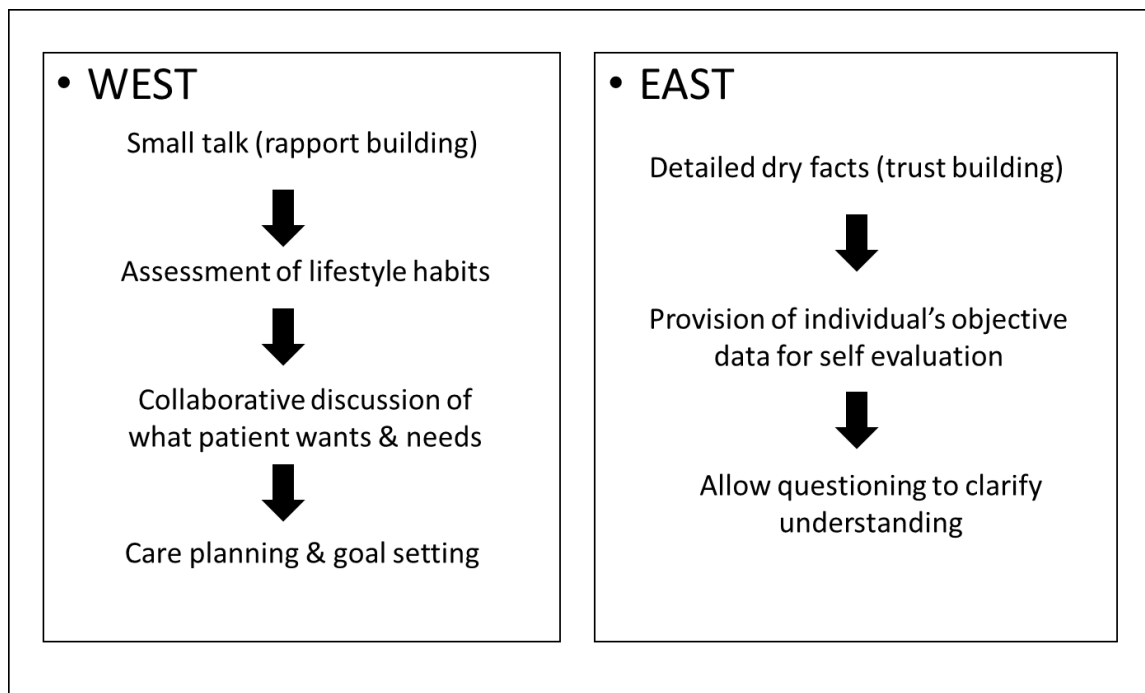


Notes:  = patient

### *The different diabetes education structure*

With adoption of this proposed alternative diabetes care model, diabetes education also needs to be restructured for Chinese patients to remove the participatory and collaborative components. Figure 8 describes how diabetes education might be structured differently for patients from the West and the East. Instead of starting the diabetes education session with small talk to build rapport and establishing a partnership between the clinician and the patient, diabetes education for a Chinese patient may begin with presentation of detailed ‘dry’ facts. This approach has been observed to be effective in building trust and reinforcing the perception of the health professional as an expert. Providing an individual’s objective clinical data while implicitly prompting the patient to draw a care-plan for him or herself (aligning with a high context communication style) may follow. Finally the session could finish off with a question-and-answer time where the patient may ask questions and clarify their understanding. This proposed diabetes education structure aligns with the Chinese cultural process of learning (discussed in Chapter 4) where learning is a gradual stepwise process progressing through memorising, to understanding, then applying the new knowledge, to questioning (Li, 2005). In this diabetes education structure, multiple sessions may be required for the slow transfer of knowledge (as discussed in Chapter 3), therefore collective education instead of individual consultation may be more efficient and less costly. This different structure for Chinese diabetes education may require a reallocation of resources and re-orientation of current clinical practice.

Figure 8: Conceptualisation of findings – diabetes education structure



### *The role of health professionals in the eyes of patients*

The role of health professionals in the eyes of patients from the West and the East is also different (Table 21). Unlike the Western approach where a partnership is established between clinician and patient where each has equal responsibility and power, the Chinese expect to look up to the clinician as a diabetes knowledge expert who will provide detailed diabetes management information and actively coach patients to make lifestyle changes. As discussed in Chapter 4, in this more paternalistic social arrangement, health professionals who have gained their expert status through training, education and experience (Kuo, 2004), are highly trusted and their recommendations are often followed unquestioningly. Chinese patients respect their health professionals and appreciate them using strategies like regular coaching and close monitoring to help improve their glycemic control.

Table 21: Conceptualisation of findings – The role of clinician through the eyes of their patients

	<b>Patients in the West</b>	<b>Patients in the East</b>
<b>Role</b>	Diabetes management partner	Diabetes knowledge expert
<b>Key duties</b>	Provides support in care planning and will actively listen to patients' needs	Provides detailed diabetes management information and actively supports patients to implement an improved lifestyle
<b>Expected tasks</b>	Negotiates individualised care plans with patients	Monitors patients regularly to ensure they execute all recommendations (like 'diabetes police')
<b>What does it mean to be a 'good clinician'?</b>	Understanding and supportive although can be time-poor	Knowledgeable and caring (will take the time to exhort (e.g., by nagging) patients to change)

### *Peer support in diabetes management*

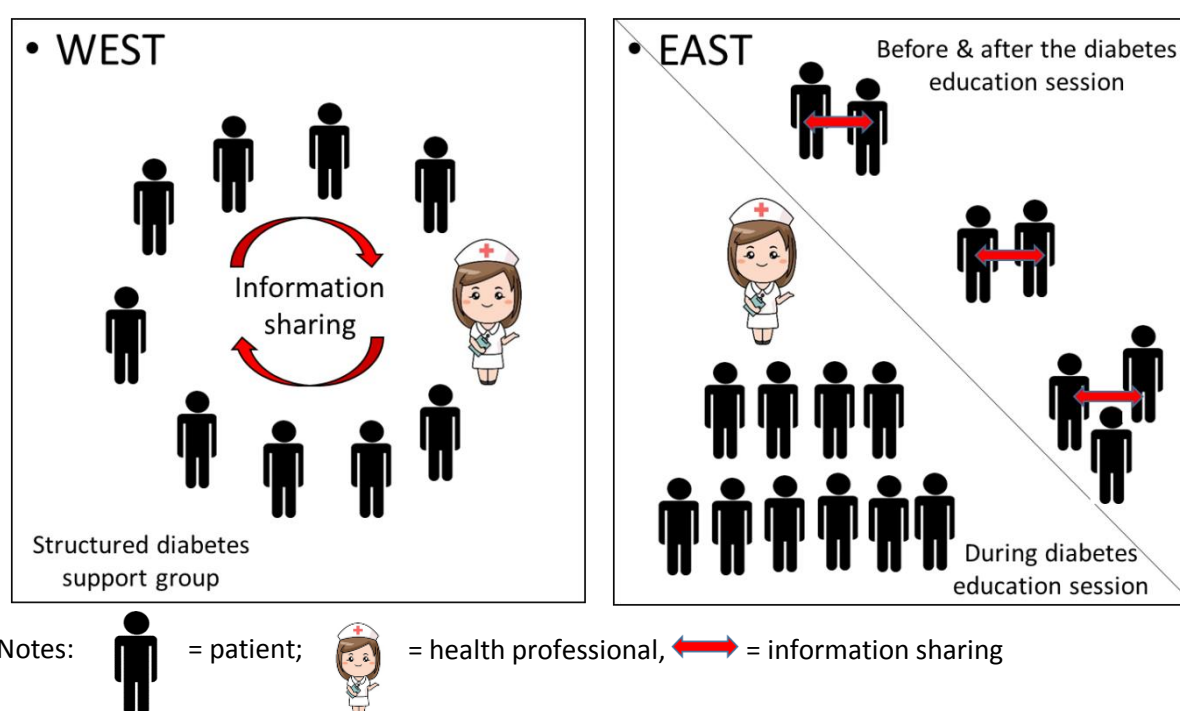
In managing diabetes, it is important to have a support network for the emotional management of the condition, as well as for information- and experience-sharing. In the hierarchical social structure of the Chinese, peer support differs from peer support in the West (Table 22). Firstly, only family and close friends are considered peers, or 'in-group people' (discussed in Chapter 4), and others, e.g., health professionals and other Chinese patients with diabetes, are seen as 'out-group people'. Information and experience are only openly shared with in-group people in an unstructured, implicit and informal manner (not in a round-table discussion). It may take up to three sessions before Chinese patients consider other patients and their clinician as peers. While the purpose of peer support for patients of the West is to provide a context for pragmatically sharing diabetes information and experience, peer support for the Chinese provides a sense of comradeship and shared experience.

This fits well with the Chinese preference for implicit support through shared activity without any need for the recipient to overtly seek such support (Kim et al., 2008). Peer support for the Chinese need not be formal or structured, but can develop as a mindful incorporation into diabetes education sessions with time put aside before and after the session, where implicit support and informal sharing between patients can grow naturally (Figure 9).

Table 22: Conceptualisation of findings – Peer support in diabetes management

	West	East
<b>Who are peers?</b>	All people (family, friends, health professionals, others with diabetes) contribute, share information, and support the patient, but the patient is autonomous	Family and close friends are ‘in-group people’, all others (e.g., health professionals, others with diabetes) are ‘out-group people’
<b>When does sharing happen?</b>	Any time or after a short ice-breaking period after meeting someone new	After the individual becomes established as an ‘in-group person’. This usually takes a long time (e.g., three diabetes education sessions)
<b>Type of support</b>	Explicit, structured	Implicit, unstructured, informal
<b>Setting</b>	Round-table discussion, e.g., a diabetes support group	Any unstructured social setting
<b>What do they look for in peer support?</b>	Sharing diabetes management experience, exchange of ideas	Sense of comradeship

Figure 9: Conceptualisation of findings – peer support setting



### *It is not a one-size-fits-all model of care*

While the top-down model discussed here was based on both results from the meta-analysis and findings of the qualitative research study, and is supported by many cultural theories, it is a generalised model and not meant to be taken as a one-size-fits-all approach for Chinese patients. As discussed in Chapter 2, the Chinese Australian population is diverse in many ways, including countries of origin, religions, political and social ideologies, education levels, level of acculturation and Westernisation, and even appreciation of the Chinese culture among sub-populations. Although 'being Chinese' could still entail sharing of a collectivistic-oriented culture shaped by Confucianism and the top-down hierarchical model of diabetes care can theoretically be applied to most Chinese patients, health professionals should be aware that the top-down model is an option of many for diabetes education. Therefore, health professionals are suggested to be conscious of the diversity of their clients, and be ready to assess their Chinese patients to determine what approach to use so that they can adopt the most appropriate mode of care. This is what it means to take a person-centred approach in working with the Chinese.

### **Conclusion**

A paradigm shift in diabetes care and education model for Chinese people with diabetes will be challenging but is a necessary step to improve health outcomes. The Chinese have a unique set of behaviours and preferences which are contrastingly different from Western populations and the current diabetes care practice based on Western evidence may be very inappropriate for them. Health professionals are urged to consider a new proposed top-down hierarchical model of diabetes care rather than the person-centred model, when providing diabetes service to Chinese patients. This may involve a reallocation of resources and a re-orientation of the role the clinician takes to educate and support their Chinese patients.

## CHAPTER SIX: THE WAY FORWARD

知者行之始，行者知之成

Gather all the knowledge then practise what you learn.

## Preamble

This is the final chapter of the thesis: based on the evidence collected in previous chapters of this thesis, it provides a possible model for the implementation of Chinese diabetes education in Australia. Suggestions are made on how diabetes-related services might be coordinated across community and primary health care settings to create a more supportive environment for diabetes care, education and self-management and improve health outcomes for Chinese Australians. This chapter also summarises how research findings may be used in clinical practice.

## A proposed model of Chinese diabetes education

The study has sought to understand the broader social and cultural values of Chinese culture to illuminate preferred patterns of learning and communicating health information for diabetes management. It also highlights the Chinese preferred system for supporting healthy behaviour adoption. The paradigm shift to a top-down hierarchical model of diabetes care and education for Chinese patients proposed in Chapter 5 addresses Chinese cultural values, beliefs and behaviours, targeting the 'deep structure' of cultural sensitivity (Resnicow et al., 1999). Culturally tailored diabetes education designed to address such inner workings of culture is not only culturally meaningful for the targeted ethnic community, but can also lead to more effective promotion of desired healthy behaviour changes (Huerta & Macario, 1999). While the proposed models of diabetes care and education discussed were built upon this research with rigorous methodologies and are also conceptually matched with the 'deep structure' of Chinese cultural values and their collectivistic orientation, they provide only a conceptual framework rather than a practice guide for clinicians. An evidence-based practice guide is needed to suggest an approach to aid translating research findings to clinical practice.

### *Wagner's Chronic Care Model in the Chinese way*

Wagner's Chronic Care Model has been used to develop a systemic and coordinated approach to the question of how to add a top-down hierarchical diabetes care model for Chinese into current Australian healthcare structures. Wagner's CCM principles (Chapter 2) have been adapted based on the evidence found in this research, to introduce various types of Chinese-tailoring strategies to each of the six elements of the CCM (Table 23). There are a few key differences in the Chinese-tailored CCM approach. Firstly, to address the perceived engagement difficulties of the Chinese patients (Chapter 4), instead of relying on the traditional approach where patients are referred into the diabetes care services via their GPs, it is suggested that clinicians should bring health information into the community encouraging Chinese patients to enter the diabetes care system from community engagement events. This approach re-orientates clinicians from the present individualistic medical model towards a more collectivistic community approach, actively bringing health information to places



where the community meets. The community setting may also facilitate the gradual building of respect and trust between Chinese patient and clinician, a process which usually takes a long time (several encounters). Furthermore, in terms of self-management support, it includes two separate but integrated diabetes educational approaches: the diabetes lecture and the forum for 'in-group people' peer support. Both align with a top-down hierarchical model and the Chinese preference for implicit diabetes management support to come from their in-group people. Finally, rather than a person-centred individual consultation, a top-down collective education approach is proposed. This should incorporate strategies to support individualising the top-down model, e.g., provision of patients' individual clinical outcomes to facilitate identification of factor to change, while monitoring them closely to reinforce change of lifestyle behaviours for optimal glycaemia.

Table 23: Wagner's Chronic Care Model adopted for Chinese healthcare (from Wagner et al., 1999)

<b>Chronic Care Model</b>	<b>Definition (Wagner et al., 1999)</b>	<b>Chinese-specific approach</b>
Health system organisation of healthcare	Plan healthcare program with measurable goals for better care of chronic illness	Plan healthcare programs with varied goals across both community and practice settings, e.g., encourage patient engagement at community level and promote measurable clinical outcomes for primary care services
Community resources and policies	Develop partnerships with community organisations that support and meet patients' needs	Develop partnerships to bring health information to the community. This should be designed to increase health knowledge within community while attracting patients into the community health service. Encourage multiple interactions between community and clinicians at the health service to allow Chinese people to gradually develop trust in their clinician
Self-management support	Emphasise a person-centred approach so that patients can manage their own care	Deliver diabetes education collectively and didactically, e.g., via a diabetes lecture, with examination of knowledge at the end of the lecture followed by close monitoring of healthy behaviour change. This aligns with a top-down hierarchical approach
		Create forums and opportunities for implicit support and informal sharing between patients, e.g., before and after education sessions; to promote a sense of comradeship
Decision support	Integrate evidence based guidelines into daily clinical practice	Integrate evidence based guidelines into daily clinical practice
Delivery system design	Focus on teamwork and expanded scope of practice for team members to support chronic care	Once patients develop trust in their clinician, incorporate a multidisciplinary approach to diabetes education by inclusion of multiple team members to support chronic care
Clinical information systems	Develop information systems based on patient populations to provide relevant client data	Develop information systems based on patient populations to provide relevant client data, and also provide objective clinical data to individual patients to facilitate self-evaluative care-planning

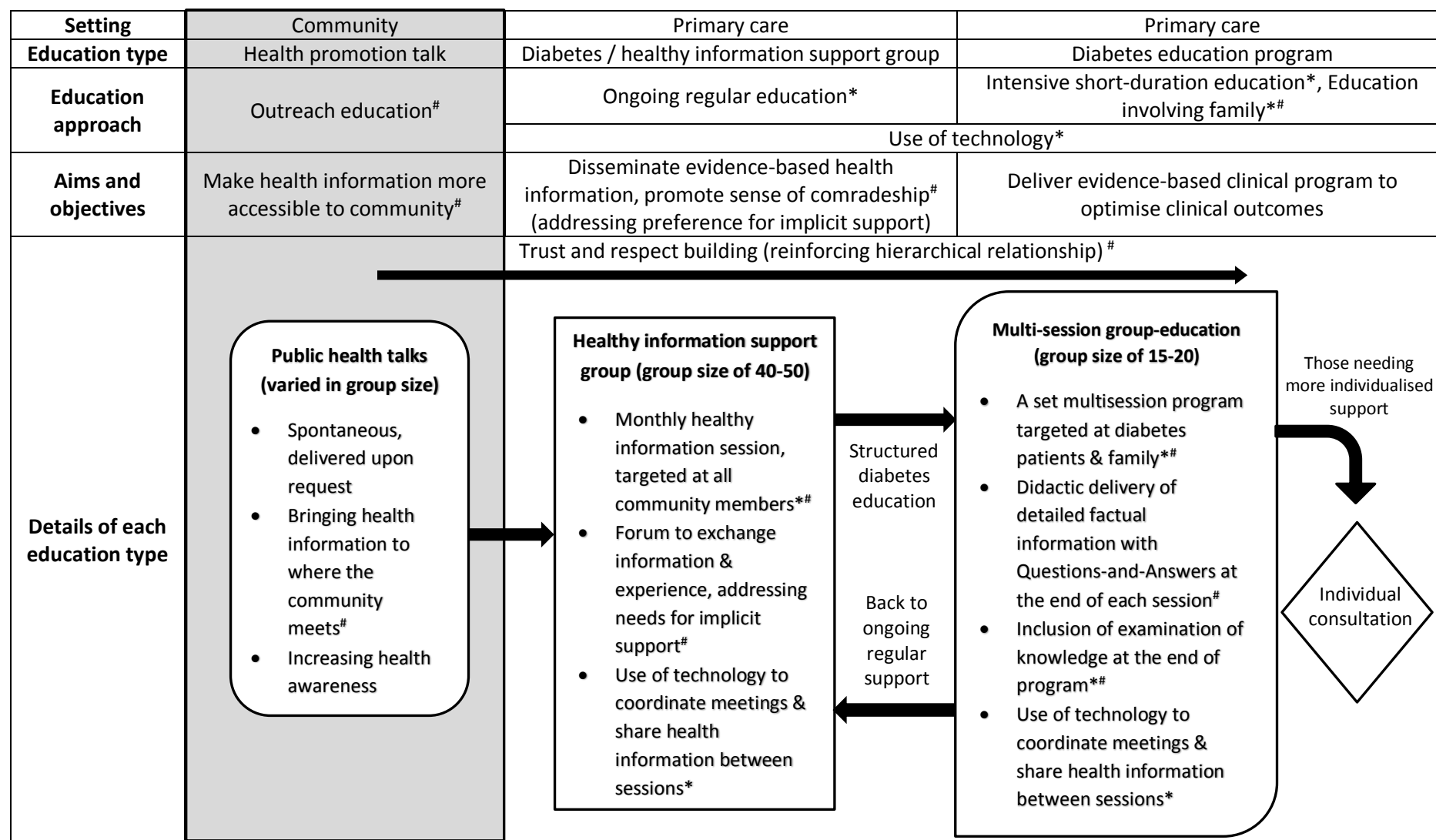
### *A two-tier implementation model of Chinese diabetes care and education*

A two-tier implementation model of Chinese diabetes care and education is suggested, linking diabetes service from the community setting to the primary care service (Figure 10). The objectives of outreach education in the community are to increase health awareness, make health information more accessible for the Chinese community and to link those needing additional support (e.g., patients with chronic conditions) into the primary care system. A healthy information support group would include a regular collective health information education session, designed to allow any Chinese community member to drop in monthly, at no cost and with no tedious registration, facilitating easy health service access (as captured by the thesis author in a community consultation project (Choi, 2015)). Each session would consist of a general health information lecture (aligning with clinicians as the experts), followed by an informal discussion forum over afternoon tea (to provide a forum for implicit peer support). This adopts the '*ongoing regular education*' approach (Chapter 3), allowing gradual uptake of health information over monthly sessions while slowly building trust and respect for the clinician. The regular session format would also provide a forum for participants to build relationships gradually with other participating patients, allowing exchange of experience and information. Finally, participants in the healthy information support group for people with diabetes can be offered a structured multi-session group-education.

This is envisaged as an evidence-based clinical program with measurable targets designed to optimise anthropometric, biochemical and clinical outcomes. This structured diabetes education program would adopt an '*intensive short-duration education*' approach which was found effective in the meta-analysis of the literature (Chapter 3) and is commonly employed in practice (Chapter 4). Also, patients participating in the structured diabetes education would be encouraged to attend the sessions with their family. This would encourage development of a more supportive home environment. This is particularly important for Chinese patients who are often enculturated to sacrifice their own health needs for harmony within the family (Chapter 4). It is proposed that structured diabetes education should be delivered collectively and didactically by a multidisciplinary team. This educational style aligns with the Confucian cultural process of learning, and can be reinforced by ending each session with Questions-and-Answers, including an examination of knowledge (verbal quiz) at the end of program. Chinese patients can also be provided with their individual clinical results to facilitate self-evaluative care-planning, and close-monitoring of healthy behaviour change. Although it conflicts with the Chinese collectivistic-orientation, individual consultation can be offered but should be given mainly to those clearly needing more individualised support, e.g., those with multiple diabetes comorbidities or other health conditions, who may require assistance in insulin titration or an individual tailored dietary plan.

This implementation model of Chinese diabetes care and education involves a strategy to effectively engage the Chinese community into the primary healthcare system they might find foreign, while incorporating culturally tailoring elements of diabetes education and support that align with Chinese preferred learning style, collectivistic orientation and cultural values. The model is very different from the usual diabetes care practices. This model suggests moving away from individualistic person-centred care approach to diabetes education for the Chinese towards a collectivistic-oriented approach.

Figure 10: Pictorial illustration of the proposed model of Chinese diabetes care, education and self-management support



\*findings from systematic review and meta-analysis (Chapter 3); <sup>#</sup> findings from qualitative case study (Chapter 4)

## Where to from here

### *An intervention to test the multi-session group-education approach*

The framework for the suggested model is based on research undertaken in this thesis and has been carefully planned to align with Chinese cultural needs and in particular to address the barriers identified in the case studies (Chapter 4). While it has promise in promoting a clinical practice change to better deliver culturally tailored diabetes education for Chinese Australian patients, a pragmatic intervention trial is also now needed to test the efficacy of a multi-session diabetes group-education program. To our knowledge, there is currently no structured diabetes education program targeted at Chinese in Australia other than occasional translated sessions; therefore, an intervention trial of the proposed Chinese diabetes education model could also address the current clinical-service gap.

A small amount of funding has been successfully granted from the Australian Diabetes Educators Association (ADEA) to test the efficacy of a culturally tailored diabetes education program for Chinese Melbournians with type 2 diabetes. (See Appendix for the acceptance letter received from the funding body) This intervention study will be conducted in partnership with Carrington Health, a primary care service located in a suburb with a high Chinese migrant population. The thesis author (TC) works clinically as a dietitian at Carrington Health. Carrington Health will provide the in-kind support of its facility and a multidisciplinary team of diabetes professionals, as well as providing resource-support for TC to conduct public health talks and run healthy information support groups while undertaking her clinical role as a dietitian. Thus, the implementation model will be examined, trialling proposed Chinese-community engagement strategies and measuring clinical effectiveness, feasibility and cultural acceptance of the culturally tailored diabetes group-education program. Additionally the delivery of this program will involve non-Chinese clinicians: namely a Caucasian diabetes nurse educator and an Italian-background podiatrist, allowing a small-scale exploration of the cultural tailoring strategies when delivered by non-Chinese clinicians. This model was believed to add valuable learnings in terms of implementation in the Australian context with very likely limited access to a Chinese multidisciplinary team. Although the intervention study is limited by its funding and will only be a pilot study, measuring pre- and post-program clinical impacts, the outcomes are expected to inform future directions for Chinese diabetes education research in Australia. The future directions could include interventions targeted at mixed Caucasian and Chinese patient-groups, and the transferability of the 'top-down model' on to the second- and third-generation English-speaking Chinese Australians.

### *Fostering adoption of the Chinese paradigm of diabetes care and education*

A paradigm shift involves a 'perceptual transformation' and is often challenging to foster. It can encounter resistance from the professional community who tend to hold tightly to the knowledge and skills learnt during professional education (Kuhn, 1970). As the person-centred care approach has been embedded into health systems since the 1990s (Bernard & Phillips, 2000) and is well-recognised as a core concept of clinical competency and practice, both worldwide (World Health Organisation, 2015) and in Australia (Colagiuri et al., 2009; Australian College of Nursing, 2014; Dietitians Association of Australia, 2015), inertia by clinicians in taking up a more paternalistic top-down hierarchical model of diabetes care for Chinese patients is expected. However, despite criticism throughout this thesis of the Western person-centred care approach and its limited transferability to the Chinese patients due to various cultural misalignments, it is arguable that the top-down hierarchical approach actually is a person-centred care approach. Looking back at the emergence of the philosophy of the person-centred care approach in 1990s, person-centred care was always about promoting the notion of individualising care for the patient, respecting his needs, preferences, values and rights, and developing good therapeutic relationships (Leplege, Gzil, Cammelli, Lefevre, Pachoud & Ville, 2007).

The individualistic lens was then added later, directing clinicians to be responsive to their patient's physical and psychological needs; facilitating discussion of their patient's concerns; establishing a sense of partnership; and actively involving the patient in decision-making (Bensing, 2000; Mead, Bower & Hann, 2002). Such Western-influenced person-centred care has an individualistic focus and does not entirely suit the collectivistic-oriented Chinese patient's cultural needs and preferences. The top-down hierarchical model may well be referred to as a person-centred approach with a collectivistic cultural lens. This perhaps is not the adoption of a new paradigm that conflicts with the person-centred approach, but an advancement of the person-centred approach that still aligns with the original principles. In order to take the first step to introduce the concept of a person-centred care approach with a collectivistic-orientation lens, a manuscript has been submitted to the *Australian Health Review*. Instead of writing an original research article, the submission to the *Australian Health Review*, will be a *Perspective* written for a *Special Issue* on teaching about health literacy. The submission is targeted at Australian health professional educators, aiming to enhance cultural competency in healthcare, addressing the unique needs of Chinese patients in learning, understanding and applying health information, and informing better ways of delivering care. The submission will be grounded in the qualitative case studies of this thesis, drawing from the conclusion some strategies on practice change.

### *Leading the change*

Finally it is well recognised that translating research into practice is difficult and one research study alone is insufficient to promote a practice change in healthcare, especially when healthcare is governed, other than rigorous evidence, by cost, profit margin, quality and efficiency (Elwyn, Frosch & Kobrin, 2016). The cross-setting implementation model (Figure 10) could post more challenges to healthcare managers who may see little results and cost-benefit from the community engagement phase in delivering public talks and conducting healthy information sessions. Patient engagement, however, is the vital step to promote a community 'buy-in' and is essential for the Chinese patients to gradually build trust and respect for the clinicians. Many interviewed Australian clinicians expressed frustration at the difficulty in providing diabetes services to the 'hard-to-engage' Chinese patient community (Chapter 4). Therefore, perhaps with more research and evidence, we can promote a change of policy on re-allocation of resources to provide what the community needs and expects. If we continue providing unappreciated translated individual diabetes education, the Chinese patients in Australia will be more likely to suffer complications from type 2 diabetes and contribute a heavier economic and clinical burden to the healthcare system. There is an opportunity to engage other primary care agencies who service the Chinese community, such as Carrington Health where managers embrace innovative ideas to promote cultural competency. This could continue build the evidence of clinical- and cost-effectiveness of the implementation model of care, and show leadership so that others will follow, to support practice change.

### *My final words...*

This thesis started because I had a 'gut feeling' that there was a cultural clash between my Chinese cultural values and the Western evidence-based patient education and behaviour change theories grounding dietetic diabetes education practices, and a perceived sense of discomfort my Chinese patients had when I engaged them in collaborative care-planning discussion during consultations. I felt incompetent as a dietitian for my fellow Chinese, and was driven by this emotional obligation to find the 'alternative approach' of diabetes education for my Chinese Australian patients.

The five-year research journey (4 years part-time, 1 year full-time) has been a transformational one for me. In this research journey, I gathered evidence on the most clinically effective diabetes education approach for the Chinese patients, identified some distinctly different behaviour patterns the Chinese patients displayed, captured the range of innovative cultural tailoring strategies of diabetes education employed by clinicians delivering diabetes care to the Chinese patients and reviewed the literature to help interpret and explain the findings. The process has drawn my attention to consider Chinese patients' behaviours shaped by Confucianism, directed me to relate the Chinese cultural process of



learning orientation to redesign diabetes education to support patient-learners, and led me to have a broader understanding of how diabetes education and management is best placed in the daily-life of Chinese Australian migrants.

The research journey has allowed me to build research skills, while enhancing my cultural understanding and appreciation of my own Chinese culture. I have learnt a great deal from immersing myself into the different cultures and speaking to more experienced diabetes clinicians during my data collection field-trips. I observed innovative Chinese-specific cultural tailoring strategies as reported in my publications, but more importantly the attitude of being a respectful clinician and putting my patients at the centre of their care. At times, I was frustrated to be challenged by clinicians who believed that 'Western is best' and my research was unnecessary. And at other times, I was annoyed with some arrogant behaviours presented by some older Chinese clinicians (due to the hierarchical culture). I also became wary of making racially-based assumptions and was reminded to be careful of stereotyping people of my own race. These are valuable lessons to draw upon for the rest of my professional life.

Now, an evidence-informed 'alternative approach' for Chinese diabetes education service has been identified. Rather than feeling task accomplished, I think this thesis has opened many doors to advocating the unique needs of the Chinese patient population, borrowing the top-down hierarchical model of care to culturally-alike patient-communities, and further enhancing culturally competent better clinical practices. As always there remains a need for further research. Testing the diabetes education model proposed in this chapter will further uncover the evidence need to improve outcomes for Chinese people with type 2 diabetes.

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## **My Research Story: From an International Student to Optimizing Diabetes Education for My Fellow Chinese Immigrants**

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**Abstract**

This case study illustrates a story of a bicultural researcher who experienced acculturation since young, later turned it around and used the multilingual skills and cultural knowledge to design a research study in optimizing diabetes education for fellow Chinese migrants. This story captures how a research question was identified from everyday clinical practice, and case study method as described by Robert K. Yin was used. In research design, particularly data collection methods, the researcher adopted unique culturally sensitive strategies to gain entry to field-sites. The researcher also described some cultural-specific challenges in collecting interview data, for readers to consider when conducting similar research.

**Learning Outcomes**

By the end of this case, students should be able to

- Gain an understanding of how research ideas could evolve from problems identified from everyday practice
- Have a better understanding of research design and theoretical underpinnings of case study research
- Understand the importance of being flexible and culturally sensitive when designing research methods and collecting data
- Learn how researcher's knowledge and experience could contribute to an ethnographic research

**Background/My Story**

I was born in Hong Kong, bred in Singapore, and trained as an accredited practicing dietitian in Australia. Growing up in the three different countries has not only equipped me with trilingual skills (Cantonese, Mandarin, and English) but also gave me an acculturative journey to reflect upon today as I share my research journey with you.

At age 12, I reluctantly departed Hong Kong in tears, leaving behind my home and friends. Before I realized it, I was confronted with the need to settle quickly into a new environment in Singapore and to make friends with children who did not even speak my Chinese language. Assimilation was a life skill to be learnt immediately. A similar, if not elevated level of, cultural challenge hit me upon arrival in Australia for my dietetics training. Although after the years I spent in Singapore, I had better English language skills, I felt limited by my lack of colloquial expressions and understanding of Australian culture. I was encouraged to overcome my *shyness* and participate in discussions in class, even though such active participation did not

seem to enhance my learning. To prepare for my dietetic clinical placement in Australian hospitals where I was required to work within a healthcare team and provide dietary advice to patients in fluent English, I was told to shed off my *Chinese-ness* quickly by not speaking Cantonese socially, by watching Australian television shows, and by eating Western meals to increase my food knowledge. So does assimilation mean washing out your original culture which defines your identity?

Interestingly, the more I was pushed to assimilate into Australian society and forgo my *Chinese-ness*, the more I felt attached to my Chinese culture. I was determined that no one deny my Chinese culture. It was perhaps this determination that motivated me to continue reading Chinese novels regularly, practice traditional customs like celebrating Chinese festivals, and maintain my Chinese diet and food preparation skills. Now looking back, I am grateful for that decision, to have preserved my *Chinese-ness* which I value and draw upon daily in both my personal and professional life as a dietitian and researcher.

I entered my working life as an Australian-trained Chinese dietitian fluent in English, Cantonese, and Mandarin. I conveniently landed myself into my first job as a community dietitian in the heart of a Chinese-migrant-populated suburb in Melbourne, Australia. My bicultural background and experience of living in Asia and Australia made me a unique health professional, with “my feet in both worlds.” I started my career as a dietitian, in part, to extend a helping hand to my own race. The fact that most of my Chinese patients like myself were foreign-born and share a common culture created an immediate bond between us. There were many occasions when I greeted my patients in Cantonese or Mandarin at the clinic reception, and I could tell from the smile on their faces that there was a feeling of warmth. When a patient reported eating 粽子 (rice dumpling) for dinner, I could save him the trouble of describing it as “a triangular dumpling made with glutinous rice and meat” and tell him instantly it was contributing to his high postprandial blood glucose level due to my intricate knowledge of Chinese food. In this role, I not only provided community dietetic services using my Chinese food knowledge in my native languages, but I also built a bridge between the Caucasian clinicians and the Chinese patients. This included providing simple translation in conversations and explaining cultural norms and behaviors for both parties. Having my feet in both worlds, I considered myself fortunate to be able to utilize my cultural knowledge in my professional work and enhance clinical practice, but more importantly, I could assist my fellow Chinese community members in living in Australia. Being a first-generation Australian after growing up in Hong Kong and Singapore, I could relate to my own experience when my patients reported feeling of isolation 背井離鄉 (being away from home) and could 舉目無親 (find no relative to turn to), and felt compelled to extend a helping hand.

As I gradually gained a status as the “Chinese dietitian” within the organization and among the referring family doctors, my Chinese Australian clientele began to grow. My clinical dietetic service turned into a Chinese-patient-focused one. As I saw more Chinese patients, I also came to realize a cultural conflict and began to question the cultural appropriateness of merely translating my dietetic knowledge and skills which were based on Western literature. During dietetic consultations in Chinese, I often found my patients behaved differently. I consistently perceived a sense of discomfort when I collected a diet history or facilitated a goal-setting activity. The Chinese patients were often reluctant to participate. I initially thought it was because I lacked the skills needed or expected from a Chinese professional (I had been attending education in English since I was 12), but deep down, I knew the approach I was taking was not effective. The more training I did on best practice in nutrition counseling, for example, taking a patient-centered approach and goal-directed care planning, the more I realized how these theoretical approaches did not align well with my culture. Culturally, we value collective compliance to instructions from authority above individual autonomy (Huang & Charter, 1996), and we prefer to communicate by “reading between the lines” rather than having an open discussion of care plans. It was then my *Chinese-ness* challenged me to think *what if the behaviorist and education theories don’t translate well to the Chinese? What if language-translating health service doesn’t meet Chinese cultural needs? And what if the translated dietetic service we have been delivering is suboptimal and, as clinicians, we had been providing a dis-service to the Chinese population all these years?* My determination to enhance quality of dietetic service to my fellow Chinese and my curiosity to explore “the alternative approach” were my pathway into research.

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#### Research Design and Methodology

I embarked my PhD research journey in the Department of Nutrition and Dietetics, Monash University in 2012, after 4 years working as a community dietitian in the Australian Chinese community. I felt that it was important to employ a naturalistic approach to understand diabetes education needs and expectations from the patients’ and experienced clinicians’ perspective. As Chinese people have a unique communication style and might be reluctant to disclose facts to outsiders even like me (Gao, 1998), I decided to not over-rely on qualitative interviews to explore needs and expectations but to observe Chinese diabetes education in various settings myself. I chose to use a qualitative case study research approach (Yin, 2009), using ethnographic data collection methods including participant-observations (Adler PA & Adler P, 1988) and qualitative interviews with clinicians and willing Chinese patients. My research aimed to explore behavioral patterns displayed by Chinese patients during diabetes education and identify the most successful education approaches from observations and stories. Although the

study was informed by various health behavior theories (theory of reasoned action (Fishbein, 1967), protection motivation theory (Beck & Frankel, 1981), self-regulation theory (Leventhal & Cameron, 1987), and the trans-theoretical model (Prochaska & Di Clemente, 1985)), I also drew on the Confucius-oriented cultural values and social expectations, particularly on learning orientation and health behaviors, when analyzing and interpreting the findings.

I adopted purposive sampling in my case identification. As I was trying to understand Australian Chinese patients' behaviors during diabetes education, I decided to trace their footsteps and collect data from these migrants' countries of origin. This also created each case to be bounded by its location and the period I spent on site in the natural environment collecting data. I was glad to find out that most Australian Chinese came from Hong Kong, China, and Southeast Asia, which matched with the various countries I spent time growing up. My existing Chinese cultural understanding and fluency in Cantonese, Mandarin, and English allowed me to collect data from an "emic" or insider's perspective (Liamputtong, 2009). This was especially important during participant-observation as I was able to pick up side-conversations among participants during diabetes education, enriching the observational information. Also my established networks in the three countries contributed greatly to gaining entry and addressing logistical issues like my relatives were providing me accommodation for the 4 weeks I spent in each data collection field-site.

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#### **Gaining Entry and Collecting Data Using Cultural-Specific Strategies**

I put my "Chinese hat" on in designing this study, including a few interesting cultural-specific strategies. For example, prior to setting off on my trips to the various Asian countries, I purchased Australian souvenirs and prepared some certificates-of-appreciation signed by the Head of Department. I knew culturally these gifts would be keys to opening doors to my research informants, and it was proven so. Some overseas clinicians began generously sharing experiences with me upon receiving my presents or after taking a photo with me on my presentation of the certificate-of-appreciation (I was later told that the photo would go onto annual reports to showcase their research involvement). Also, I was connected with the diabetes clinicians in Guangzhou, China, via my father who linked me up to a business partner who had connections with various hospitals. The system of social network in China had made entry into cases very difficult (as they had ignored all my research invitation emails), and if the clinicians had not had an established relationship with my father's business partner, I would not have been able to collect any research data in China.

Furthermore, although I had no trouble blending with participants and observing behaviors of both facilitating-clinicians and patient-participants, collection of interview data was, in contrast,



more challenging. First, although audio-recording was part of the usual qualitative interview procedure, it was not culturally appropriate. Interviewees in Asia were very reluctant to have the discussion tape-recorded as they were worried: “the recording might be used against them in the future.” This posed challenges to me as I planned to transcribe interviews verbatim and select quotes to use in presenting my findings. The rigor of my study was therefore compromised. I had to rely heavily on jotting down notes and completing extensive reflection immediately after each interview. Also, perhaps due to the Confucian-oriented hierarchical structure (Huang & Charter, 1996), many Chinese clinicians directed me to their managers for interviews as they felt they were not in the position to comment on the best strategies applied to Chinese diabetes education. Despite my effort on telling them how much I valued and hoped to capture their clinical experience, some insisted that their managers who did minimal clinical work would be better respondents for my research. Finally, potentially influenced by the Chinese cultural way of thinking (Chan, 1999), many interviewees had difficulties understanding abstract conceptual questions. For example, when I asked a clinician to describe a memory or experience that came to mind when he thinks about diabetes education service he provided to Chinese patients, the responses I got were either “I don’t know” or “this question is confusing.”

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#### **Sense-Making of Findings in Reference to Confucius**

After all the traveling for data collection and using the opportunities to meet up with old friends and family, I sat down to make sense of the data. Reflecting upon my observations, I could see a distinct pattern of learning behaviors of Chinese patients very similar to my learning preferences as a student when growing up in Hong Kong and Singapore. I then realized delivering diabetes education directed at the Chinese patients could be no different from teaching in an Asian classroom, as the element of “education” should match the typical Asian learners’ behaviors of the Chinese patients. Specifically, Chinese people tend to adopt a learning process including quietly memorizing, then understanding, then trying to apply knowledge, to questioning (Li, 2005). This could be why, from this study, diabetes education was observed to work best if it was delivered didactically at the beginning and finished with a questions-and-answers section (Choi, Walker, & Palermo, 2016). In comparison, diabetes education adopting a translated model was like forcing Chinese patients to culturally adapt to the Western participatory approach and think abstractly about their lifestyle management, thus contributing to additional stress, frustration, and anger to diabetes care (Choi, Walker, Ralston, & Palermo, 2015). I could relate this to my experience of being told to assimilate by overcoming my *shyness* and participate in discussions in class, even though such participation did not seem to enhance my learning!

At this point, I am still in the process of analyzing and interpreting my collected data. I believe I will continue to make connections with my acculturative experience to the research findings and identify “the alternative diabetes education approach” for Chinese Australians. The findings will help to inform better clinical practice, and instead of challenging our patients to adapt to the Western model, they will receive diabetes management knowledge and develop self-care skills in a more familiar and culturally appropriate manner.

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### Conclusion and Lessons Learned

As a novice researcher, while trying to learn and sharpen my research knowledge and skills, being able to utilize my cultural understanding and draw on my lived-experience in this study was a significant advantage. I learnt that when conducting and designing qualitative research, it is important to know the context of the study and choose the optimal data collection and analysis approaches. Sometimes it may involve using unique strategies that are justified to be appropriate for the context and researched population.

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### Exercises and Discussion Questions

1. When conducting research with a culturally diverse population, what do you think needs to be done prior to research design?
2. Do you think gaining entry to data collection field-sites with innovative methods could impact positively or negatively to the research?
3. What could have been done to address the issues around collecting interview data?
4. Could this research be conducted using alternative research methods?

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### Further Reading

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## Human Ethics Certificate of Approval

**Date:** 7 May 2012

**Project Number:** CF12/1186 – 2012000582

**Project Title:** Promoting lifestyle modifications for Chinese Australians with Type 2 diabetes  
(Part 1): Case Study

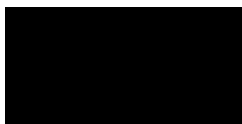
**Chief Investigator:** Ms Suet Ting (Tammie) Choi

**Approved:** From: 7 May 2012 To: 7 May 2017

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### Terms of approval

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, and a copy forwarded to MUHREC before any data collection can occur at the specified organisation. **Failure to provide permission letters to MUHREC before data collection commences is in breach of the National Statement on Ethical Conduct in Human Research and the Australian Code for the Responsible Conduct of Research.**
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 contain your project number.
6. **Amendments to the approved project (including changes in personnel):** Requires 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 Ben Canny  
Chair, MUHREC

cc: Assoc Prof Karen Walker, Dr Claire Palermo



DIABETIC  
SOCIETY OF  
SINGAPORE

HEADQUARTERS:

Blk 141 Bedok Reservoir Rd #01-1529  
Singapore 470141  
Tel: (65) 6842-3382  
Fax: (65) 6842-3118  
Website: www.diabetes.org.sg  
E-mail: ds@diabetes.org.sg

SOUTHWEST DIABETES  
EDUCATION & CARE CENTRE

Blk 528 Jurong West St. 52 #01-353  
Singapore 640528  
TEL: (65) 6564-9818 / 6554-9819  
FAX: (65) 6554-9861

CENTRAL SINGAPORE DIABETES  
EDUCATION & CARE CENTRE

Blk 22 Boon Keng Road #01-15  
Singapore 330022  
TEL: (65) 6398 0282  
FAX: (65) 6398 0275

PATRONS:

a) THE HONOURABLE MINISTER  
FOR HEALTH  
b) PROF. ARTHUR LIM

HON. FOUNDER PRESIDENT:  
DR. F. TAN BOON YAM

*Affiliated to:*  
The International  
Diabetes Federation

**Permission Letter for "Promoting Lifestyle Modifications for  
Chinese Australians with Type 2 diabetes (Part 1) – Case study research"**

1<sup>st</sup> June 2012

Tammie Choi  
Monash University  
Department of Nutrition and Dietetics  
Level 1, 264 Ferntree Gully Road,  
Notting Hill, VIC 3168,  
AUSTRALIA

Dear Ms Tammie Choi,

Thank you for your request to attend and observe the Chinese diabetes  
education program run by our organisation, and conduct interviews with our  
program facilitators for the above-named research.

I have read and understood the Explanatory Statement regarding the research  
2012000582 and hereby give permission for this research to be conducted.

Yours Sincerely,



**Mr Yong Chiang Boon  
President  
Diabetic Society of Singapore**



*The Diabetic Society of Singapore gratefully accepts donations of any amount to help "Fight Diabetes". All donations are tax-exempt.*

**Permission Letter for "Promoting Lifestyle Modifications for Chinese Australians with Type 2 diabetes (Part 1) – Case study research"**

June 29, 2012

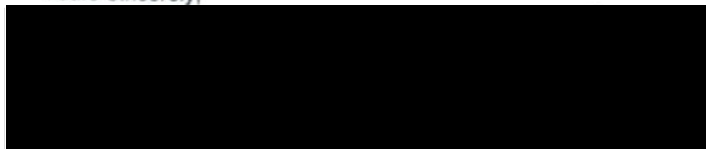
Tammie Choi  
Monash University  
Department of Nutrition and Dietetics  
Level 1, 264 Ferntree Gully Road,  
Notting Hill, VIC 3168,  
AUSTRALIA

Dear Ms Tammie Choi,

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I have read and understood the Explanatory Statement regarding the research 2012000582 and hereby give permission for this research to be conducted.

Yours Sincerely,



Professor, M.D.,  
Director,  
Division of Endocrinology,  
Nanfang Hospital of Southern Medical University,  
Guangzhou 510515,  
CHINA



---

**Permission Letter for "Promoting Lifestyle Modifications for Chinese Australians with Type 2 diabetes (Part 1) – Case study research"**

16<sup>th</sup> Oct 2012

Tammie Choi  
Monash University  
Department of Nutrition and Dietetics  
Level 1, 264 Ferntree Gully Road,  
Notting Hill, VIC 3168,  
AUSTRALIA

Dear Ms Tammie Choi,

Thank you for your request to attend and observe the Chinese diabetes education program run by our organisation, and conduct interviews with our program facilitators for the above-named research.

I have read and understood the Explanatory Statement regarding the research 2012000582 and hereby give permission for this research to be conducted.

Yours Sincerely,

A black rectangular box used to redact the signature of Kammie Yu.

Kammie Yu  
Chairperson

## Canterbury Hospital Diabetes Education

### Permission Letter for "Promoting Lifestyle Modifications for Chinese Australians with Type 2 diabetes (Part 1) – Case study research"

24 / 01/2013

Tammie Choi  
Monash University  
Department of Nutrition and Dietetics  
Level 1, 264 Ferntree Gully Road,  
Notting Hill, VIC 3168,  
AUSTRALIA

Dear Ms Tammie Choi,

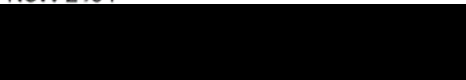
Thank you for your request to attend and observe the Chinese diabetes education program run by our organisation, and conduct interviews with our program facilitators for the above-named research.

I have read and understood the Explanatory Statement regarding the research 2012000582 and hereby give permission for this research to be conducted.

Yours Sincerely,



Diabetes Educator  
Canterbury Hospital  
Canterbury Road, Campsie  
NSW 2194





## **CASE STUDY RESEARCH PROTOCOL (Multiple-case study research)**

- **Gather information, not representative samples, not evaluating programs**

### **A. Introduction and purpose of the study**

- a. Case study question:  
How can type 2 diabetes education be culturally tailored to the Chinese Australians' unique needs to promote healthy behavioural change?
- b. Hypotheses:  
A culturally modified diabetes education program that is carefully tailored is more appropriate for Chinese people and helps to promote lifestyle changes.
- c. Propositions:
  - i. Chinese populations require an uniquely modified health education approach to promote effective self-management of diabetes
- d. Theoretical framework for the case study:
  - i. Literature review indicated that the regular ongoing education was the most commonly used and clinically promising diabetes education approach in Asia targeting at the Chinese patients with type 2 diabetes. This education model is very different from the usual Caucasian program (intensive, participatory program), that emphasises patient-empowerment and autonomy promotion. Furthermore, a translated program based on Caucasian educational theories and behavioural change principles were commented on by Chinese patients as foreign, unhelpful and disempowering. This suggested that the Chinese population requires a unique health education approach to promote effective management of diabetes.
- e. Investigator's line of inquiry:
  - i. What contributes to the uniqueness of the program?
  - ii. How is it similar to or different from the Australian evidence-based best practice group education for type 2 diabetes (which is developed based on a Caucasian population)?
  - iii. What kind of delivery model is employed? What style of education is used?
  - iv. Do the participants make lifestyle change during the program? How is the information being captured?
  - v. How is the diabetes education program evaluated? (clinical data, anthropometric data, participants' satisfaction, other survey to monitor / reflect behavioural changes)
  - vi. What additional resources are used at the session / provided to patients? (multimedia resources at the education, additional individual support, referrals to ongoing support group, newsletters, online forum, etc.) Do these additional resources contribute to the program results?
  - vii. In the broader scheme of the program: are participants connected to other diabetes services, e.g., hospital programs, community support groups

## **B. Data collection procedures**

- a. Names of sites to be visited
  - i. Singapore: Diabetes Society of Singapore
  - ii. Hong Kong: Angel of Diabetic
  - iii. Guangzhou: Nanfang Hospital group
  - iv. Beijing: Happy Life Club
  - v. Melbourne: Diabetes support group at Dutta Gulla Community Health Service, Diabetes Australia-Vic bilingual session, MonashLink Community Health Service
  - vi. Sydney: Chinese diabetes workshop at Campsie Library
  - vii. Western Australia: Diabetes Australia-WA workshops for the Chinese members
- b. Criteria for selected case (based on researchers' judgement)
  - i. Program targeted at local Chinese population with type 2 diabetes
  - ii. Delivered in Mandarin or Cantonese
  - iii. Program with a uniqueness, e.g. different delivery method, innovative activities, use of creative resources, etc.
  - iv. Contactable program facilitator
  - v. Clinically reputable as seen by
  - vi. Preferred criterion: an evaluated program
  - vii. Preferred criterion: delivered by health professional(s)
- c. Data collection plan:
  - i. Structured observation at the program & assess program against a checklist – developed from evidence-based guidelines (Best practice guideline for type 2 diabetes)
  - ii. Unstructured observation together with reflective journal after attendance of session
  - iii. Relevant program evaluation, e.g. clinical outcomes, progress evaluation
  - iv. In-depth interviews with facilitators – capture journey of program development (if possible), facilitators' perception of program impact, challenges faced in delivery/promoting self-management & lifestyle modifications
  - v. Reflective journal after each in-depth interviews
  - vi. Review documents on recruitment pathway, program design process, evaluation plan, discharge (referring out) pathways
  - vii. *Try to establish a chain of evidence*
- d. Expected preparation prior to site visits:
  - i. Make formal contacts with the organisations delivering the programs
  - ii. Identify the appropriate program that is fits included case criteria
  - iii. Provide a copy of project proposal to the contact person(s)
  - iv. Ethic approval granted for the case study
  - v. In-depth interview questions (translated) for facilitators – bring recorder
  - vi. Understanding of the organisation structure, aims, clientele
  - vii. Understanding of the healthcare system of that country
  - viii. Best practice guidelines on type 2 diabetes education in that country

**C. Post data-collection report**

- a. Local best practice guidelines
- b. Program details:
  - i. structure of the program (duration, frequency, content),
  - ii. facilitators (health professionals, medical practitioners) involved,
  - iii. resources used (manual, multimedia, guest speaker),
  - iv. demographic of the participants,
  - v. size of group,
  - vi. model of education delivery,
  - vii. the dynamic of group / participants' involvement,
  - viii. evaluation / feedback mechanism
- c. Chronology of events covering the planning, implementation and evaluation of the program at this site
- d. The theoretical model for the practice
- e. Innovativeness of the practice / program (the cultural taste)
- f. Checklist (against evidence based practice) results
- g. Qualitative results from the in-depth interviews
- h. Summary of enablers & barriers of a successful & effective program
- i. References to relevant documents / resources (websites)
- j. List of persons contacted / interviewed & number being surveyed

**D. Post-visit & report writing**

- a. Have key informants review draft case study report (if possible)
- b. Develop case study database
- c. Draw cross-case conclusions
- d. Modify theory
- e. Develop implications
- f. Write cross-case report

**CHECKLIST FOR EFFECTIVE GROUP DIABETES EDUCATION** (what makes a good diabetes education program?)

Diabetes education site / country: \_\_\_\_\_

Date: \_\_\_\_\_

Facilitated by (professional): \_\_\_\_\_

Is the diabetes education program effective?		Y/N	Comments
<b>A. Education delivery</b>			
1	Is the program delivered in primary care, hospital diabetes units, or community gathering places, e.g. church?		
2	<i>Is the program delivered by a multidisciplinary team (i.e., diabetes educators, nurses, dietitians, pharmacists, psychologists, podiatrists or physicians)?</i>		
3	Does the program employ a client-centred approach in the treatment of diabetes including medical, psychological and educational care?		
4	Is the program delivered over long periods with short follow-up?		
<b>B. Education content</b>			
1	Is the program structured to increase knowledge and understanding of diabetes, as well as promote self-management and behavioural change?		
2	Does the program employ an empowerment approach rather than a didactic approach?		
2	<i>Is the program comprehensive and include a focus on physical activity?</i>		
3	<i>Is the audience encouraged to actively participate in goal setting and decision making?</i>		
4	Is the program culturally sensitive and tailored to the needs of socio-economically disadvantaged populations?		
<b>C. Education goal / principles</b>			
1	Has the program been planned to 'optimise adjustment to living with diabetes' by promoting <i>knowledge &amp; understanding, self-determination, self-management and psychological adjustment</i> ?		
<b>D. Program exit pathways</b>			
1	<i>Is the program followed up by regular reinforcement and ongoing self-management support?</i>		
<b>E. Other relevant comments</b>			

*\*National Evidence Based Guideline for Patient Education in Type 2 Diabetes*

**DATA COLLECTION TEMPLATE FOR CASE STUDY RESEARCH (post-observation/after each session)**

Site: \_\_\_\_\_

<b>PROGRAM DETAILS:</b>	
Program description (duration, frequency, language):	
	Duration: _____ No. of session: _____
Facilitator description (number of facilitators present, discipline, ratio of participants-to-facilitator):	
Participant description (group size, age, SES, female-to-male ratio, sitting arrangement):	
Participant character & learning style (dynamic learners, imaginative learners, common-sense learners, analytic learners):	
Resource description (manual, multimedia, guest speaker):	
Content description (physiology, dietary management, physical activity):	
	How different from Caucasian program?
Environmental description (environmental factors potentially contributing to participants' behaviours e.g., limited space, rainy day):	
Session description (dynamic of the group, percentage of participation/activities, description of activities):	
Evaluation description (feedback mechanism, process evaluation, impact evaluation):	



**Certification of Documents Translated Into English**

Project Title: Promoting Lifestyle Changes for Chinese Australians with Type 2 Diabetes

I certify that the following document: (as ticked)

Random checking of in-dept interviews



Has been accurately translated into English.

Signature: \_\_\_\_\_



Date: \_\_\_\_\_

15/02/14

Ms Jia Hwa Lee  
Research Dietitian

# Reconsidering translating diabetes education – An East-Asian case study

Tammie ST Choi

When seeing a patient with limited English language skills in a diabetes education session, it is gold standard to use a professional interpreter, who forms a bridge to the conversations and provides a cultural knowledge reference at times. However, do you wonder if a perfect match of language is adequate to ensure a culturally competent service? In an Australian study, it was found that language-translated diabetes education based on Western participatory approaches resulted in a significant cultural mismatch, contributing to additional self-management stress, frustration and anger among the Chinese patients.<sup>1</sup> So, perhaps, it is time to reconsider the appropriateness of simply translating diabetes education?

## The three case studies

Being an Australian-trained bilingual bicultural dietitian seeing mostly Chinese patients with diabetes, I decided to take this on as my doctoral study to better understand the unique diabetes education needs, behaviours and expectations of Chinese patients, and to explore the best cultural tailoring strategies. I travelled to many cities in Asia and across Australia and collected qualitative data by observing diabetes education in action. I would like to share three stories to help with discussing the findings.

### Story 1: Diabetes day-camp – adapted from field notes of Hong Kong case study

I attended a diabetes day-camp in Hong Kong, running in a similar format as the type 1 camp in Australia but targeted at both type 1 and type 2 diabetes, paediatric and adult patients. It was a 6-hour event, conducted on a Sunday and attended by over 100 patients, aged from 6 to 83 years. I was surprised to find out that the whole day was filled with didactic lectures by professionals with minimal activities and interactions, other than a short tai-chi participation. I also noticed that every one-hour lecture covered detailed diabetes management facts and skilfully kept aside at least 10-15 minutes at the end for questioning.

Patient-participants were observed to be passive learners, taking notes or photographing the information slides during the lectures. I could see that it was a classroom-like setting, where students/patients sat quietly, absorbing the health information readily, before asking questions to clarify understanding. It was very different from the participatory autonomy-promoting approach we take in Australia. In fact, I was trained to move away from the didactic model in health education. Having said that, I identified the questioning at the end of each didactic lecture as a potential culturally appropriate strategy for individualising the content, allowing patient-participants to ask specific questions related to their conditions and individualise a lifestyle plan for themselves.

### Story 2: Round-table “discussion” – adapted from field notes of Singapore case study

The second observation I am sharing is from Singapore. It was a short, 2-hour diabetes education session, delivered by the diabetes nurse in a health centre. When I walked into the small room with five patients sitting around a table with a Diabetes Conversation Map™, it felt familiar. This was an approach borrowed from the West. I sat down, expecting the session to be a facilitated interactive round-table discussion. And surprisingly, this was not the case. The facilitating-nurse introduced the tool, prompted participation and invited inputs. And the five participants looked unsure and slightly uncomfortable, and reluctant to participate. They only stared at the map and looked at the facilitator, waiting to be provided with the health information. At the end of session, the nurse took everyone through a goal-setting exercise and encouraged each participating patient to set a behaviour-change goal to be completed by the following session in a fortnight. I overheard a gentleman telling his neighbour that he had set a goal to walk 20 minutes a day which he was already doing as he wanted to avoid doing homework!

Tammie ST Choi PhD candidate  
at Monash University,  
BND (Hons), APD  
PhD student/community dietitian  
Monash University



### Story 3: Knowledge promotes behaviour changes – adapted from field notes of Melbourne case study

While I was observing the didactic content-focused diabetes education sessions, I was unsure how these would promote healthy behaviour change for optimal glycemia until I attended a Chinese diabetes support group in Melbourne. I noticed similar passive learning behaviours among the group members and the lack of peer-sharing. The facilitating diabetes nurse was providing management information didactically. During the short break, I managed to speak to a few members. These Chinese patients shared their strong belief on 'knowledge is power'. One patient told me that the first thing she did at diagnosis was to buy a pile of books and read up on diabetes as she wanted to take full control of her condition. They also reported that diabetes management was simply a matter of 'being told what to do'. Once they had clear instructions, implementation was straightforward.

### Key learnings

1. Collective education was the most common diabetes education format in Asia. This suggests that Chinese patients could be more familiar with and may prefer group education.
2. Chinese patients are passive learners and prefer to sit-and-listen to clinicians rather than actively participate in diabetes education.
3. Sharing of opinion or experience was foreign to the Chinese patients, and it was not a preferred way of learning.
4. A Question-and-Answer section could be an important part of concluding didactic education, for patients to clarify understanding and consolidate knowledge.
5. Chinese patients presented with a strong attention to details and accuracy of diabetes management knowledge.

6. The wider reflective use of goal-setting did not translate well culturally.
7. Diabetes knowledge promotes healthy behaviour change for the Chinese patients. Once they had clear instructions, implementation was straightforward.

### Discussion

The findings identified that Chinese patients displayed some unique behaviours during diabetes education which are thought to be influenced by Confucianism. Confucianism has more than 2000-year history and is the major Chinese philosophy, forming the foundation of Chinese values and shaping peoples behaviours. It was found that Westerners value independence, autonomy and worldly success, while the Confucianism-orientated Chinese focus on duty to the collective group, societal hierarchy and respect for authority.<sup>2</sup>

From the observations in this study, the clinicians were seen as authority figures by the Chinese patients and their recommendations were accepted unquestioningly. Chinese patients were observed to feel entirely responsible in implementing lifestyle change and often employ self-education to learn about the condition and disease management. They tend to adopt healthy behaviours as they were told, as they probably felt that keeping themselves healthy was the duty of each citizen, to achieve harmony within the collective society. Furthermore, Chinese people also believe that learning is a gradual stepwise process progressing through memorising, to understanding, then trying to apply knowledge, to questioning.<sup>3</sup>

To support such learning process, patients appeared to expect provision of accurate and detailed diabetes management knowledge. A Questions-and-Answers section at the end of knowledge-based diabetes lectures allowed patient-participants to clarify understanding, and repeated-attendance of the information-sessions was ideal to consolidate and revise knowledge.

Moreover, participatory explorative teaching methods do not fit well with the preferences in Confucian-based societies for rote learning.<sup>4</sup> When questioning was brought forward or participation was invited prior to delivery of information, the learning orientation was disrupted and the patient-learners appeared frustrated and embarrassed.

### Conclusion & practical implications

This qualitative explorative study has commenced a process of understanding more effective approaches for diabetes education for the Chinese population. While it is too early to provide a formula to cultural tailoring of diabetes education, the findings indicated some unique health behaviours of Chinese patients, suggesting the need for an alternative approach to diabetes education in this group. Perhaps next time when you see a Chinese patient, rather than starting the session with an assessment (which involves many questions), you can try focusing on provision of detailed diabetes information, then allow the patient to check-in and ask questions to clarify understanding. Be mindful that goal-setting activities may not work well with these patients. The take-home message for diabetes educators: get to know your client group, try to understand some key learning preferences, and then design education accordingly. That is a true person-centred care.

### Acknowledgements

I would like to acknowledge my research supervisors, Dr Claire Palermo and Assoc Prof Karen Z Walker in Department of Nutrition and Dietetics, Monash University, for their research guidance into study design and methodology. I also would like to thank all participants in this study for their contribution.

### References:



MONASH  
University

Tammie Choi

**Outcome of ADEA Diabetes Research Foundation Grant Application  
[CONFIDENTIAL. Strictly embargoed until 14 November 2014]**

4 November 2016 at 11:44

Cc: Vy Le

Dear Ms Tammie ST Choi,

I am writing on behalf of the ADEA Diabetes Research Foundation Board to offer you grant funding for your project: *Pilot study on Chinese diabetes education workshop named 不再慌糖講座 ("not scared of sugar")*.

Our decision has been informed by the independent review process undertaken by the ADEA Research Council.

We would like to congratulate you on this achievement.

This offer is in confidence pending confirmation by you of your capacity to undertake the research project as submitted. In your full application, and advice to you by ADEA CEO, Dr Joanne Ramadge, that all applicants, both successful and unsuccessful, have been informed of the outcome.

We ask you to attend to the following at your earliest convenience.

1. To advise whether you remain able to accept this offer.

Please click 'Reply all' when responding to this communication and copy in Dr Joanne Ramadge and ADEA Business Development Manager, Ms Vy Le (email address above).

2. If you agree to accept our offer:

2.1 Please review the attached Funding Agreement and forward to the appropriate area of the university as required.

2.2 Please notify ADEA as soon as possible if there are any issues with the Agreement.

2.3 Please insert activities, timelines and proposed payment schedules into Schedule A on page 14 of the attached Funding Agreement for ADEA approval prior to signing by either party.

2.4 You will also be contacted by Vy who will talk with you about obtaining information for the public announcement of our grant recipients, scheduled for World Diabetes Day on 14 November 2016.  
You can also discuss how you might like to promote this good news with your colleagues and networks.

