The Video Narratives Intervention on The Self-Efficacy of Medication Understanding and Use among Post-Stroke Patients

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Abstract

Introduction: Stroke is a global burden, and self-efficacy in medication understanding and use is significantly associated with medication non-adherence related to stroke. This self-efficacy is also associated with knowledge, belief, perception, and attitude. Besides, it varies among people from different socioeconomic backgrounds and cultures. Hence, it is crucial to seek appropriate methods tailored for patients with stroke. Video narratives have shown potential improvement in medication-taking behavior related to treatment adherence among patients with chronic illness. However, those studies reflected various sample characteristics, settings, outcomes and different disease etiology. Thus there was a need to explore the video narratives impact on post-stroke in Malaysia. This thesis aimed to use video narratives as a tool to help first time diagnosed stroke patients to be self-efficacious in understanding and taking their prescribed medication appropriately. This is an effort to promote recurrent stroke prevention.

Method: This study consisted of two main phases: the development of video narratives and the randomized controlled trial (RCT). The development of video narratives involved 1) a cross-sectional study which identified factors associated with medication understanding and use self-efficacy (MUSE), 2) development and validation of scripts and video narratives, and 3) a field test to explore the feasibility and acceptability of the developed video narratives and trial procedures. Subsequently, a randomized controlled trial for 12 months was carried out on patients with stroke at the outpatient stroke clinic of Hospital Kuala Lumpur. The RCT recruited up to 216 eligible and consented patients with stroke, whereby they were then informed to return for follow-up once in three months. The patients were allocated via a randomization process to either standard patient education care of HKL (control group) or intervention with video narratives (intervention group). The patients received unbiased treatment review with prescribed medications, only obtained onsite.

Results and Discussion: A systematic review proposed that video narratives have the potential to influence on MUSE if they were incorporated with theoretical behavioral constructs. Whereas, a cross-sectional study identified significant modifiable behavioral factors associated with MUSE to be the focus of the content. Following this, video narratives of a doctor and a patient relating their stroke story was developed and validated. Their story contents, which were in the English and Malay language versions, were in line with health belief constructs and intrigued with motivation. A positive response to the engagement and qualitative feedback during the feasibility and acceptability study increased the likelihood that the video narratives would positively affect MUSE among stroke patients in the subsequent 12 months' trial. A repeated measure of MUSE mean score differences at all timelines; T0, T2, and T4 for antithrombotic, antihypertensive, and all medication indicated significant improvement ($p<0.05$) within and between groups but favored a better improvement in the intervention group. Moreover, this impact was reflected upon continuos BP control and monitoring compared to the control group. Similarly, the intervention's positive impact was also present with enhanced mean score differences 'within' and 'between' groups for BIPQ, BMQ, and SKT. Nevertheless, significant differences in all outcome measures gradually decreased between T2 and T4 for the intervention group.

Conclusion: The positive findings confirmed that video narratives incorporated with Health Belief constructs and delivered by actual storytellers in the outpatient Neurology clinic setting, were able to motivate and influence the self-efficacy of medication understanding and use among post-stroke patients.

Keywords: video narratives, Health Belief Model, medication understanding and use self-efficacy, patient education, randomized controlled trial, stroke, storytelling

General declaration

This thesis is an original work of my research and 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.

Signature: ....

Print Name: ……Jamuna Rani Appalasamy…………….

Date: ……20 May 2020………………….

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 5 original papers published in peer reviewed journals and 1 accepted manuscript. The core theme of the thesis is:The effectiveness of video narratives on the self-efficacy of medication understanding and use among post-stroke patients.

The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the School of Medicine and Health Sciences, Monash University, Malaysia under the supervision of Dr. Tha Kyi Kyi, Dr. Quek Kia Fatt and Prof. Anuar Zaini Md Zain.

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

In the case of *Chapters 1, 2, 3, 4, 5 and 6,* my contribution to the work involved the following:

Thesis Chapter	Publication Title	Status *(published, in press, accepted or returned for revision, submitted)*	Nature and % of student contribution	Co-author name(s) Nature and % of Co-author's contribution*	Co-author(s), Monash student Y/N*
1	Medication understanding and taking self-efficacy theory-based interventions: A systematic review	Published	75%. Concept, collecting data, analysis and writing first draft	Tha Kyi Kyi, Quek Kia Fatt, Anuar Zaini Md Zain, Siva Seeta Ramaiah Concept and input into manuscript 25%	No
2	Exploring post-stroke survivors' self-efficacy in understanding and taking medication and determining its associated factors: a cross-sectional study in a Neurology clinic in Malaysia	Published	75%. Concept, collecting data, analysis and writing first draft	Tha Kyi Kyi, Quek Kia Fatt, Anuar Zaini Md Zain, Siva Seeta Ramaiah, Joyce Pauline Joseph Concept and input into manuscript 25%	No
3	An Intervention to Promote Medication Understanding and Use Self-Efficacy: Design of Video Narratives for Aging Patients at Risk of Recurrent Stroke	Published	75%. Concept, collecting data, analysis and writing first draft	Tha Kyi Kyi, Quek Kia Fatt, Anuar Zaini Md Zain, Siva Seeta Ramaiah, Joyce Pauline Joseph Concept and input into manuscript 25%	No
4	The effectiveness of culturally tailored video narratives on medication understanding and use self-efficacy among stroke patients-A randomized	Published	70%. Concept, collecting data, analysis and writing first draft	Tha Kyi Kyi, Quek Kia Fatt, Anuar Zaini Md Zain, Siva Seeta Ramaiah, Joyce Pauline Joseph Concept and input into manuscript 30%	No

	controlled trial study protocol				
5	Feasibility and acceptability study of a video narratives intervention among post-stroke survivors	Published	70%. Concept, collecting data, analysis and writing first draft	Tha Kyi Kyi, Quek Kia Fatt, Anuar Zaini Md Zain, Siva Seeta Ramaiah, Joyce Pauline Joseph Concept and input into manuscript 30%	No
6	An evaluation of the video narrative technique on the self-efficacy of medication understanding and use among post-stroke patients: A randomized-controlled trial	Accepted	70%. Concept, collecting data, analysis and writing first draft	Tha Kyi Kyi, Quek Kia Fatt, Anuar Zaini Md Zain, Siva Seeta Ramaiah, Joyce Pauline Joseph Concept and input into manuscript 30%	No

**If no co-authors, leave fields blank*

I have / **have not** renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.

Student name: Jamuna Rani Appalasamy

Student signature: **Date:** 19 May 2020

I 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 name: Kyi Kyi Tha

Main Supervisor signature: **Date:** 19 May 2020

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Publications/Presentations/Awards/Grants

Peer reviewed publications

Appalasamy, JR ; Tha, KK ; Quek, KF ; Ramaiah, SS ; Joseph, JP ; Md Zain, AZ. The effectiveness of culturally tailored video narratives on medication understanding and use self-efficacy among stroke patients: A randomized controlled trial study protocol. Medicine. June 2018, Vol. 97(22), pp.e10876. PMID: 29851804, PMCID: PMC6393048. DOI:10.1097/MD.0000000000010876

Appalasamy JR, Joseph JP, Seeta Ramaiah S, Quek KF, Md Zain AZ, Tha KK. An Intervention to Promote Medication Understanding and Use Self-Efficacy: Design of Video Narratives for Aging Patients at Risk of Recurrent Stroke JMIR Aging 2019;2(1):e11539. PMID: 31518260, PMCID: PMC6715007. DOI: 10.2196/11539.

Appalasamy, J. R., Joseph, J. P., Ramaiah, S. S., Quek, K. F., Zain, A. Z. M., & Kyi tha, K. (2019). Exploring stroke survivors' self-efficacy in understanding and taking medication and determining associated factors: a cross-sectional study in a neurology clinic in Malaysia. Patient Preference and Adherence, Volume 13, 1463–1475. PMID: 31695338, PMCID: PMC6717850. DOI: 10.2147/ppa.s215271.

Appalasamy JR, Ramaiah SS, Quek KF, Zain AZM, Tha KK. Medication Understanding and Taking Self-Efficacy Theory-Based Interventions. Journal of Young Pharmacists. 2020; 12(1):18–24.

Appalasamy JR, Joseph JP, Seeta Ramaiah S, et al. Video Narratives Intervention Among Stroke Survivors: Feasibility and Acceptability Study of a Randomized Controlled Trial. JMIR Aging. 2020 Jul;3(2):e17182. DOI: 10.2196/17182.

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Oral poster presentations

Narratives as a technique to improve medication understanding and use self-efficacy in stroke: content development using the modified Delphi method.

(The 4th European Stroke Organisation Conference (ESOC 2018), May 16-18, Gothenburg, Sweden)

Authors: Appalasamy JR, Tha KK, Quek KF, Ramaiah SS, Joseph JP, Zain AZM

Video narratives: Promoting medication understanding and use self-efficacy among stroke patients

Asian Oceanian Myology Centre –Malaysian Society of Neuroscience (AOMC-MSN XVII)The 17th Annual Scientific

Meeting, July 27-29, 2018 Venue: Kuala Lumpur)

Authors: Appalasamy JR, Tha KK, Quek KF, Ramaiah SS, Joseph JP, Zain AZM

Factors influencing medication understanding and use self-efficacy among stroke patients: A qualitative exploration

Poster Presentation Competition, HKL Research Day 2018 (30th of August 2018)

Authors: Appalasamy JR, Tha KK, Quek KF, Ramaiah SS, Joseph JP, Zain AZM

E-Poster

Audio-visual narratives as a mean of communication in promoting medication understanding and use self-efficacy among stroke patients: The development and evaluation

4th International Conference on Neurological Disorders & Stroke, July 09-10, 2018, Sydney

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List of Figures

Note: All other figures, tables, links and appendices are embedded within published papers and do not appear in this list

List of Abbreviations

ANZCTR	Australian New Zealand Clinical Trials Registry
BIPQ	Brief Illness Perception Questionnaire
BMQ	Belief About Medicine Questionnaire
BP	Blood pressure
CVD	Cardiovascular disease
HBM	Health Belief Model
HKL	Hospital Kuala Lumpur
IMB	Information-Motivation-Behavior
MREC	Medical Research and Ethics Committee
MTAC	Medication Therapy Adherence Clinic
MUHREC	Monash University Human Research Ethics Committee
MUSE	Medication Understanding and Use Self-efficacy
NCCSDO	National Coordinating Centre for Service Delivery and Organisation
SF-36	Short Form (36) Health Survey
SKT	Stroke Knowledge Test
SMS	Short Messaging Service
SPIRIT	Standard Protocol Items: Recommendations for Interventional Trials
T0	0 month; baseline
T1	3rd month from baseline
T2	6th month from baseline
T3	9th month from baseline
T4	12th month from baseline
TIA	Transient ischemic attack
UTN	Universal Trial Number

"People not only gain understanding through reflection, they evaluate and alter their own thinking."

"Gaining insight into one's underlying motives, it seems, is more like a belief conversion than a self-discovery process."

Social Foundations of Thought and Action: A Social Cognitive Theory, 1986

Foreword

Medication understanding and use self-efficacy (MUSE) is a vital component of medication adherence and the medication-taking behavior towards stroke risk factor control. About 50% of post-stroke patients lack MUSE, which coexists with medication non-adherence. Despite having medication therapy adherence clinics (MTAC), the patient education effort for stroke prevention in Malaysia still experiences huge challenges. Our research work builds on the knowledge that self-efficacy is a modifiable behavioral factor responsible for steering an individual's action. It is understandable that perception, belief, motivation, and self-efficacy are inseparable entities as they are interdependent with one another. Hence, the aim was to influence these associations via an intervention to assist MTAC to enhance the self-efficacy of understanding and taking stroke preventative medication. From our conceptual framework's point of view, enhancing MUSE would also trigger other self-care actions such as self-monitoring and stroke risk factor management. Therefore, it was a call for a challenge to shift deep-rooted attitudes towards new behavioural adaptation.

Video narratives are a potential tool to assist in patient education. Thus, this study intended to test if video narratives as an intervention would be able to enhance MUSE among patients with stroke. Therefore, this thesis describes the study phases (step-by-step procedures) of the video narratives development towards a randomized controlled trial based on our research question and theoretical, conceptual model. More specifically, we anticipated that integrating video narratives during the actual outpatient stroke clinic appointments would result in significant MUSE improvement compared to the standard outpatient clinical care.

This thesis gave us an opportunity to help post-stroke patients to be confident self-learners; to gain knowledge and positive illness perception and belief that their medications were given based on benefit versus risk ratio. Particularly, to gain self-efficacy in understanding the purpose of their stroke treatment and be responsible in taking the prescribed stroke preventative medication appropriately. In the long run, we believe they would be able to sustain their effort to monitor and control stroke risk factors towards the prevention of recurrent stroke. We hope that our strategies and methodology could set a way towards more personalized innovations in stroke research in Malaysia.

This is a PhD thesis by publication. Six related original papers that have been published, accepted, or submitted in reputable, peer-reviewed journals, build the core chapters. The chapters begin with the introduction (Chapter 1), which then progresses towards the development and evaluation processes (Chapters 2 to 5). All chapters are then bound-completed with the conclusion chapter (Chapter 7). Every chapter has a preamble that links the previous chapter and ends with a summary to ease the flow, comprehension, and continuity of the thesis.

Chapter 1: Describes the background and rationale of undertaking this study. The problem statement was defined specifically with a small disclosure on the preliminary works and a systematic review that identified research gaps. Henceforth, the aim of the intervention is elaborated with a theoretical and conceptual framework.

Chapter 2: Identifies modifiable factors associated with MUSE among post-stroke patients in Malaysia via a cross-sectional study. This step is crucial to help us understand the patients' needs and, therefore, able to develop purposeful video narratives contents related to the identified factors.

Chapter 3: The findings from Chapter 2 directs to the development of personalized video contents. This chapter describes the discussion processes among a panel of experts through several rounds of the Delphi method. This section also elaborates on the video engagement and comprehension procedures pertinent to the targeted patient population.

Chapter 4: Subsequently, this following chapter establishes the workflow of a randomized clinical trial (RCT) for one year, which explicitly describes the appropriate methods and analysis in detail to test the effect of video narratives on MUSE among post-stroke patients compared to those provided with only standard care at HKL.

Chapter 5: The RCT is established for its applicability via a feasibility and acceptability study. This chapter addresses the potential challenges of the intervention methods and data collection procedures in terms of patient recruitment and workflow adaptation as per the trial protocol.

Chapter 6: This chapter determines the impact of the video narratives on several outcomes, specifically on MUSE. This section concludes the key findings with a discussion on the implications of the intervention related to sustainability in an actual setting and the limitations this our research. This chapter summarises with a short disclosure of the future direction of the research.

Chapter 7: This is the thesis conclusion, which states the final remarks on the knowledge gap filled and gained in this specific field of research.

CHAPTER 1:Overview of stroke and its medication related needs

Introduction

1.1 Background: The stroke burden

The prevalence of stroke estimated to be 0.7 % in Malaysia. The mean age of stroke varies between 54.5 and 62.6 years [1-3]. However in one study, the mean age of Malaysian stroke patients was reported to be 41.5±8.8 years [4]. About 40,000 acute stroke cases are reported per annum, and about 23% of stroke hospitalizations are related to risk factors of recurrent stroke [2]. Stroke has critical limitations on physical, psychological, and social activity [5]. Severe stroke causes loss of mobility, which causes patients to experience the isolation of work and societal activities, which in the long run, increases the risk of depression and worsens their quality of life [5, 6]. It is estimated that approximately 35% of those who have experienced a transient ischaemic attack (TIA) will subsequently have a stroke recurrence within several weeks or months [2]. For those patients who were hospitalized, only 13% of them were able to recover after much assistance; meanwhile, the rest needed ambulation assistance of varying degrees. Nevertheless, at three months post-attack, only 82% of the acute cases showed improvement [7, 8]. To make the condition worse, 33% of these acute strokes end with distinct degrees of disability ranging from moderate to severe, in addition to high mortality and morbidity rate among the aging population [2]. The commonest stroke risk factors are; hypertension (53.2–76.1%), followed by diabetes mellitus (27.4–55.2%) and hyperlipidemia (4.8–37.3%). Smoking has also contributed as a stroke risk factor (19.4–37.3%), followed after by ischemic heart disease (10.4–35.5%) and a history of TIA (7.5–25.1%) [3, 9-14]. Nevertheless, stroke prevalence is not exempted from one more contributing factor, 'the medication nonadherence' [15]. Concerning stroke, apart from being complicated with severe risks to cognitive functionality, sanity, and physical ability, stroke management is also daunted by suboptimal medication compliance [16]. Nonadherence to prescribed stroke preventative medications contributed to about 38% of the prevalence of stroke in Malaysia [3]. Hence, there is a definite necessity to curb medication nonadherence issues among post-stroke patients in Malaysia.

Literature Review

1.2 Medication adherence; a unique medication taking behaviour trait

Adherence to prescribed medication is well-defined as a magnitude of a patient to continue his prescribed medication to a certain degree, accepted and agreed by both the prescriber and patient [13, 14]. Hence, medication adherence is very much related to medication-taking behavior. In fact, medication adherence is a unique medication-taking behavior trait that differs between individuals [17]. The National Coordinating Centre for Service Delivery and Organisation (NCCSDO) has defined medication-taking behavior as an observation of variable human behavior characteristics to adhere to treatment by prescribers. It is influenced by interactions with the healthcare provider or by societal-policies and practice [15]. Thus, prescribers view nonadherence as a confusing and frustrating issue. However, it is viewed differently by patients, in which patients' actions or attitude towards health depend on individual opinions, understandings and importance, including concerns about side effects of medication, seems to be rational [15].

Medication understanding and use behavior leading to nonadherence are therefore dependable on the personal justification of treatment and disease. The patient actively decides to stop taking their medications at the beginning or during various stages of their treatment phase. Nevertheless, in certain circumstances, all these thoughts and medication-taking actions are influenced by patients' physical, socioeconomic, and cognitive capability in continuing the medication regimen [18, 19].

1.3 Patient education as a strategic measure in stroke medication non-adherence

The stroke burden in Malaysia has led to the adaptation of the Medication Therapy Adherence Clinic (MTAC) framework to assist post-stroke patient care in outpatient clinics [20]. The patient education, as the aim of MTAC, identifies modifiable individual behavioral factors and addresses their underlying problems. So far, there are limited references to its efficacy in terms of motivation and self-efficacy. There was also another community-level effort via stroke information website. It was to encourage public responsiveness to detect stroke symptoms and enhance stroke awareness [21].

However, the effort was too generalized to tap into the needs of a specific post-stroke niche.

Overall, patient education is a vital effort by healthcare professionals to help patients in enhancing knowledge to act on decision making. It helps to manage the negative perception of illness and therapeutic procedures and improves patients' medication self-management and independence in lifestyle challenges. Patient education is also needed, as poor health literacy is consistently associated with hospitalizations and poor medication-taking behavior [22]. Therefore, patient education could be the best platform for improving post-stroke patients' awareness and improving disease outcomes [2, 20, 23]. Nonetheless, in reality, patient education would only be successful if the patients develop motivation and are proactive in using their gained knowledge and resources into practice.

1.4 Medication belief; an integral necessity of medication taking behaviour

Differentiation between individuals is due to various modifiable factors and non-modifiable factors. Culture, economic background of the community, type of disease, and the literacy rate of the society are categorized as non-modifiable factors. However, it is possible for a change to healthcare providers, but it would need a holistic organizational effort and tremendous research time. Whereas, behavior traits such as perception and attitude (as modifiable factors), although rigid to a certain extent, could be influenced by individualized effort and self-learning methods; however, the sustainability of the mind-set depends on those non- modifiable factors [19, 24-26].

According to the Necessity and Concerns framework, the patients' belief is built on the individual rational judgments involving perceptions, needs for the treatment, and interest of potential side effects of prescribed medicines [27]. A recent meta-analysis done on eighteen studies supported the concept of medication beliefs as an integral part of 'The Self-Regulation of Illness' theory [28]. The disparity of belief about prescribed medication is very much affected by media information misinterpretation, low awareness of the medical benefit, and abundance of alternative medication. It is a growing trend that patients pursue various treatment practices without seeking advice from their prescribers [29]. Therefore, it is a norm whereby patients meet various health practitioners when they do not 'feel' results within their perceived 'healing time'. Thus, the actions taken by one towards their health care situation and the desire to achieve it depend very much on the individual self-efficacy and motivation. Apart from that, cultural variations such as language differences among patients, society, or country predominantly influence the belief about the disease. Furthermore, the patients' family and society's influence, knowledge about the disease, prescriber's belief, and confidence about the treatment and delivery system of the medication eventually develop specific individual attitudes towards recovery and the meaning of quality of life [30].

1.5 Self-efficacy; a fundamental construct of 'The Social Cognitive Theory'

"The Social Cognitive theory" defines the 'self-efficacy' as an individual's belief in his or her ability to accomplish a task as a perceived success for a specific situation [31]. The theory explains that people with high self-efficacy believe they can perform and master challenges well [32]. It is proven that patients with enhanced self-efficacy perform better in terms of skills development and self-care disease management compared to their counterparts [32]. The patients' experience influences self-efficacy. Motivation steers their rate of success or failure of a skill that needs to be mastered. Therefore, encouragement also leads to higher self-efficacy [32] Also, researchers observed that people with higher self-efficacy make efforts to complete their tasks for their betterment. In other words, high self-efficacy equals high self-motivation. Hence, ones' strength of perceived self-efficacy is an assurance towards seeing their challenge to be mastered or seen as a threat.

1.5.1 Perceived self-efficacy; predicts the intention of behaviour change

Choices affecting health and medication-taking behaviour such as smoking, physical exercise, dieting, self-monitoring, medication self-management depend on the self-efficacy [33]. Various health care models or campaigns indicated self-efficacy perception or belief as an outcome measure to predict the illness risk factor control [34-37].

Therefore, perceived self-efficacy is also a determinant of medication adherence [38]. Taking medicine as coordinated is the patient's obligation; nonetheless, if the patient has inadequate experience of not seeing how to take medicine appropriately, medication abuse or non-adherence is not an astounding outcome. This severe issue of misunderstanding and use of prescribed medication drives us to not only focus on the demonstration of taking the medication but also focusing on its predecessor of that demonstration— the patients' comprehension and reasoning of taking the medication.

1.6 Medication understanding and use self-efficacy (MUSE); a post-stroke need

There is increasing evidence for the need for self-efficacy in high-risk illnesses such as stroke. Patients with stroke and with enhanced self-efficacy do better in coping with the challenges of daily activities compared to those with stroke and have low self-efficacy [39]. Being self-efficacious help post-stroke patients to gain confidence and independence to manage and make the important decision about their illness [40]. The following section describes preliminary findings of a previous work that initiated this study; while bearing in mind the relationship between self-efficacy, medication-taking behavior, and medication non-adherence.

The recent qualitative study explored the needs and barriers of local post-stroke patients in Malaysia, which has identified self-efficacy as the core issue of medication-taking behavior [41]. It is not a surprising discovery as self-efficacy has been researched for more than a decade. However, the preliminary findings confirmed the existence that post-stroke patients lack self-efficacy in understanding and use of medication, which could be a potential factor towards medication non-adherence. The major themes were related to low self-efficacy in understanding the importance of stroke preventative medication and the lack of taking the prescribed medication appropriately. A selective group of patients needed encouragement to change their laid-back attitude to be proactive and independent and to perceive the positive benefits of stroke's preventative treatment despite being knowledgeable about stroke. There was also a need for recurrent stroke awareness among those with low health literacy. Nevertheless, the findings suggest that all individuals had various self-efficacy levels influenced by perception and belief. Apart from that, most of the patients desired emotional support and motivation to overcome barriers. There is mounting evidence that self-efficacy outcome-based interventions have a positive stimulus on chronic illness [40,42]. However, limited innovations are at grasp involving personalized interventions that could improve or modify medication-taking behavior related to self-efficacy, especially among those with various underlying comorbidities leading to stroke.

1.7 The impact of self-efficacy construct based strategies in stroke and its risk factors; an overview

Health behavior theories have contributed to advance research to test innovative intervention strategies to improve medication-taking behavior [43]. One example is the Health belief theory; developed in 1966, has played a substantial role in predicting the nature of disease outcome [44,45]. Another study [46] showed that 22% variance in medication adherence among chronic illness patients was caused by health-belief effects rather than clinical or sociodemographic variables. Hence, medication non-adherence related to self-efficacy depends on the perception towards the illness and medication and the motivation of being adherent.

1.7.1 Medication understanding and taking self-efficacy theory-based interventions: A systematic review

A systematic review that explored the effectiveness of health-behavior theory-based interventions [47] presented a significant ground effect on intervention designs. Nonetheless, these interventions were delivered based on the feasibility and acceptability of study designs and various outcomes that differ from each study. Thus, we undertook a systematic review to explore and identify theory-based behavioral interventions associated with medication understanding and use self-efficacy outcomes in stroke or its comorbidities.

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Review Article

Medication Understanding and Taking Self-Efficacy Theory-Based Interventions: A Systematic Review

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ABSTRACT

Self-efficacy is a predetermined behavioral factor of medication adherence, especially among patients with the risk of stroke. Nevertheless, an in-depth understanding of detailed scope in medication understanding and taking self-efficacy is of lack. Hence, through a broad literature search on medication-related self-efficacy trials, we undertook an evaluation of sixteen eligible studies on behavioral-based interventions. Their primary outcomes assessment focused mainly on the change of self-efficacy related behavioural constructs or actions. The majority of studies were conducted in the United States of America followed by Europe and Asia. The follow up trial period spanned from three months to one year, with most of them opted for the 2-arms RCT method. As for the results, heterogeneity was present; however, more than 80% of the studies reported significant differences ($p<0.05$) in the medication-related self-efficacy outcomes, which portrayed a positive effect. Nevertheless, interventions with multimedia usage displayed a 'promising potential technique' to assist patient education efforts. Altogether, there is limited evidence available on the intervention trials related to medication understanding and use self-efficacy among patients with stroke or its comorbid risk factor. Thus, behavioral researchers are encouraged to escalate more translational trials, particularly in the developing nations whom its aging workforce is at an upsurge in the coming decades.

Key words: Medication understanding, Medication taking, Behavioral research, Systematic review, Self efficacy.

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INTRODUCTION

Adherence to medication is well-defined as an extent of a patient to continue his prescribed medication to a certain degree, accepted and agreed by both the prescriber and patient.[1,2] Hence, medication adherence is very much related to medication-taking behavior. The medication-taking behavior is defined as an observation of variable human behavior characteristics to adhere to treatment by prescribers and is influenced by factors such as healthcare provider or societal-policies.[3] Nonadherence is, therefore, best seen as dependable on the personal justification of treatment and disease whereby the patient actively decides to stop taking their medications at the beginning or during various stages of their treatment phase. However, in certain circumstances, all these thoughts and medication-taking actions are influenced by patients' mental, physical, socioeconomic and cognitive capability in continuing the medication regimen.[4,5]

Self-efficacy has also been identified as a critical predictor of medication adherence.[6,7] The patients' belief builds upon common-sense evaluations of prescribed medicines, which involves perceptions of need for treatment and interest of potential adverse events.[8] The health belief model (HBM) suggests that with perceived susceptibility, severity, benefits and barriers to action, the self-efficacy mediates the extensibility of a patient's engagement in health-promoting behavior[9,10] which also supports the medication beliefs concept as part of the self-regulation of illness.[11]

Whereas, Albert Bandura, described self-efficacy as one's belief in own ability to succeed in specific situations or a function that determines the motivation to accomplish an action.[12,13] Studies have shown that patients with high self-efficacy perform better in terms of skills development and self-care disease management compared to their counterparts.[13] Besides, researchers had observed people with higher self-efficacy make an effort to complete their tasks with regards to choices affecting better health and medication-taking behavior outcomes.[14] Taking medication as coordinated is the patient's obligation; nonetheless, if the patient has inadequate experience of not seeing the importance of taking medications appropriately; thus, non-adherence is not an astounding outcome. Therefore, the antecedent of medication adherence brings us to the act of; the medication understanding and use self-efficacy (MUSE).[15]

There is increasing evidence that patients who have experienced stroke but highly self-efficacious are better in coping with the challenges of daily activities compared to their counterparts.[16] Severe stroke causes loss of mobility, which causes patients to experience the isolation of work and societal activities, which in the long run may increase the risk of post-stroke depression and worsen the quality of life.[17,18] Hence, self-efficacy helps patients with stroke to gain confidence and independence to manage and make an important decision about their illness.[19] Nevertheless, there is a lack of understanding among researchers with regards to personalizing methods. Despite the mounting evidence that health belief theory-enhancing interventions have a positive influence on chronic illness,[19-21] to date, there remains a lack of review on the appropriateness and outcome of such interventions on MUSE especially among patients with the risk of stroke. There is a crucial need for such evidence to guide healthcare providers in the development of patient-centered tools for stroke. PROSPERO registration: CRD42017069606.

MATERIALS AND METHODS

We applied an online search strategy involving the use of various health-related databases such as Pubmed, Ovid Medline, Proquest and Embase. We defined the search strategy with three categories used in combinations: (1) 'medication' OR 'drug' AND (2) 'self-efficacy' AND (3) 'adherence' OR 'compliance.' These search strategies and terms as per specific inclusion and exclusion criteria were adopted per database style. Cited references in selected articles were also cross-checked to determine trials that were not present in the databases. The research articles were then checked for duplicates.

Inclusion criteria

Only adults, both genders, patients diagnosed with a stroke or underlying risk factor involved in randomized controlled trials, pragmatic or quasi-trials, which applied the pre-test and post-test method, were included in the review. English language references were selected from January 2007 to December 2017, a period as we felt that preferences and styles of interventions follow a trend and evolve periodically. Therefore, references selected during this period would reflect the current situation. The references include interventions embedded with any health-belief theory, or behavioral technique associated with self-efficacy, that assessed primary outcomes related to MUSE.

Exclusion criteria

Patient samples with a cognitive disability, depression, or anxiety were excluded as these patients' perceptions toward the focus of outcome measures are not in concordance with this review. Besides, such studies involving none other than the patient were considered insignificant for this review. We also excluded reviews, protocols, design and development study, small sample-sized pilot study, or short trials; lesser than three months as it did not reflect a sustainable effort for behavioral intervention.

Quality assessment

Three reviewers used the Cochrane Collaboration's tool to assess the methodological quality of articles, whereby the studies were rated as having 'high', 'low' or 'unclear' risk of bias for selection, performance, detection, attrition and reporting.[22]

Analysis

We evaluated the effect of the interventions on self-efficacy and medication adherence or stroke risk factor effective control via significant differences between two or more groups (positive differences between control and intervention at two or more points of times). Qualitative analysis of subgroup characteristics compared studies of specific behavioral intervention method variance e.g., presentation style. Meta-analysis was inappropriate due to the heterogeneous nature of samples, settings, outcomes measures and follow-up period gaps.

RESULTS

In total, 1858, distinctive articles were identified electronically. On screening, we scanned the titles and abstracts for relevance and duplicates; thus, 1351 articles were removed. From those search results, we refined 507 articles for in-depth evaluation against inclusion and exclusion criteria and of these, only 16 out of 53 articles emerged to be appropriate for analysis. Figure 1 outlines the selection and screening process of the articles. All studies met an adequate Consolidated Standards of Reporting Trials (CONSORT) score, which portrayed good trial design, analysis and interpretation.

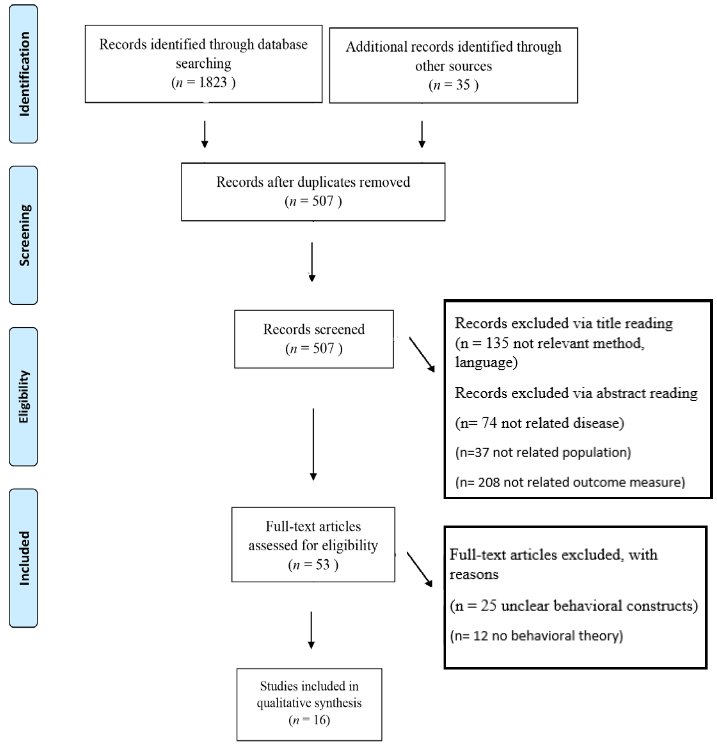

Figure 1: Selection and screening process of the articles.

General characteristics

Table 1 depicts the summarized information for the 16 selected studies. Seven of them were conducted in the North America region,[23-29] four in the Europe region,[30-33] three in the Asia region,[34-36] and one each in Oceania[37] and Africa region.[38] Six studies of patients' illnesses focused on diabetes,[23,24,26,30] six studies were on heart disease,[25,35,32,37,33] whereby one of them was a combination with hypertension,[27] three studies focused on stroke,[29,36,38] and one study targeted hypertension.[28] The majority of studies adapted the 2-arms RCT design compared to the 3-arms[32,28] and 4-arms design.[31] Nevertheless, the behavioral interventions used various methods that were unique in their ways, contributing to heterogeneity in terms of content, length of study and repetitiveness.

Interventions characteristics

The majority of studies applied several strategies to improve self-efficacy related to medication adherence,[24,25,31,26,28,37,29,33,38] but all interventions were best described as to improve self-care of the targeted illness with its self-efficacy in medication management. They were developed based on health behavior theoretical concepts related to self-efficacy in terms of medication taking. Thence, similar outcome measures of interest; MUSE. We distinguished the interventions into didactic or patient-centered techniques, nevertheless they differed in terms of presentation format and content personalization. Only five studies involved with the usage of multimedia formats, but vary in presentation type, length and constructs. They were video narratives design,[35,32] didactic phone-based text messages,[26,38] and interactive patient-centered text messages.[37] However, the face to face intervention delivery was the most commonly used, by which two of them were in the form of a didactic presentation by healthcare personnel.[28,29] But, the rest focused as a patient-centered effort,[23,24,30,31,27,36,33] with two studies being a combination of both didactic and patient-centered.[34,25] Nonetheless, the contents of each study spanned extensively at either honing patients' medication self-management,

Table 1: Summarized information of the 16 selected studies.

Author, year, country	Health issue	Study type and intervention design	Study duration (no. of follow-ups)	Health Belief construct/ behavioural technique	Sample		Primary outcome/assessment; significant differences (p<0.05), Odds ratio, OR, confidence interval, CI)
					Control	Intervention	
William P.S. *et al.* (2009) USA[23]	Type 2 diabetes	2-arm RCT, Usual care vs Telephone (coach) intervention	6 months, 2 follow up	Paraprofessional coaching (self-efficacy, social reinforcement)	27	21	a)The Diabetes Knowledge Test; $p>0.05^{c}$ b) Summary of Diabetes Self-Care Activities; $p<0.05^{a,c}$ c) The Multidimensional Diabetes Questionnaire Self-Efficacy subscale; $p<0.05^{a,c}$ d) Awareness of self-care goals; $p<0.05^{a,c}$
Tan M.Y. *et al.* (2010) Malaysia[34]	Diabetes	2-arm RCT, Usual care vs Structured education programme (face to face and telephone calls)	3 months, Pre-post	Self-efficacy and self-care	82	82	a)Revised Diabetes Self-care Activities (RDSA) Questionnaires i)Medication adherence; $p<0.05^{a,b,c}$ ii)Dietary intake; $p<0.05^{a,b}$ iii)Total physical activity; $p<0.05^{a,c}$ iv)Glucose self-monitoring; $p<0.05^{a,c}$; mean differences 0.56, 95% CI: 0.32–0.80 b) HbA1c; $p<0.05^{a,c}$; mean differences 1.75, 95% CI: 8.45–9.02
Wolever R.Q. *et al.* (2010) USA[24]	Type 2 diabetes	2-arm RCT, Usual care vs Integrative health coaching	6 months, Pre- post	Integrative health coaching (Self-awareness)	26	30	a) Patient activation measure (PAM-13); $p<0.05^{a,b,c}$ b) Morisky adherence scale; $p<0.05^{a,b}$ c) The benefit-finding scale; $p>0.05^{b}$, $p<0.05^{a,c}$ d) A1C; $p>0.05^{b,c}$
Barnason S. *et al.* (2010) USA[25]	Heart failure	2-arm RCT, Usual care vs Transition intervention	3 months, pre-post	Transition intervention mechanism (social cognitive Theory)	20	20	a) Medication adherence; $p<0.05^{a,c}$ b) Medication use barriers management (BMQ)l; $p<0.05^{a,c}$ c) Medication use skills (DRUGS); $p>0.05^{b,c}$ d) Self-efficacy for HF self-care; $p<0.05^{b,c}$
David T. *et al.* (2012) France[30]	Type 2 diabetes	2-arm RCT, Usual care vs 3-day Therapeutic patient education programme	3 months, pre-post	Self-efficacy and perceived competence	60	60	a) Summary of Diabetes Self-Care Activities Questionnaire; $p<0.05^{a,c}$ b) HbA1c i)Physical activity; $p<0.05^{a,c}$ ii)Dietary behaviours; $p<0.05^{a,c}$ iii)Medication adherence; $p=0.61$ c) The Perceived Competence for Diabetes Scale i)Physical activity; $p<0.05^{a,c}$ ii)Dietary behaviours; $p<0.05^{a,c}$ iii)Medication adherence; $p=0.07$

Continued...

Table 1: Cont'd.

Author, year, country	Health issue	Study type and intervention design	Study duration (no. of follow-ups)	Health Belief construct/ behavioural technique	Sample		Primary outcome/assessment; significant differences (p<0.05), Odds ratio, OR, confidence interval, CI)
					Control	Intervention	
Sanjay A. *et al.* (2014) USA[26]	Type 2 diabetes	2-arm RCT, Usual care vs Text-message intervention	6 months	Motivation, self-efficacy and self-care behaviours concept	64	64	All patients[c] a) Diabetes Empowerment Scale Short Form; Δ0.1 (95%CI -0.2 - 0.4) b) Hb A1C; $p= 0.230$ c) Morisky Medication Adherence Scale–8; Δ1.1 (95%CI 0.1- 2.1) d) Summary of Diabetes Self Care Activities Scale (monitoring); Δ0.6 (95%CI -0.4 - 1.5) Spanish speaking patients[c] a) Diabetes Empowerment Scale Short Form; Δ0.2 (95%CI -0.2 - 0.6) b) Hb A1C; $p= 0.025$ c) Morisky Medication Adherence Scale–8; Δ1.4 (95%CI 0.2 - 2.7) d) Summary of Diabetes Self Care Activities Scale (monitoring); Δ0.9 (95%CI -0.2 - 1.9)
Seon Y.H and Jin S.K. (2014) Korea[35]	Acute coronary syndrome	2-arm pre-post quasi experiment, Usual care vs Risk factor-tailored small group education (multimedia)	12 months, 3 follow-up	Motivational support programme (self-efficacy-in self-care awareness)	40	34	a) Self efficacy scale; $p<0.05$ [a,b,c] b) Self-care compliance; $p<0.05$[a,c]
Mary E.C *et al.* (2014) USA[27]	Coronary artery disease and Hypertension	2- arm RCT, Patient education vs Patient education with the support with positive effect and self-affirmation	12months, Pre-post (2 months once follow up for the intervention group)	Positive effect and self-affirmation (self-efficacy)	Angioplasty (n=115) Hypertension (n=125)	Angioplasty (n=122) Hypertension (n= 131)	a) Self efficacy for behaviour change; $p<0.05$[a,c] b) Positive and negative psychosocial changes; $p<0.05$[a,c]
N.E. Stanczyk. *et al.* (2015) Netherlands[32]	Cardiovascular	3-arm RCT, Usual care vs Computer tailored video or text based intervention with 6 feedback session	12 mths, pre-post	I-Change model (Motivation to change and self-efficacy)	721 (generic advice,G)	670 (video,V) 708 (text,T)	a) Readiness to quit smoking Video; $p<0.05$ [a, c] G (OR =1.90,p= .005) and T(OR = 1.71,p= .01) b) Self-efficacy; $p= 0.22$
Leila P.D. *et al.* (2015) New Zealand[37]	Coronary heart disease	2-arm RCT, Usual care vs personalized 24-week mHealth program	6 months, 2 follow up at 3 and 6 months	mHealth program, (social cognitive theory)	62	61	a) Self-efficacy for Managing Chronic Disease 6-item scale; $p>0.05$[c] b) Brief Illness Perception Questionnaire; $p>0.05$[c] c) Morisky 8-item Medication Adherence Questionnaire (mean differences: 0.58, 95% CI 0.19-0.97; P=.004[a,c])

Continued...

Table 1: Cont'd.

Author, year, country	Health issue	Study type and intervention design	Study duration (no. of follow-ups)	Health Belief construct/ behavioural technique	Sample		Primary outcome/assessment; significant differences ($p<0.05$), Odds ratio, OR, confidence interval, CI)
					Control	Intervention	
Janet W.H.S *et al.* (2016) Hong Kong[36]	Stroke	2-arm RCT, Usual care vs Patient empowerment intervention	6 months, Follow up at T1:1 week, T2:3 months and T3:6 months	Self-efficacy and self-management behavior	105	105	Chinese Self-Management Behavior Questionnaire a) Self efficacy in illness management T1 (OR= 2.11 (95 % CI =(−1.77- 6.00); ($p>0.05$)[c] T2 (OR= 5.44 (95 % CI =1.24- 9.64); ($p<0.05$)[a,c] T3 (OR= 5.59 (95 % CI =1.22- 9.95); ($p<0.05$)[a,c] b) Self BP -monitoring T1(OR= 2.49 (95 % CI =(1.32-4.68); ($p<0.05$)[a,c] T2 (OR= 2.56 (95 % CI =(1.32-4.96); ($p<0.05$)[a,c] T3 (OR= 2.31 (95 % CI =(1.11-4.81); ($p<0.05$)[a,c]
Karin M. *et al.* (2016) Germany[33]	Chronic heart failure	2-arm RCT, Usual care vs Patient-centred self-management educational program	12months, 2 follow up at 6 and 12 months	Integrated self-management behaviour and self-efficacy	227	248	At 6 months a) Self-efficacy sub-scale of the Kansas City Cardiomyopathy Questionnaire; $p>0.05$[c] b) Symptom control-monitoring; $p<0.05$[a,c] c) Medication Adherence Report Scale; $p>0.05$[c] d) Quality of life; $p>0.05$[c] At 12 months a)Self-efficacy sub-scale of the Kansas City Cardiomyopathy Questionnaire; $p>0.05$[c] b)Symptom control-monitoring; $p<0.05$[a,c] c) Medication Adherence Report Scale; $p>0.05$[c] d)Quality of life; $p>0.05$[c]
Fred S. *et al.* (2017) Ghana[38]	Stroke	2-arm cluster-RCT, No medication text sms and BP self-measure vs With medication text and BP self-measure	3 months, Pre- post	Motivation (Social cognitive theory)	27	29	a)15-item treatment self-regulation questionnaire; $p<0.05$[b] b)Systolic blood pressure; $p>0.05$[c] c)Medication possession ratio (MPR); $p>0.05$[c] d)18-item perceived confidence scale Intervention group; $p<0.05$[a,b]

[a]Differences favour intervention group, [b]within group, [c]between group

perception, lifestyle and diet balance or awareness. Therefore, the heterogeneity of the studies caused many limitations to determine which method best addressed behavioral constructs related to MUSE.

Effect of self-efficacy outcome based intervention

Thirteen of the 16 studies (81%) reported a significant ($p< 0.05$) effect of their intervention on MUSE, which is inclusive of positive differences in medication usage or adherence[23-24,30-27,37,36,38] except for study[25] that reported a lower impact on medication use. Nevertheless, we became aware that two studies (13%) had a significant effect on illness management self-efficacy, which encompasses self-monitoring and illness prevention control.[28,33] However, one study reported improvement with only the Spanish speaking group.[26] Furthermore, one study reported coping and preparatory planning improvement in the readiness to quit smoking.[32] Nevertheless, few studies had non-significant effect on illness management self-efficacy.[24,30,31,37,36,38] Besides, a subgroup analysis of five studies, which also explored belief or psychosocial outcome,[24,30,31,27,38] reported significant enhancement of variables related to self-efficacy behavioral constructs (e.g., confidence, perceived benefit) except for study[37] which stated non-significance on those constructs (p>0.05). Nonetheless, considering all variables more subjectively, none of these studies exceeded a better intervention impact for risk factor prevention compared with others because of outcome-weighted differences (e.g., subjects, sample size, follow-up frequency).

DISCUSSION

This review indicates a lack of evidence on the aptness of interventions on medication taking behavior, especially MUSE among patients with the risk of recurrent stroke. There was variation in the behavioral theories adaptation and how the constructs were integrated into the intervention to observe targeted outcomes related to MUSE (e.g. medication and lifestyle adherence, smoking cessation, blood pressure control, diabetes monitoring). We observed a clear demonstration of specific techniques (preference of the patient-centered method) towards medication-taking self-efficacy enhancement and understood that the communication technique plays the most crucial criterion for the said self-efficacy. Nevertheless, the majority results were in the projected course; towards behavioral improvement despite various outcome differences between the experimental and control subjects.

Behavioral theory and outcome measure

The self-efficacy construct was applied as an integrated basis in the conceptual framework of all studies. This embedded construct within the social cognitive theory,[12,13] is also the mainstay of self-concepts in sync with the self-affirmation notion.[39] Similarly, self-efficacy enhances motivation parallel to the self-determination theory.[40] Furthermore, the Stages of change model[41] and the Health Belief Model[9,10] have integrated the self-efficacy construct as a crucial element in their behavioral modification framework. Thence, a purposeful outcome measure, self-efficacy, was conceptualized and incorporated in the interventions.

Nonetheless, behavior changes outcome measurement is versatile and remains a challenge for researchers. Hence, it was apparent that several studies reported continuous variables such as HbA_{1c} or blood pressure[34,24,30,26,28,38] to brace the relevance of the self-efficacy outcome. In contrast, the rest of the other studies opted for other related behavioral competencies (e.g., self-care, medication adherence, illness perception and self-monitoring). These actions suggest that the improvement of medication-taking or medication use self-efficacy among patients with diverse medical or medication history is not well-founded. Therefore, the medication associated self-efficacy outcome-based interventions for stroke was with limitation and thus could not be generalized with other population.

Health related communication

In the interim of analysis of the 16 studies, providing information about the illness and medication management as well as ensuring patient engagement in self-care health activity were considered important. Patient-centered communication and care concepts[42,43] were widely optimized compared to the didactic approaches as the former method ensures patient participation in deciding the best quality of life improvement. However, several studies in this review[25,32,33] contradicted the efficacy of the patient-centered method, which reflected non-significant differences of specific self-efficacy tasks (e.g., adherence, illness management) between groups but instead favored the didactic approach.[26,29,38] Hence, in those studies, there were possibilities that the communication barriers between patient and provider were unidentified, or personalized communication needs were insufficiently catered. Thus, this brings about the views on the preferences of information presentation format. It is undoubtedly that face to face approach was a popular choice as well as the majority of the studies inclined towards positive intervention efficacy. However, the method is still debatable, whereby bias of self-reporting, the intensity of follow-up and funding constrain remained high.[44,45]

With this said, we were aware that the multimedia-assisted method is considered as a choice of intervention since few studies achieved significant differences in the formerly reported outcomes.[35,37,38] These studies demonstrated the persuasive power of motivational texts or narratives to sustain individuals' health activity, belief or perception.[46,47,48] The truth was that each risk factor which comorbid stroke, was different in terms of its mental and physical severity challenge stages. Consequently, we recommend that care is taken into developing specific cues of action to enhance a focused self-efficacy ability as patients' need.[49] It is crucial and would be useful to understand the applicability of each intervention in an actual healthcare setting, giving the importance to the availability of supporting workforce and cost.

CONCLUSION

As health is defined 'complete well-being rather than the disease absence,'[50] therefore, shared decision-making comes with the task of healthcare providers' preparedness in understanding the belief and attitude of their patients. The complexity of the emotion, motivation and perception component of behavioral changes makes an individual unique to one another. Thus, personalizing health communication to impact self-efficacy, especially among patients with a stroke risk factor, requires a comprehensive approach with specific-skill outcome measures and sensible application of behavioral interventions.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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1.7.2 Summary of systematic review

It is a necessity to incorporate health belief model constructs in interventions that intend to enhance medication-taking self-efficacy among patients with stroke or its comorbidities. There is also a need to customize self-efficacy measures to reflect appropriate health behavioral action. The audiovisual is a potential technique to help in patient engagement and has gained insights to promote significant improvement in the behavioral outcomes. Whereas, motivational texts or narratives has a persuasive strength to cause the change in belief. Thus, there was a quest for more evidence on behavioral-theory-based intervention on MUSE in the Asiatic region if Malaysia was to adapt these strategies for its stroke patient education initiatives.

1.8 The research gap

Malaysia encompasses various ethnicities. It remains a challenge for healthcare educationists to seek for culturally appropriate methods to increase awareness among post-stroke patients to be proactive and self-efficacious. The stroke burden is on the rise; hence, there was a need for specific, sensitive, and applicable patient education measures. Apart from the tremendous efforts taken by the Government and the private health sector to control recurrent stroke risk factors, there are many areas for improvement in patient education related to stroke. Also, there is a lack of references for the effectiveness of audio-visual tools in stroke education. Moreover, there is also limited knowledge on the impact of narratives on the post-stroke patients' self-efficacy in understanding and using prescribed medication. Therefore, we embarked on this trial to seek for a potential strategy to reduce the burden of stroke in Malaysia.

1.8.1 Aims and objectives

We aimed to use video narratives as a tool to assist post-stroke patients to be self-efficacious in understanding and taking their prescribed medication appropriately. With this self-efficacy changes, post-stroke patients would also be proactive to enhance their stroke risk factor control to prevent a recurrence especially during their first year of stroke event.

Therefore, the main objective of this study was to evaluate the impact of video narratives on MUSE.

More specifically, the secondary objectives link to the step-by-step processes towards its evaluation

- to explore the specific factors associated with MUSE constructs,
- to design and develop the video narratives as per local population needs
- to explore the feasibility and acceptability of the developed video narratives and procedures as per RCT protocol.
- to evaluate the effectiveness of the video narratives in enhancing MUSE.

1.8.2 Research question

The thesis research question was:

Can video narratives be utilised to motivate patients to be self-efficacious in understanding and taking prescribed stroke preventative medication?

Thus, we began our quest with the development of behavioral theories and concepts.

1.9 Theoretical and conceptual frameworks

An individual with high motivation and determination takes the necessary effort to acquire specific knowledge and required self-efficacy, to engage in health-promoting behavior [26, 48, 49]. Thus, motivation and personality are associated with satisfaction of action and outcome among patients. Self-motivation can be divided into; an intrinsic or extrinsic motivation [50, 51]. Intrinsic motivation showcases the inner personal emotion of a person attempting a health activity, whereas extrinsic motivation displays a health behavior modification to avoid unwanted perceived effects of the disease [50, 52]. In summary, a high self-motivated patient sees adherence to a specific medication regimen as a simple routine, whereas the opposite sees it as a hurdle or hardship that can affect his or her quality of life. In other words, a highly motivated person has self-confidence, strong belief, and a positive attitude (a mental disposition) to be resilient.

Nevertheless, an individual who is not aware of his or her prescribed medication would undeniably doubt its efficacy. Furthermore, the action to ‘take’ or to ‘ignore’ prescribed medicine relies on self-learned experience or practice, is determined by attitude and self-motivation. The Health Belief Model (HBM) explains this phenomenon. This model suggests that individuals improve their health based on their perceived susceptibility and severity of illness. The illness affects their quality of life; therefore, they develop several actions to avoid perceived illness consequences. HBM also suggests that individuals also consider the costs and challenges despite seeking the benefits of taking the planned action [53,54]. Therefore health belief and self-motivation are inseparable and were requisite in the conceptual framework.

We also sought for a cognitive strategy that would enable HBM information delivered effectively to a targeted population. Therefore, the Information-Motivation-Behavior (IMB) system was adopted. It is a health behavior change framework in line with patient education intervention [55, 56]. Studies that applied the IMB model had reported significant behavioral outcomes with interventions using several strategies such as information technology, audio-visual, and personalized counseling [57-59]. The ‘Information’ interlinks knowledge about the illness and behavioral suggestions to overcome barriers towards adherence. Whereas, ‘Motivation’ is the personal attitude (level of self-confidence) and perception towards the activation of the individual response. As well as, ‘Behavior’ is the behavior skills or specific learning skills (as cues to actions related to the knowledge and motivation) that enable favorable behavior modification. The self-efficacy (as the output), then ensures the patients seek adequate resources for the final execution of an action concerning their health outcomes [56, 60]. We deduce that, within the context of IMB and applying the Health Belief Model (HBM) constructs, this conceptual framework could deliver a package that promotes self-efficacy of understanding the purpose of prescribed medicines and appropriate medication management for post-stroke patients [53, 61].

According to the “Cognitive Dissonance Theory,” the beliefs, perceptions, or attitudes can be changed within the self to adapt a preferred choice or attitude against the deeply seated practice or behavior [62]. However, to facilitate the shift and reduce disharmony of conflicting beliefs or perceptions, one must have the will and motivation to take the first step and sustain. The systematic review findings helped to decide that audio-visual technology was the best option to screen the trigger factor of the conceptualized package. In short, the collective concepts of IMB and HBM as the framework, the video narratives assisted as the delivery mechanism.

Narratives support knowledge gain, enhances confidence, and promote self-learning among peers with similar illnesses [63, 64]. Personal motivational stories from patient peers and healthcare professionals set in as role models for motivating patients for behavior-health changes [65]. The narratives support people to ‘overcome resistance and facilitate information processing’ [66]. Thus, our trial basis combined audio-visuals of a doctor’s narrative that was a source of a ‘scientific informant,’ to supplement a patient’s stroke experiences as a ‘peer informant.’ The union of both narratives acted as a psychological buffer and simultaneously increased the motivational strength. This acted as a trigger for patients towards MUSE and subsequent health behavior changes.

The theoretical and conceptual model communicates the HBM constructs in the IMB framework to affect MUSE, as illustrated in (Figure 1). The funnel represents the tool (the video narratives), which conveys the HBM construct based (Information on illness perception and treatment management skills) and a trigger factor (Motivation and emotion from the storytellers). The funnel then emanates the intended (Behavioral action) to execute MUSE. This framework is best to be implemented concurrently with patient education modules during MTAC or patient bed-side counseling session, or after the medication dispensing process at the inpatient post discharge period.

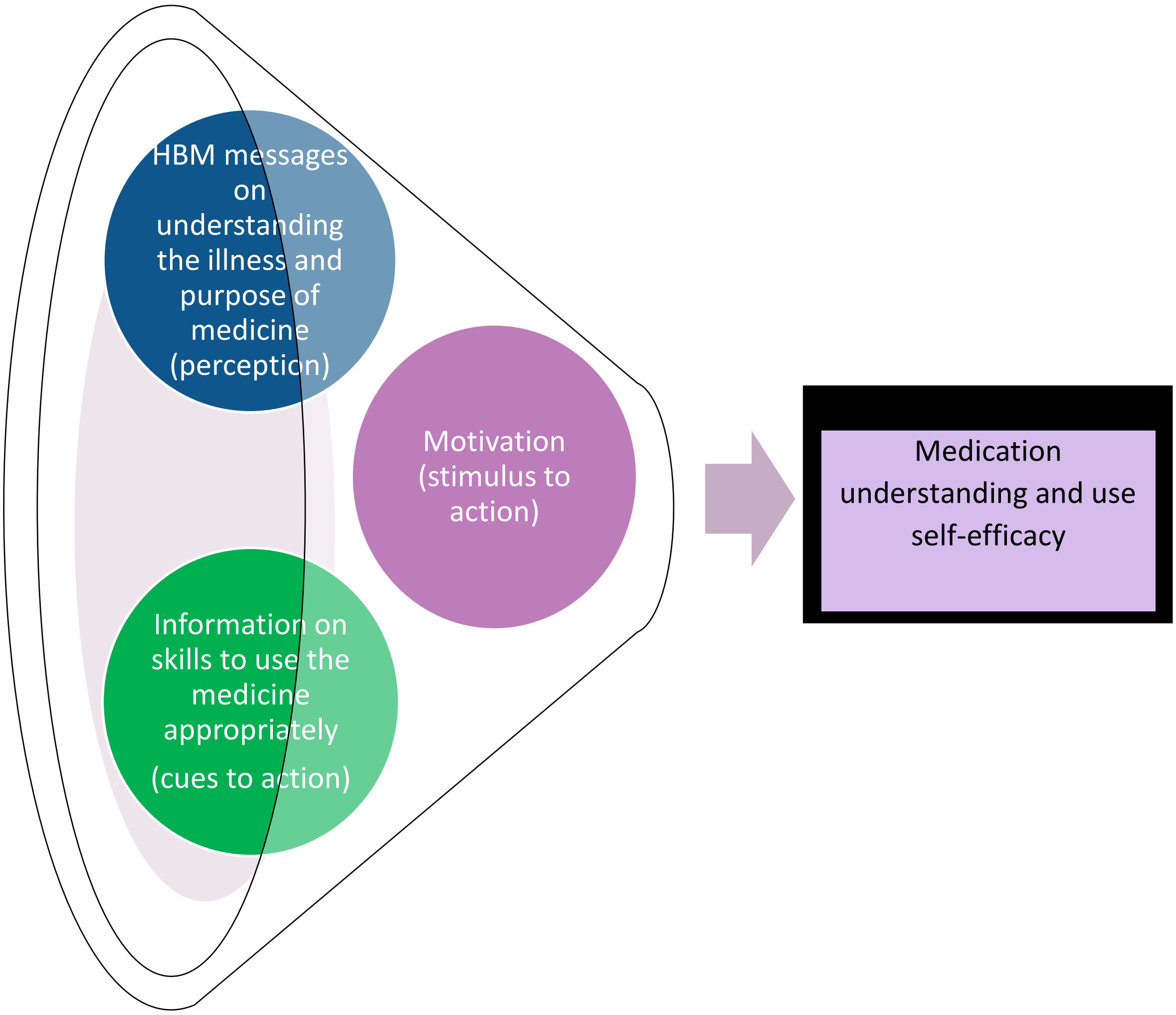

Figure 1: The representation of the theoretical and conceptual model.

The circular shape of equal sizes, but in various colors in the represent different behavioral strategies; i) HBM construct messages, ii) Illness perception and treatment management skills and iii)Motivational trigger factor. The funnel then emanates the integrated behavioral actions towards MUSE.

CHAPTER 2:Determining the modifiable factors associated to MUSE

2.1 Preamble

Perception, knowledge, and self-motivation are associated with self-efficacy. Thus, this theoretical, conceptual framework incorporated the associated criteria to focus on self-efficacy enhancement of medication understanding and use among post-stroke patients. Nevertheless, in the preparation of optimizing the impact of video narratives, its contents needed to be personalized for the targeted population. Every individual differs from one another in terms of illness severity, social involvement, and health practice. However, it was essential to seek for modifiable behavioral similarities among the post-stroke patient population. This quest was a crucial need to develop a suitable intervention package as per the conceptualized plan. Therefore, to address this gap, a cross-sectional survey was implemented to determine modifiable factors associated with self-efficacy using the MUSE outcome measure among post-stroke patients. This outcome measure has two main constructs representing MUSE, which are; 1) learning about medicine (LM) and 2) taking medicine (TM). MUSE is also associated with medication adherence. Thus, it was also necessary to seek for factors parallelly associated with medication adherence and MUSE to observe a refined and meaningful research scope. The following paper describes the study.

Patient Preference and Adherence

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ORIGINAL RESEARCH

Exploring stroke survivors' self-efficacy in understanding and taking medication and determining associated factors: a cross-sectional study in a neurology clinic in Malaysia

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Background and aim: Evidence-based prescribing practices for stroke-preventive medication have benefited stroke survivors; however, medication-nonadherence rates remain high. Medication understanding and use self-efficacy (MUSE) has shown great importance in medication-taking behavior, but its relationship with medication nonadherence in stroke-preventive regimens lacks exploration. The aim of this study was to determine the prevalence of MUSE and its association with nonadherence causes and other potential factors among stroke survivors in Malaysia.

Methods: This cross-sectional study was conducted among 282 stroke patients who provided informed consent and were in follow-up at the Neurology Outpatient Department of Hospital Kuala Lumpur, Malaysia. The study employed a data-collection form that gathered information on sociodemographics, clinical treatment, outcome measures on MUSE, and medication-nonadherence reasons.

Results: The prevalence of poor medication understanding and use self-efficacy among stroke patients was 46.5%, of which 29.1% had poor "learning about medication" self-efficacy, while 36.2% lacked self-efficacy in taking medication. Beliefs about medicine (74.02%) was the commonest reason for medication nonadherence, followed by medication-management issues (44.8%). In the multivariate model, independent variables significantly associated with MUSE were health literacy (AOR 0.2, 95% CI 0.069–0.581; P=0.003), medication-management issues (AOR 0.073, 95% CI 0.020-0.266; P<0.001), multiple-medication issues (AOR 0.28, 95% CI 0.085–0.925; P=0.037), beliefs about medicine (AOR 0.131, 95% CI 0.032–0.542; P=0.005), and forgetfulness/convenience issues (AOR 0.173, 95% CI 0.050–0.600; P=0.006).

Conclusion: The relatively poor learning about medication and medication-taking self-efficacy in this study was highly associated with health literacy and modifiable behavioral issues related to nonadherence, such as medication management, beliefs about medicine, and forgetfulness/convenience. Further research ought to explore these underlying reasons using vigorous techniques to enhance medication understanding and use self-efficacy among stroke survivors to determine cause–effect relationships.

Keywords: medication understanding, medication taking, self-efficacy, poststroke, cross-sectional

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Plain-language summary

Medication-taking behavior is an important criterion in optimizing the effect of preventive treatment in chronic illness, such as stroke. This study depicts patterns and factors determining the importance of self-efficacy that influence medication-taking behavior among stroke patients in Malaysia. The study was carried out on 282 informed and consented stroke patients from September 2017 to November 2017 via two valid and reliable survey measures: medication understanding and use self-efficacy (MUSE scale) and medication-nonadherence reasons (eleven-item Medication Adherence Reasons scale). The MUSE scale identified that 29.1% of the patients had poor "learning about medication" self-efficacy, while 36.2% lacked self-efficacy in taking medication. These characteristics are highly related to health-literacy and medication-adherence factors, such as medication management, beliefs about medicine, and forgetfulness/convenience. This findings helped to identify a focus area in the development of future patient-education interventions.

Background

Stroke has been identified to cause significant disability among its survivors, and its global prevalence has been projected to double by 2035.[1,2] Approximately 23% of acute stroke cases recorded yearly in Malaysia are patients with recurrent stroke.[3] Ischemic incidence has been reported to increase annually by 29.5% and almost 18.7% for hemorrhagic stroke.[4] Stroke-prevention medication, such as antiplatelets and anticoagulants, have improved the morbidity and mortality of stroke patients.[5–7] Nevertheless, it is crucial to sustaining medication adherence to achieve optimal treatment effects.[8] However, medication-nonadherence prevalence is high among major chronic diseases, including stroke, despite patient-education innovations.[9,10]

The World Health Organization defines "adherence" as "the extent to which a person's behavior — taking medication (TM), following a diet, and/or executing lifestyle changes — corresponds with agreed recommendations from a health-care provider".[11] Many Asian countries report 40%–80% medication-nonadherence rates in chronic illness.[12,13] There are possibilities that medication nonadherence results in stroke-prevention deficits, leading to stroke recurrences.[14] Also, poor adherence to medication predisposes these patients to complications, more hospital admissions, and higher health-care expenditure.[15]

Self-efficacy is defined as faith and confidence in oneself to be able to perform a specific action to achieve a goal.[16] Social cognitive theory and the health-belief model propose that medication adherence is often influenced by "belief modifying factors" that relate to how one perceives their health problem, which determines individual self-efficacy toward likelihood to adhere to prescribed medications.[17,18] Research has shown that nonadherence to stroke-preventive medications is associated with lack of medication understanding and use self-efficacy (MUSE) among stroke survivors, despite health education efforts.[19] The need for a patient's behavioral change is influenced by psychosocial factors, such as attitudes, other than demographic factors or health attributes, and it is difficult to confirm a consistent association between them due to related confounding causes, such as beliefs and perceptions, which are not easily influenced by education.[20] Recurrent stroke-preventive medication is a long-term and asymptomatic therapy that requires constant medication adherence for optimal health outcomes. It is vital to recognize and identify self-efficacy cues that influence medication adherence, and hence efforts toward understanding patient self-efficacy in medication management, especially in medication-taking behavior, are warranted.

It is vital to recognize and identify specific medication-nonadherence cues as per local environments that influence MUSE, so as to guide in developing personalized behavioral interventions to enhance medication-taking behavior. To our knowledge, there has been limited evaluation of medication-taking self-efficacy tasks, such as understanding and using medication appropriately, among stroke patients. As such, to address this gap, the objective of this study was to explore self-efficacy prevalence and determine potential medication-nonadherence factors associated with self-efficacy in learning about medicine (LM) and TM in stroke patients. Limited resources are at hand regarding tailored intervention to enhance self-efficacy in medication management. Therefore, the study's findings are necessary to elicit cues that influence self-efficacy in terms of medication-taking actions. These cues would help to ascertain appropriate outcome measures for personalized interventions and be of advantage in the development of patient-education tools for recurrent stroke.

Methods

Study settings and population

This cross-sectional single-center study was conducted from September 2017 to November 2017 among stroke in patients who were on follow-up at the Neurology Outpatient Department of Hospital Kuala Lumpur (HKL), Malaysia. HKL is the oldest and foremost tertiary hospital in Malaysia, and receives a high number of stroke patients and referred stroke patients from throughout Malaysia: about 1,000 in patients with neurological disorders, including acute and recurrent stroke, annually.[21]

Patient invitation was done via convenience sampling from a list of the neurology clinic's medical record. Inclusion criteria were adults (age >18 years), diagnosed with first stroke within six months from the initial screening, and on stroke-preventive medication, such as antiplatelets or anticoagulants. Those who had been diagnosed with depression and impaired memory were excluded. Only those able to converse, read, and write in Malay or English were selected. Patients who agreed to participate were informed about the study objectives, and their consent were obtained. They were given a choice of responding to the questionnaires during their visit to the clinic or at home. Responses were retrieved on the same day or by post.

Sample size

There is a lack of research on stroke patients. Therefore, references on appropriate sample size for significant end results were not available. However, a meta-analysis on beliefs and medication adherence of 94 studies quoted an average sample of 266.[22] Based on a sample-size calculation for a study of finite population[23] and with consideration of the annual number of inpatients at HKL, a sample of 278 patients was considered adequate to elucidate significance in this study with a margin of error of ±5%. An attrition rate of 15% was considered to compensate for missing data and nonresponse, for a final sample of 320.[24,25]

Ethics statement

Ethical approvals were obtained from the Malaysian Medical Research and Ethics Committee, Ministry of Health Malaysia (National Medical Research Register ID 15–851-24,737) and the Monash University Human Research Ethics Committee (ID 9640). This study contributes to preliminary findings of the MyStrokeStory trial, which was registered with the Australian New Zealand Clinical Trials Registry (Australian clinical trials registration number 12618000174280) under Universal Trial Number U1111-1201–3955.

Study instruments

Patient information was derived from an interviewer-assisted data-collection form consisting of two sections: sociodemographic information (sex, age, ethnicity, education attainment, and health literacy) and clinical health information documented in medical records. Health literacy was assessed using the Newest Vital Sign.[26] Medical records included such information as type of stroke, stroke severity, stroke-risk factors (eg, diabetes, hypertension, or hyperlipidemia) and baseline blood parameters that defined disease comorbidities. Hypertension was defined by blood pressure >140/90 mmHg for those with no diabetes and >130/80 mmHg for those with diabetes. Patients were diagnosed as diabetic if their A_{1c} was >6%, venous fasting plasma >7 mmol/L, and random plasma >10 mmol/L.[27] Those with hyperlipidemia were defined by low-density-lipoprotein cholesterol >3.4–4.2 mmol/L and triglycerides >8.3 mmol/L. International normalized ratio control for patients with atrial fibrillation was 2–3.[28–30]

The primary outcome for this study was MUSE using a validated self-rated scale developed by Cameron et al.[31] MUSE is a brief eight-item questionnaire able to measure patient self-efficacy in LM and taking them appropriately. Patients were asked to give ratings of 8–32 on the four-item scale: if they agreed or disagreed, and the extent to which they agreed or disagreed slightly or strongly. Scale scores ≥3 for each item were associated with higher self-efficacy. The TM domain constituted four items: "It is easy for me to take my medicine on time", "It is easy to remember to take all my medicines", "It is easy for me to set a schedule to take my medicines each day", and "It is easy for me to take my medicines every day". The LM domain consisted of the items "It is easy for me to ask my pharmacist questions about my medicine", "It is easy for me to understand instructions on medicine bottles", "It is easy for me to get all the information I need about my medicine", and "It is easy for me to understand my pharmacist's instructions for my medicine". This scale has been found suitable to be used for primary-care outpatients regardless of age, sex, education, or number of medications, and has been adapted for patients with diabetes.[32] However, due to the small study sample, the authors translated MUSE according to standard guidelines[33] and pretested it among 150 stroke patients prior to this study. Good comprehension and relevance to construct (item content–validity index [i-cvi] values >0.83 were obtained from ten bilingual patients during the face- and content-validity phase. Principal-component analysis with item-factor loading >0.5, and internal consistency Cronbach's α approximately 0.7, for both the LM and TM domains confirmed no modifications were required for the translated version. Test–retest reliability (within 2 weeks apart) in a sample of 36 patients resulted in an intraclass correlation coefficient >0.7 being derived for both domains. Therefore, the English and Malay MUSE versions were considered valid and reliable to be used for stroke patients in Malaysia.

The authors believed that a good medication-adherence measure would be able to elucidate perceived reasons contributing to medication nonadherence. The self-administered eleven-item Medication Adherence Reasons Scale (MAR-Scale) in Malay and English was used to list reasons for medication nonadherence apart from assessing its level in this study. The 15-items MAR-Scale was originally developed in English by Unni.[34] It was then translated to Malay and modified to the eleven-items MAR-Scale by Shima et al,[35] which was pretested among 665 patients diagnosed with chronic diseases from government healthcare settings. Initially, 15 items were retained via exploratory factor analysis, of which five extracted factors inclusive of "availability issues" achieved eigenvalues >1. However, on confirmatory factor analysis), only eleven items demonstrated good convergent validity and adequate discriminant validity. The scale also demonstrated adequate factorial invariance across sex and ethnicity. The eleven items were consolidated into four domains: managing issues, four items; multiple-medication issues, two items; beliefs about medication issues, three items; and forgetfulness and convenience issues, two items. Since patients in this study had also been diagnosed with chronic diseases as per inclusion criteria, the eleven-item Malaysian MAR-Scale was considered valid and reliable to be used among stroke patients. Patients who had missed taking their medications were requested to quantify the number of days that they had been nonadherent and to indicate the reasons for missing their medications using a five-point Likert scale, with patients who scored ≤11 for no medication-adherence issues classed as adherent and >11 as nonadherent.

Data-collection procedures

Patients were approached with information sheets and informed-consent forms at the Neurology Outpatient Clinic while they were waiting for their appointments. Those who had consented to participate in the study were asked to fill both self-administered questionnaires, which took <10 minutes to complete. Patients who opted to complete the questionnaires at home were asked to send their replies via a self-addressed envelope provided to them.

Statistical analysis

Descriptive statistics were used for all variables and outcomes in this study, with χ^2 tests via cross-tabulation analysis used to explore significant associations between sociodemographic variables, eg, age, sex, and health literacy, and stroke-treatment characteristics, eg, blood-pressure control, prescribed number of medications, and exposure to previous stroke education with MUSE (poor vs good). Similar analysis was also performed to explore associations between medication-nonadherence categories with MUSE, and the strength of all these relationships was determined by Cramér's V and φ. Mann–Whitney U tests and Kruskal–Wallis test were performed to determine significant differences ($P<0.001$) between dependent variables: MUSE and medication adherence with two or more groups of independent variables (potential associated medication-nonadherence factors). Multinomial logistic regression was performed to assess associations between MUSE LM and TM (three categories) and MAR-Scale constructs and related sociodemographic and treatment characteristics. Results were considered significant if $P<0.05$ using two-sided t-tests or Wald tests. Statistical analyses were performed using SPSS 24.0.

Results

Sample characteristics

A total of 320 patients with stroke were informed and invited to participate in the study, and 282 (88.1% response rate) consented to participate: 189 (67%) males and 93 (33%) females. The mean age of the patients was 57±12 (27–92) years. The bulk of them 155 (55%) were Malay, followed by 74 (26.2%) Indian and 46 (16.3%) Chinese. Almost half the sample had completed secondary education (55.3.1%), 19.5% had completed tertiary education, and those with good health literacy accounted for 182 (64.5%) of the study population. With regard to disease comorbidities, 66.7% had been diagnosed with ischemic stroke, followed by TIA (30.9%), with hypertension being the main stroke-risk factor (97.2%). A majority of patients perceived themselves to have been exposed to stroke education or were familiar with stroke knowledge and its preventive management (78.4%, Table 1).

MUSE and medication-nonadherence attributes

Cronbach's α-coefficient for MUSE was >0.7, whereas that for the MAR-Scale was 0.57, which suggests that these measures had acceptable internal consistency suitable for the Malaysian stroke-patient population. The prevalence of poor MUSE among patients with stroke in this study was 46.5% with mean MUSE score of 25.32±4.18,

Table 1 Sociodemographics and health information of patients with stroke (n=282)

	n (%)
Sex	
Male	189 (67)
Female	93 (33)
Age-group (years)	
≥60	123 (43.6)
40–59	137 (48.6)
≤39	22 (7.8)
Mean ± SD	57±12
Ethnicity	
Malay	155 (55)
Chinese	46 (16.3)
Indian	74 (26.2)
Other	7 (2.5)
Education level	
Primary	67 (23.8)
Secondary	156 (55.3)
Tertiary	55 (19.5)
None	4 (1.4)
Health-literacy	
Adequate	182 (64.5)
Limited	100 (35.5)
Type of stroke	
Ischemic	188 (66.7)
Hemorrhagic	7 (2.5)
Transient ischemic attack	87 (30.9)
Stroke risk (comorbidities)	
Hypertension and other risks*	274 (97.2)
Diabetes only	8 (2.8)
Types of prescribed medication	
≤2 types	23 (8.2)
≥3 types	259 (91.8)
Exposure to stroke and preventive information	
Yes	221 (78.4)
No	61 (21.6)

Notes: *Inclusive of one, two, or more stroke-risk factors, eg, diabetes, hyperlipidemia, atrial fibrillation.

whereas prevalence of medication nonadherence was 53.9% with mean number of issues of 1.24±1.41. Within-case analysis showed prevalence of low LM self-efficacy of 29.1% with mean score of 10.01±1.16, whereas prevalence of low self-efficacy in TM was 36.2%, with a mean score of 9.96±1.09. Beliefs about medicine (74.02%) was the commonest reason for medication nonadherence, followed by medication-managing issues (44.8%) and forgetful and convenience issues (40.25%). A total of 97 nonadherent patients (62.9%) had a minimum of one belief about medicine as a nonadherence factor. The primary factor for ischemic stroke for the majority of these patients was hypertension. As such, only blood pressure was analyzed and reported. Other blood parameter, eg, HBA_{1c}, low-density lipoprotein, and international normalized ratio, are not reported, as some medical records were unavailable and the sample too small for significant analysis.

An initial analysis (unadjusted) using Pearson's χ^2 was performed to identify associations between patient sociodemographic characteristics, stroke treatment, and medication adherence with MUSE (Table 2). In this analysis, MUSE was dichotomized to "poor" and "good", whereby total scores >22 were considered good, provided that LM and TM total scores were each >11 (with the assumption that each question was scored 3 or 4 according to the authors' preliminary clinical practice observation at HKL). Similarly for the MAR-Scale, those patients who have scored 11 with the assumption that each question was scored 1 were considered to have good medication adherence compared to those whose score was >11, who were classified as having poor medication adherence.

MUSE scores were significantly associated with positive and strong relationships with medication-adherence scores (Cramér's V/φ=0.548, P<0.001). Patients with poor MUSE scores were more likely to develop poor medication adherence (OR 12.44, P<0.001) than those with good MUSE scores. MUSE scores were significantly associated (negative correlation) with all adherence-category scores; however, the strength of their relationship was stronger for management issues and beliefs about medication than multiple-medication issues and forgetfulness/convenience issues. Interestingly, only health literacy was significantly associated with MUSE (Cramér's V/φ=–0.276, P<0.001) compared to other sociodemographic and treatment criteria, such as age, sex, medication quantity, exposure to stroke education, and blood-pressure control. Further bivariate analysis showed a significant association with positive correlation of moderate strength (Cramér's V/φ=0.472, P<0.001) between health literacy and education background.

Similarly to MUSE analysis, health literacy and education background were factors significantly associated with medication adherence; however, age (Cramér's V=0.182, P=0.003) and exposure to stroke education (Cramér's V=0.123, P=0.043) were also significantly associated with medication adherence, but with weak negative correlation. There were significant differences in distribution

Table 2 Association of sociodemographics, stroke treatment, and medication-nonadherence reasons with Medication Understanding and Use Self-Efficacy Scale (MUSE) scores

	Poor MUSE, n (%)	Good MUSE, n (%)	OR	95% CI	*P*-value	Cramer's *V*
Sex						
Male	89 (47.1)	100 (52.9)	1.08	0.66–1.78	0.760	0.018
Female	42 (45.2)	51 (54.8)				
Age-group (years)						
≥60	64 (52.0)	59 (48.0)	1.49	0.93–2.39	0.099	0.098
≤59	67 (42.1)	92 (57.9)				
Health literacy						
Limited	65 (65.0)	35 (35.0)				
Adequate	66 (36.3)	116 (63.7)	0.31*	0.18–0.51	<0.001*	0.276[a],*
Medication						
≤2 types	11 (47.8)	12 (52.2)	1.06	0.45–2.49	0.890	0.008
≥3 types	120 (46.3)	139 (53.7)				
Blood pressure						
Controlled	35 (42.2)	48 (57.8)	0.78	0.46–1.29	0.320	0.060
Uncontrolled	93 (48.7)	98 (51.3)				
Stroke education						
Yes	96 (43.4)	125 (56.6)	0.57	0.32–1.01	0.053	0.115
No	35 (57.4)	26 (42.6)				
Medication-nonadherence reasons						
Management issues						
Yes	58 (84.1)	11 (15.9)				
No	73 (34.3)	140 (65.7)	0.10*	0.05–0.20	<0.001*	0.429[a],*
Multiple-medication issues						
Yes	44 (73.3)	16 (26.7)				
No	87 (39.2)	135 (60.8)	0.23*	0.13–0.44	<0.001*	0.280[a],*
Beliefs about medications						
Yes	80 (70.2)	34 (29.8)				
No	51 (30.4)	117 (69.6)	0.19*	0.11–0.31	<0.001*	0.392[a],*
Forgetfulness and convenience issues						
Yes	46 (74.2)	16 (25.8)				
No	85 (38.6)	135 (61.4)	0.22*	0.12–0.41	<0.001*	0.295[a],*
Medication adherence						
Good	22 (16.9)	108 (83.1)				
Poor	109 (71.7)	43 (28.3)	12.44*	6.98–22.19	<0.001*	0.548*

Notes: Pearson Chi Square test, *Statistically significant, [a]Phi (negative).

(*P*<0.001) between MUSE categories with medication adherence, health literacy, and education attainment, whereas for medication-adherence categories, there were additional significant differences in distribution (*P*<0.001) with age and exposure to stroke education apart from MUSE scores, health literacy, and education background.

Independent variables of sociodemographic criteria, stroke treatment, and medication adherence were examined concurrently in the multinomial logistic regression, as presented in Table 3. The final model with adequate R^2 and the model fitting information (Nagelkerke's R^2=0.515, *P*<0.001) predicting percentage correct (71.3%) estimated gross effects of selected independent variables on MUSE. Likelihood-ratio tests identified four variables that were significantly associated with MUSE categories. They were health literacy (*P*=0.010) and three adherence categories:

managing issues (P<0.001), beliefs about medicine (P=0.007) and forgetfulness/convenience issues (P=0.009). There were marginal discrepancies between the "Both LM and TM poor" and "Either LM or TM poor" categories with reference to the "Both LM and TM good" category. In the "Both LM and TM poor" category, patients with stroke were more likely to have health-literacy problems and all medication-adherence issues than patients who were in the "Either LM or TM poor" group, who were only more likely to have two medication-adherence issues: managing issues and forgetfulness/convenience issues. Further analysis discovered that with other independent variables held constant, the odds of patients not having medication-managment issues and forgetfulness/convenience issues and being in the "Either LM or TM poor" group rather than the "Both LM and TM poor" group were approximately twice those of patients with these issues.

Discussion

The prevalence of medication nonadherence in this study (53.9%) was comparable with another Malaysian study[36] and relatively lower if compared to a recent study by Ganasegaran et al.[13] However, there have been no substantial reports on poor MUSE prevalence (46.5%) in other studies of similar population. Differences in medication-nonadherence prevalence could be attributed to discrepancies in population samples, methodologies, and outcome measures across all related studies locally and internationally.[12] For example, it is a norm for Asian and developing nations with different health systems to adopt self-report measures to assess medication adherence compared to their counterparts from developed nations, who have resources and access to established pharmacy refill data. Nevertheless, since medication nonadherence is a dynamic process that involves multiple behavioral attributes,[37] the use of reliable outcome measures is warranted.

This cross-sectional study supports the hypothesis and findings of Cameron et al,[31] higher scores on MUSE correspond with higher medication adherence, despite variances in population sample and methodology. It is more likely that a patient with high self-efficacy in understanding and using prescribed medication appropriately has a higher tendency to adhere to medications and vice versa.[38] According to Bandura,[17] self-efficacy influences a person to reflect and make efforts that then emotionally and motivationally react toward a particular action.[39] It is a crucial construct as a cognitive process of the social cognitive theory,[40] which can predict positive health behavior in patients with chronic illnesses, despite various challenges in being adherent.[41–43] However, self-efficacy is influenced by such factors as experiences and gained skills, role models and motivation, verbal persuasion, or physiological symptoms.[44] As such, it was essential to acknowledge the effect of each construct that contributed to the final MUSE scores related to medication adherence. This effect is apparent in Table 3, whereby potential factors influencing low MUSE scores — poor LM and poor TM self-efficacy — were health literacy, beliefs about medicine, multiple medication issues, medication-management issues, and forgetfulness/convenience issues.

Sociodemographic factors, such as age and exposure to stroke education, were only significantly associated with medication adherence compared to MUSE, so we considered these attributes as potential confounding factors. However, surprisingly blood-pressure control was not at all associated with both medication adherence and MUSE. There have been mixed results from previous studies refuting the view that older age correlates with medication nonadherence.[45] Nonetheless, knowing that stroke risk increases with age and comorbidity incidence is higher among the elderly, the possibility of medication nonadherence was significant in our study outcomes and thus debatable.[46] Exposure to stroke awareness and educational materials play an important role in self-efficacy and medication adherence, but on the contrary our findings were insignificant for MUSE if compared to other studies.[47–50] This paradoxical result could be attributed to a likelihood that the success of patient education depended on the type of information and mode of delivery. A recent video-based educational intervention with patients with stroke resulted in a positive association with improved self-efficacy,[51] which helped to explain this insignificant association. Our sample of patients received various types of information on stroke, hypertension, diabetes, and, hyperlipidemia. The most common mode of delivery was printed materials and oral presentations. Therefore, we had a pool of patients with unpersonalized exposure toward learned skills, whereby merely reading and receiving information was insufficient to boost self-efficacy among stroke patients who were susceptible emotionally. In terms of blood-pressure control, our analysis contradicted recent studies that found poor medication-adherence rates negatively to affect blood-pressure control.[36,52–54] Discrepancies would have possibly occurred due to variance in study objectives, patient samples, and type of intervention. For example, Tan et al compared medication-adherence intervention against blood-pressure improvement among hypertensive patients. The

Table 3 Factors associated with Medication Understanding and Use Self-efficacy Scale using multinomial logistic regression analyses

Independent variables	Coefficient	*P*-value	AOR	95% CI
Both LM and TM poor				
Age				
≥60 years	0.135	0.797	1.144	0.411–3.189
≤59 years[b]				
Sex				
Male	0.872	0.124	2.392	0.787–7.277
Female[b]				
Health literacy				
Adequate	−1.610	0.003*	0.200	0.069–0.581
Limited[b]				
Medication quantity				
≤2 types	0.175	0.879	1.192	0.124–11.452
≥3 types[b]				
Blood pressure				
Controlled	−0.900	0.157	0.406	0.117–1.413
Uncontrolled[b]				
Stroke education				
Yes	−0.062	0.918	0.940	0.290–3.047
No[b]				
Medication-management issues				
No	−2.615	0.000*	0.073	0.020–0.266
Yes[b]				
Multiple-medication issues				
No	−1.273	0.037*	0.280	0.085–0.925
Yes[b]				
Beliefs about medication issues				
No	−2.033	0.005*	0.131	0.032–0.542
Yes[b]				
Forgetfulness/convenience issues				
No	−1.755	0.006*	0.173	0.050–0.600
Yes[b]				
Either LM or TM poor				
Age				
≥60 years	−0.206	0.518	0.814	0.435–1.521
≤59 years[b]				
Sex				
Male	0.136	0.676	1.145	0.605–2.167
Female[b]				
Health literacy				
Adequate	−0.423	0.221	0.655	0.333–1.290
Limited[b]				

(*Continued*)

Table 3 (Continued).

Independent variables	Coefficient	*P*-value	AOR	95% CI
Medication quantity				
≤2 types	1.022	0.125	2.779	0.752–10.266
≥3 types[b]				
Blood pressure				
Controlled	−0.171	0.606	0.843	0.441–1.612
Uncontrolled[b]				
Stroke education				
Yes	−0.087	0.826	0.917	0.423–1.987
No[b]				
Medication-management issues				
No	−1.988	0*	0.137	0.056–0.334
Yes[b]				
Multiple-medication issues				
No	−0.137	0.767	0.872	0.351–2.162
Yes[b]				
Beliefs about medication issues				
No	−0.090	0.819	0.914	0.422–1.979
Yes[b]				
Forgetfulness/convenience issues				
No	−1.003	0.025*	0.367	0.153–0.881
Yes[b]				

Notes: The reference category is both LM and TM good; [b]reference group; *statistically significant.
Abbreviations: LM, learningabout medicine; TM, takingmedication.

majority of our patient sample were hypertensive and had varying degrees of comorbidity that were not stratified or controlled for comparison. Our study assessed general medication adherence, which also involved various type of medication inclusive of stroke-preventive medication. Therefore, it is necessary that each type of medication is explored for its association with MUSE and medication adherence.

In this study, health literacy showed a positive association with MUSE and medication adherence, which corresponded with other research.[55–57] In contrast, some studies contradict these findings, as they found no association, even though a similar health-literacy scale (Newest Vital Sign) was used in one of the studies. Plausible explanations of discrepancies have been sample size, different population and disease characteristics, and dissimilar self-efficacy measures.[58,59] Interestingly, study analysis also found a significant relationship between health literacy and educational attainment, which were positively associated with MUSE and medication adherence.[60,61] However, making education attainment a prerequisite focus for medication self-efficacy interventions would require further research, as its outcome may be subject to confounding factors, such as socioeconomic and motivation status and skill–practice sustainability.

The self-efficacy concept is also an addition to the health belief model, which proposes a readiness to act of individuals based on perception: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers.[18] Perceived susceptibility and severity are driven by knowledge, health practices, and beliefs about the illness and the symptoms experienced by the individuals or family.[17] In terms of treatment, these perceptions influence one's actions in so far as thinking about the advantages of adhering to medication outweighing its disadvantages. As such, beliefs about medicines are strongly associated with medication adherence. Our data on the association of self-efficacy in understanding and taking medication appropriately with beliefs about medicine were comparable with studies that proved a similar effect on medication nonadherence.[62–64] However, according to McCulley et al,[65] patients with higher self-efficacy had poor adherence. Their findings tallied with patients from the "Either LM or TM poor" group compared to patients from other groups. It is possible these results cannot be generalized to the whole population, due to a diverse sample and research methodology. Nonetheless, we concluded that if this relationship remains constant, a specific group of stroke patients were perhaps confident in their health practices or alternative treatments, and thus opted not to adhere to prescribed medications.[66] These discoveries show that further research is necessary to explore underlying factors leading to these phenomena.

Medication-management issues were associated with all MUSE categories, which depended very much on the ability of individuals to be responsible in applying skills to learn, plan, and ensure the right prescribed medications were taken appropriately for optimum health outcomes. These findings are consistent with studies that proved the ability to reflect medication-taking actions and to seek resources to improve one's condition is of utmost importance in differentiating individuals with high self-efficacy from those without.[67–69] Despite these impressive results, we concluded medication-management issues were not a standalone influencer, as they could also be related to other underlying confounding attributes, such as forgetfulness and convenience issues, which requires further exploration. There were possibilities that forgetfulness issues were caused by the aging factor.[70] However, another study contradicts this, proving that it was perceived low memory causing perceived forgetfulness wherein literacy and mental health were predisposing factors.[71] Nonetheless, this situation was unavoidable, as the study would have had a patient sample with deteriorating cognitive effects, as they were stroke patients who had higher risks of low memory capacity, causing skewed data.[72,73] Our study showed that multiple-medication issues had a significant positive association with poor MUSE and medication nonadherence. A recent study by Addo et al[74] supports our findings, but another study by Grant et al does not support this association.[75] This study found no association with the number of medications, even though the majority of patients took more than three types of medication. Due to the diversity in types of disease, illness severity, and dosing regimens, this observation is interpreted with caution. As such, it is very subjective to conclude that medication quantity prescribed to stroke patients influences MUSE. Cost-effectiness data for our study were excluded, because all our patient sample received prescribed regimens provided by the hospital from the Ministry of Health's subsidized health scheme.

Study limitations

This cross-sectional study could not establish temporal relationships. Susceptibility of biases of outcome measures could have existed, causing overestimation or underestimation of MUSE, medication-nonadherence prevalence, and determination of factor associations. Generalizability of the results was not established (as depicted by inconsistent confidence intervals), most probably due to samples being from a single site, although significant odds ratios for factors were determined. Other than that, the majority of patients were >50 years old, due to the nature of the disease, which explains the distribution of the final data. Also, our outcome measures were self-administered, which adds more bias. It should be noted that these significant factor interrelations, which were retained in the multinomial analysis of MUSE and medication nonadherence, are still debatable, whereas those excluded factors that existed as confounding elements would require further exploration as potential predictors. The possibility of overlapping questions of different constructs in both outcome measures would have caused close correlation. Nevertheless, self-efficacy in understanding and taking medication, especially when related to medication nonadherence, is a dynamic behavior concern, and thus it was impossible to explore all factors in one study, as this involves cognitive skills, abilities, and beliefs.[76]

Conclusion

This study enabled the identification and determination of potentially modifiable characteristics of medication nonadherence in terms of MUSE among stroke patients. These findings are suggestive that MUSE and medication nonadherence are interrelated, and thus new emerging personalized behavioral interventions are warranted to address the need for improved medication-taking behavior for a specific niche among stroke survivors. It would be interesting to explore interventions based on patient stratification related to MUSE-outcome measures. With this, hopefully, MUSE could be enhanced to promote stroke risk–factor control and long-term reduction of stroke recurrence.

Data-sharing statement

All data available are within the judiciary of the Director General of Health Malaysia and are the intellectual property of Monash University.

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Disclosure

The authors report no conflicts of interest in this work.

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2.3 Summary

It was affirmed that the lack of MUSE among post-stroke patients is an unprecedented issue in our local setting. Furthermore, this study acknowledged the applicability of MUSE as an outcome measure to reflect the medication adherence outcomes for these patients. However, the study inclusion criteria which excluded patients with multiple stroke incidences who could be potential adherers compared to newly diagnosed patients. Hence, further prevalence study is warranted.

Nevertheless, the cross-sectional study had successfully determined several behavioral factors related to medication non-adherence that contribute to poor MUSE. Health literacy and forgetfulness/ convenience factors, though, represent significant modifiable factors, but these elements were considered highly dependent on cognitive ability, physical capability, and availability of appropriate social infrastructure and educational resources. Thus, these factors were decided not to be an appropriate focus of our conceptual framework. However, the study’s findings revealed significant associations of MUSE with their belief about illness and its treatment, and medication managing issues. Hence, the framework focused on strategies to influence post-stroke patients’ perception and belief towards improvement in MUSE. Nevertheless, measures were taken to reduce the impact of significant confounding factors described in Chapters 4,5 and 6.

CHAPTER 3:The development of an intervention to promote MUSE

3.1 Preamble

The thesis, up to this point, has disclosed that belief, perception, and medication managing issues are the relevant modifiable factors that would ensure MUSE changes in this study. Therefore, as related to the conceptual framework, HBM constructs, and medication managing self-efficacy skills build the ‘Information’ phase of IMB. Whereas, for the ‘Motivation’ phase, insight or story from a peer and a provider is crucial to ensure an impactful action, which concludes the ‘Behavioral’ phase. Hence, the intention of the storyteller should be inspiring and focus on delivering behavioral changes to a post-stroke population.

Video narratives are dependent on the art and science of patient storytelling. Narratives must be developed with care because patients’ reflection differs from one another based on their experiences. The narratives’ content should also be carefully selected to be homogenous and adapted to the intended population because of its relativity and sensitivity to the emotion and cultural value. Hence, with much consideration, the HBM content, cues to action, and motivational trigger determined the perception of the patient’s treatment-decision making phase. Therefore, it was crucial for a strategic video narratives development process that involved the validity, reliability, and engagement competence of the audio-visuals. The following paper describes the development and validation procedures.

Original Paper

An Intervention to Promote Medication Understanding and Use Self-Efficacy: Design of Video Narratives for Aging Patients at Risk of Recurrent Stroke

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Abstract

Background: The debilitating effects of recurrent stroke among aging patients have urged researchers to explore medication adherence among these patients. Video narratives built upon Health Belief Model (HBM) constructs have displayed potential impact on medication adherence, adding an advantage to patient education efforts. However, its effect on medication understanding and use self-efficacy have not been tested.

Objective: The researchers believed that culturally sensitive video narratives, which catered to a specific niche, would reveal a personalized impact on medication adherence. Therefore, this study aimed to develop and validate video narratives for this purpose.

Methods: This study adapted the Delphi method to develop a consensus on the video scripts' contents based on learning outcomes and HBM constructs. The panel of experts comprised 8 members representing professional stroke disease experts and experienced poststroke patients in Malaysia. The Delphi method involved 3 rounds of discussions. Once the consensus among members was achieved, the researchers drafted the initial scripts in English, which were then back translated to the Malay language. A total of 10 bilingual patients, within the study's inclusion criteria, screened the scripts for comprehension. Subsequently, a neurologist and poststroke patient narrated the scripts in both languages as they were filmed, to add to the realism of the narratives. Then, the video narratives underwent a few cycles of editing after some feedback on video engagement by the bilingual patients. Few statistical analyses were applied to confirm the validity and reliability of the video narratives.

Results: Initially, the researchers proposed 8 learning outcomes and 9 questions based on HBM constructs for the video scripts' content. However, following Delphi rounds 1 to 3, a few statements were omitted and rephrased. The Kendall coefficient of concordance, W, was about 0.7 (P<.001) for both learning outcomes and questions which indicated good agreement between members. Each statement's Cronbach alpha was above .8 with SD values within a range below 1.5 that confirmed satisfactory content and construct validity. Approximately 75% (6/8) of members agreed that all chosen statements were relevant and suitable for video script content development. Similarly, more than 80% (8/10) of patients scored video engagement above average, intraclass correlation coefficient was above 0.7, whereas its Kendall W was about 0.7 with significance (P<.001), which indicated average agreement that the video narratives perceived realism.

Conclusions: The Delphi method was proven to be helpful in conducting discussions systematically and providing precise content for the development of video narratives, whereas the Video Engagement Scale was an appropriate measurement of video realism and emotions, which the researchers believed could positively impact medication understanding and use self-efficacy among patients with stroke. A feasibility and acceptability study in an actual stroke care center is needed.

Trial Registration: Australian New Zealand Clinical Trials Registry ACTRN12618000174280; https://www.anzctr.org.au /Trial/Registration/TrialReview.aspx?id=373554&isReview=true

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KEYWORDS

Delphi technique; self-efficacy; stroke; personal narratives; video-audio media; beliefs

Introduction

Background

Medication nonadherence is prevalent at large especially in major chronic diseases, despite patient education and advanced knowledge and methods [1]. Regardless of a definite health economic impact, current endeavors of patient education interventions still appear to be inadequate [2]. Globally, stroke prevalence is not exempted from this cliché of medication nonadherence [3]. A similar situation and increasing aging population of poststroke patients in Asian countries, such as Malaysia, urge for robust and cost-effective patient education measures [4,5]. So far, insufficient patient education intervention reported the effects of video education in patients with chronic medical conditions such as stroke. It is also unknown if personal stories related to stroke medication management can enhance self-efficacy and promote adherence to stroke preventative medication or control stroke risk factors.

In educational strategy, 75% of information is engaged visually and about 13% of it is engaged using our hearing senses [6]. Hence, when a patient sees and hears a video, they have a higher probability of comprehending and reflecting the information. Videos delivered via television format allows viewers of any age group to grasp information at a continuous pace or in a relaxed and inducive environment [6].

The researchers proposed a patient education intervention at an outpatient stroke clinic as it may be a perfect venue for focused recurrent stroke education because it provides access to a common variation of people who are at high risk for recurrent stroke. In a quest for cost-effectiveness, the researchers utilized the prolonged waiting time in the clinic as an opportunity to deliver the intervention adjunct to the current medication therapy adherence clinic's (MTAC) effort that may benefit the patients with stroke. Time spent in the waiting area is a potential period for patients to gain knowledge and confidence in managing their medication [7]. This educational approach may be valuable to patients who were not inclined to electronic communication devices, lacking internet facility, or to those who depended on an external motivational environment such as peers.

The researchers believed that video narratives shown simultaneously with patient education modules are expected to have a positive impact on self-efficacy. Consequently, if the video is incorporated with theoretical behavioral constructs, it could induce self-reflection and simulation by a role model. In addition, if the video is repetitively seen, a *persuasive power* would be instilled whereby the individual's perception influenced by previous learning experience would have a change. The Social Learning Theory explains that an individual's behavior depends on the conditioning of the mind, influenced by his or her environment, which then controls the action of the doer [8]. The planned environment here was the video viewing activity in the waiting area of an outpatient stroke clinic. Besides, the role model impact would be more significant if the actual people who experienced the events delivered the video narratives [9]. It makes the content's objectives realizable and might induce the patient's confidence in justifying what was said, seen, or heard in the video.

Objectives

This study hypothesized that providing video narratives incorporated with theoretical behavioral constructs adjunct to the existing MTAC's patient education effort, informational brochures, counseling, and medication review would result in better stroke awareness, medication understanding, and use self-efficacy toward improved adherence. This study was the intervention development and validation phase of a randomized controlled trial (universal trial number: U1111-1201-3955) [10]. This study described the processes involved in the video narrative's development and validation.

Methods

The Delphi Method

The Delphi method originated from RAND Corporation studies from the 1950s and aimed to develop a reliable technique to obtain consensus from experts. Since then, many researchers have applied this organized method for expert problem-solving issues. They have also developed systematic guidelines of the process and analysis of the Delphi Method [11,12].

The researchers in this study applied a Delphi method to obtain anonymous consensus on learning outcomes, Health Belief Model (HBM) constructs, and content of video scripts which took place from October 2017 to December 2017 among experts experienced in stroke patient education. The consensus procedure incorporated 3 rounds of questionnaires via email to finalize expert panelists' viewpoints.

The process started with literature findings on the local need for stroke survivors. Most patients' crucial need encompassed feelings of being independent to have a good quality of life, reducing the severity and preventing recurrent stroke [13-16]. To be able to achieve these aims, the patient would require utmost confidence and self-efficacy. Moreover, the learning objectives must be able to reflect similar insights and align with the objectives of patient education of recurrent stroke preventative treatment and management guideline of Malaysia [14,15].

Fundamentally, the design of the content was based on the most widely used framework, HBM [17]. HBM has outlined few health behavior constructs that guide a patient's decision making ability such as perception of the risk of contracting the illness and how an adverse effect of illness affects their life, balancing the pros and cons of the actions if taken and prompts for the action. These HBM conditions led the researchers to develop an ideal set of questions as learning objectives to develop the video scripts. Other than scripts, presenting it as a video format was a valuable prompt for the patients with stroke *to take action* on their medication-taking habit.

The core of the Delphi method was the selection of a knowledgeable and experienced expert panel of members within the specific need of content development [18]. Therefore, the researchers invited members of the stroke community and health care professionals who then gave consent via email after provision of information and a brief explanation by the researchers.

The expert panel team of 8 comprised 2 neurologists, 2 pharmacists, 2 medical educationists, and 2 patients who had experienced a stroke. The neurologists were selected based on their 10 to 12 years of professional experience of diagnosing and prescribing medications to patients with stroke. The pharmacists were also selected based on their 10 to 12 years of professional experience of reviewing and dispensing prescribed medications to patients with stroke at the hospital and community level. Whereas, the medical educationists, who were also knowledgeable in developing curricular pedagogy, contributed to the suitability of learning outcomes for stroke according to local context and sensitivity. Finally, the patients with stroke for about 5 years had experiences and an awareness of the need for emotional support to enhance self-efficacy.

There is no specific sample size recommendation for the Delphi method in this area of study as different disciplines and purpose of discussion often result in dissimilar response rates and time [19,20]. However, the researchers ensured all members were homogenous of a specific niche for content development [18] as each of them were bilingual, had relevant knowledge about stroke, were well-versed in stroke preventative management and actively involved with the latest stroke research update and stroke community undertakings, and were willing to volunteer to respond to up to 3 rounds of discussions.

The Development of the Video Narrative Scripts

A fruitful discussion with the panel of experts led to the video narrative script development. The researchers developed the scripts in English and translated them into the Malay language with the help of a professional bilingual translator. Then, back translation was performed by another bilingual researcher who was not exposed to the initial scripts to verify the similarity of meanings. Both scripts (a neurologist's and a patient's version) addressed a brief summary of (1) the debilitating impact of stroke; (2) related risk factors of recurrent stroke, its prevention strategy, and benefit; (3) belief in self-confidence; and (4) real-life cues of successful recovery regardless of the severity of stroke. The Flesch-Kincaid reading level for the narrative scripts scored an average grade level of 6 [21]. Though each script was short (planned to be narrated within 2 min), it was precise with motivational aspects according to the behavioral constructs and was presented as a self-reflection story.

The Development of the Video Narratives

The researchers believed that it was ideal and realistic to have actual actors (ie, neurologist and a patient who had experienced a stroke) to narrate the scripts. Meanwhile, the video was taken at the Arts and Social Sciences School, Monash University, Malaysia, with the help of a technical officer. They narrated each video script, both in English and Malay language within 2 min, and the manner of speech was according to communication principles [22]. The narration and video footage were at a sensible pace with several pauses and facial expressions showcasing appropriate emotion. The researchers also highlighted the videos with written captions and subtitles with a readability level of 6 [21]. A freelance video designer edited the videos using Movavi Video Editor 14 (Version 10.0.0; Obscure Reference Generator (Version 2.1; Shareware, 2014). The videos were repeatedly edited after several rounds of comments on visuals, sound clarity, and presentation style.

Data Collection and Analysis

Delphi Method: Round 1

The researchers drafted the initial narrative script content guide from literature findings, which comprised 8 learning outcomes and 9 HBM-related questions linked to individual perceptions, cues to action, the likelihood of action, and self-efficacy. The panel of experts was given options (ie, yes: to agree to accept or no: do not agree to accept) and an open-ended question to add any other relevant information to the list or justify any redundancy. Hence, this round helped to establish the initial content and construct development of the list, clarification of meaning, and rephrasing or merging of a redundant statement. They were given 3 weeks' time to respond to the Delphi method coordinator.

It was accepted that, approximately, an 80% agreement from the panel (ie, 6 or 7 out of 8 experts) for response frequencies for each learning outcome and HBM question was to be accepted or omitted. This percentage cut off was an appropriate reference point to attain content and construct validity [23]. Hence, the researchers removed those statements that were not meeting about 80% agreement, whereas the rest of the statements and HBM construct questions were modified, rephrased, or merged based on the experts' feedback. Then the list was reedited in a survey questionnaire format and was emailed to the experts for Delphi method round 2.

Delphi Method: Round 2

The researchers repeated the same procedures and timeline as the previous discussion except that the panel of experts was asked to rank the level of relevance using a 7-point Likert scale (ie, 1: not at all relevant and 7: extremely relevant). They were asked to justify their choice of rank if it was 4 points and lower. Kendall W coefficient of concordance was used to measure the nonparametric rankings [24] for a better affirmation of content and construct validity. According to Kendall, the W value ranges from 0 to 1 (ie, 0: no consensus and 1: full consensus) with 0.7 and greater indicating strong agreement so that specific weaker agreement could be scrutinized and relooked to avoid bias and force agreement. Besides, an SD of below 1.5 was also considered to add value to the consensus compared with a percentile of agreement [25]. *P* values less than .05 are considered statistically significant.

The coordinator received comments and feedback to rephrase a few statements to illustrate appropriate meanings. The coordinator asked the expert panelists if they were willing to continue the rounds until the W value rises and all agreed. Hence, a final edition of learning outcomes and HBM questions were resent via an online survey questionnaire for the Delphi method round 3 discussion.

Delphi Method: Round 3

Round 2 discussion and analysis produced a summary of responses and clarification from the panel of experts, which gave an overall picture of final scoring and the current level of consensus of the *weaker strength* statements. The coordinator decided to run the final round of discussion, round 3, and the purpose was to hint the panel experts to confirm and justify revision of specific individual scores, which showed some discrepancies. Inter-rater reliability was determined with the ICC, whereby a 2-way mixed model (fixed raters) with absolute agreement was applied. An ICC value with 0.7 and greater indicated moderate to good reliability. W and SD values were then calculated, and subsequently, a full-detailed report of the discussion was sent to all expert members.

The Validity and Reliability of Video Narrative Scripts and Videos

A purposeful sample of 10 bilingual patients with stroke (within the inclusion and exclusion criteria of the trial) were requested to provide written feedback on the comprehension of the English and Malay video narratives scripts. The informed and consented patients were asked to reply either via email or via a prepaid postal service. Their responses contributed to face and content validity. They also viewed the video narratives in both languages and responded to the Video Engagement Scale (VES) that was presented to them face-to-face during their follow-up clinic visit. Test-retest was not appropriate as these patients were exposed to patient education materials, which could affect their follow-up responses. We expected occurrences of revision in every round of iteration. Therefore test-retest was not applicable to the Delphi method.

To the researchers' knowledge, there were no fixed guidelines to validate a video narrative for patient education; however, there has been a link between the construct of engagement and persuasive communication [26]. Therefore, the researchers adopted the VES to obtain feedback on the ecological validity of the video narratives [27]. The VES has been validated with right internal consistency, test-retest reliability, and content validity, and the authors suggested to use it to measure ecological validity and external validity of video vignettes [27]. VES was also developed based on videos with multiple cases and shots; therefore, this scale would be suitable to be related to emotion and motivation. The patients' ratings contributed to the ICC and Kendall W value, whereas Cronbach alpha above .7 indicated the accepted internal consistency of response ratings. All statistical analyses were done using IBM SPSS software version 22). Data preprocessing was done to maintain data quality such as normalization and double data entry to prevent errors, missing values, or inconsistent codes.

Ethics Approval

Approvals for this development and validation study have been obtained from the Malaysian Medical Research and Ethics Committee (NMRR ID-15-851-24737) and the Monash University Human Research Ethics Committee (ID 9640) whereas the MyStrokeStory trial was registered with the Australian New Zealand Clinical Trials Registry (ACTRN12618000174280; universal trial number U1111-1201-3955).

Results

The Delphi Method

The researchers made no addition to the initial draft of the learning outcomes and HBM questions before the Delphi method round 1. We omitted statements that were redundant, had less than 80% agreement (ie, What is a stroke? How serious is having a stroke?), or were rephrased (ie, How common is a stroke? to Who is at high risk of stroke?). Whereas, few other statements or questions had only a minor correction. Therefore, 8 learning outcomes and 9 HBM questions were edited to 6 statements with 6 questions each for the Delphi method round 2.

In round 2, the W value was below 0.7. The mean ranking for learning outcomes and HBM questions also varied (ie, 2 experts were asked to justify their low score for learning outcomes and HBM construct questions 1 and 2).

However, in round 3, the list of learning outcomes and HBM questions was finalized (Table 1). Kendall coefficient of concordance, W, of approximately 0.7 indicated a firm agreement, and SD values below 1.5 confirmed satisfactory content and construct validity of learning outcomes and HBM questions. However, a reliability test was computed independently for round 3, whereby Cronbach alpha was above .7, which indicated good internal consistency; items on the finalized learning outcomes and HBM construct questions were developed on the similar idea or construct (Table 2).

The Validity and Reliability of Video Narrative Scripts and Videos

The researchers received positive feedback on the scripts (ie, good script, short and meaningful, and direct points), but there were not many comments on the structure of sentences or usage of words. Therefore, the researchers concluded that the scripts were suitable to the local context; hence, the narrative scripts were finally confirmed.

Table 1. The finalized video narrative scripts' learning outcomes and questions parallel with the Health Belief Model constructs.

Health Belief Model constructs	Learning outcomes	Questions
Individual perception: Perceived susceptibility; Perceived severity	1. To be able to recognize and understand stroke cause, symptoms, and effects 2. To understand the burden of stroke	1. What happens to you when you have a stroke? 2. Who is at high risk of stroke?
Likelihood of action: Perceived benefit; Perceived barrier	3. To understand lifestyle risk factors of stroke 4. To acquire information in medication understanding and use	3. How do you prevent another stroke? 4. How do medications reduce the risk of another stroke?
Self-efficacy	5. To understand and acquire skills of medication understanding and use self-efficacy after a stroke	5. How do you ensure your medication works for you?

Table 2. Final analysis of the Delphi method (n=8).

Raters	10 items, mean[a,b,c]
Member 1	4.4
Member 2	6.2
Member 3	4.6
Member 4	4.4
Member 5	5.5
Member 6	3.4
Member 7	5.4
Member 8	5.4

[a]Cronbach alpha: .908.

[b]Intraclass correlation coefficient (95% CI): 0.733 (0.384-0.919).

[c]*P*<.001.

Table 3. The Video Engagement Scale scores (n=10).

Raters	15 items, mean[a,b,c]
Patient 1	5.3333
Patient 2	5.6000
Patient 3	5.7333
Patient 4	5.9333
Patient 5	6.4000
Patient 6	6.5333
Patient 7	6.7333
Patient 8	6.8667
Patient 9	6.8667
Patient 10	6.6667

[a]Cronbach alpha: .925.

[b]Intraclass correlation coefficient (95% CI): 0.797 (0.572-0.921).

[c]*P*<.001.

The VES scores were above average, which exhibited a good link with perceived realism (Table 3). Out of 10 patients, more than 80% of them agreed on the validity of emotional and motivational aspects of the video narratives with a Kendall W value of 0.63 and SD average below 1.5. However, the Cronbach alpha above .7 indicated satisfactory reliability for all videos, which indicated good internal consistency; the emotional and motivational levels were on a similar agreement.

Discussion

Principal Findings

This study explicitly developed and validated video narratives to be used as intervention materials in a randomized controlled trial [10] whereby the researchers would be able to monitor the effect of narration from a doctor and patient with stroke on medication understanding and use self-efficacy of patients who have experienced stroke. The scripts were a general reflection of recurrent stroke and its underlying comorbidity management with a mix of motivation and advice, which hoped to trigger a sense of self-efficacy among patients with stroke to understand and use prescribed medication. The video narratives underwent rigorous processes (ie, development of script guidelines as in learning outcomes and HBM questions, bilingual script development, and video editing) and few phases of satisfactory validation: face validity, content and construct validity (Delphi method), reliability test, and ecological validity (video engagement with bilingual patients). Hence, these video narratives were considered valid and reliable to be presented to patients with stroke with a projected aim to avert stroke risk factors and, in the longer term, prevent recurrent stroke. Videos with patient narratives have the persuasive strength of behavior modification especially if culturally sensitive and embedded with a role model effect. Professional actors, good script constructs and content, appropriate language, and video presentation style play a part in delivering an impactful source in a behavioral intervention [28-30].

Strength and Limitations

There were some apparent limitations in this video narrative development. Face-to-face discussion was unable to be carried out in the Delphi method rounds owing to the lack of interval time and slow responses from the expert panel despite constant reminders. Hence, the Delphi method discussion ended in round 3 whereby force agreement would have occurred. The researchers were also aware that face validity and video engagement responses lacked the required number of participation from poststroke patients because of specific inclusion and exclusion criteria via purposive sampling method. Therefore, the video narratives' validation and study aim were skewed toward particular samples only, and hence, results could not be generalized to the whole population of patients with stroke. In addition, responses from nonbilingual patients were also not assessed owing to the delay during the purposive sampling period and having the VES available in the English version only.

Nevertheless, the Delphi method proved to be a versatile and helpful technique in conducting discussions systematically and reaching a consensus unanimously, eliciting precise ideas, and providing rich, in-depth data in defining an intervention strategy. In addition, the video narrative development processes were found to be useful as a guideline for other behavioral studies, which use video as their intervention, samples with chronic illness, and study sites other than health care centers.

The researchers believed that *no stone had been left unturned* in this development and validation process. The VES had helped to reveal the preliminary understanding of the patients' video engagement styles and emotions that were being affected (ie, realism, empathy, and awareness); however, we believed that bigger samples would produce far more significant data. The researchers recommend that the VES be summarized and translated in various languages in the future to test its effectiveness in distinguishing the video engagement style of multicultures. A future test of the video narratives' feasibility and acceptability in an actual stroke care center would undoubtedly add significance to its validation and effectiveness.

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Conflicts of Interest

None declared.

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Abbreviations

HBM: Health Belief Model
ICC: intraclass correlation coefficient
MTAC: medication therapy adherence clinic
VES: Video Engagement Scale

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3.3 Summary

The video narratives were considered appropriate for post-stroke aging patients, with a majority of them above the age of 40 years old in Malaysia. It was a challenge to minimize technical errors and to obtain expert committee volunteers to review the theoretical constructs and narratives. We appreciate their time and dedication to respond for several rounds of discussion via the Delphi method despite their busy schedule and work load. Thus, the successful development of video narratives with satisfactory validation and engagement criteria assured that media technology is versatile and easy to be adapted to suit a target population such as stroke. Also, the actual storytellers, the doctor, and his patient who have delivered their narration created an impactful, empathetic, and realistic situation. Thus, the video narratives had the persuasive power to modify behavioral barriers related to patients' culture and beliefs. Nevertheless, we presumed that it was best to field test the video narratives intervention. The subsequent paper describes the RCT protocol of the 12 months trial.

CHAPTER 4:Establishing a randomized controlled trial (RCT) study protocol

4.1 Preamble

Upon developing the video narratives, there was a need to survey its applicability. Therefore, the research progressed towards establishing the intervention’s procedures. With that said, a randomized controlled trial protocol served as a pivotal role in ensuring the success of the planned conceptualized framework of intervention. Moreover, the protocol ensures the safety of trial subjects with the approval by the ethics committees. The protocol outlined a one year RCT with the consideration of focused objectives, sampling criteria, methods, outcome measures, data analysis, and warrants the integrity and confidentiality of data. This following paper brings forth the protocol of this RCT.

Study Protocol Clinical Trial

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The effectiveness of culturally tailored video narratives on medication understanding and use self-efficacy among stroke patients

A randomized controlled trial study protocol

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Abstract

Introduction: A substantial number of the world's population appears to end with moderate to severe long-term disability after stroke. Persistent uncontrolled stroke risk factor leads to unpredicted recurrent stroke event. The increasing prevalence of stroke across ages in Malaysia has led to the adaptation of medication therapy adherence clinic (MTAC) framework. The stroke care unit has limited patient education resources especially for patients with medication understanding and use self-efficacy. Nevertheless, only a handful of studies have probed into the effectiveness of video narrative at stroke care centers.

Method: This is a behavioral randomized controlled trial of patient education intervention with video narratives for patients with stroke lacking medication understanding and use self-efficacy. The study will recruit up to 200 eligible stroke patients at the neurology tertiary outpatient clinic, whereby they will be requested to return for follow-up approximately 3 months once for up to 12 months. Consenting patients will be randomized to either standard patient education care or intervention with video narratives. The researchers will ensure control of potential confounding factors, as well as unbiased treatment review with prescribed medications only obtained onsite.

Results: The primary analysis outcomes will reflect the variances in medication understanding and use self-efficacy scores, as well as the associated factors, such as retention of knowledge, belief and perception changes, whereas stroke risk factor control, for example, self-monitoring and quality of life, will be the secondary outcomes.

Discussion and conclusion: The study should be able to determine if video narrative can induce a positive behavioral change towards stroke risk factor control via enhanced medication understanding and use self-efficacy. This intervention is innovative as it combines health belief, motivation, and role model concept to trigger self-efficacy in maintaining healthy behaviors and better disease management.

Trial registration: ACTRN (12618000174280).

Abbreviations: ANZCTR = Australian New Zealand Clinical Trials Registry, BIPQ = Brief illness perception questionnaire, BMQ = Belief about medicine questionnaire, BP = blood pressure, CVD = cardiovascular disease, HBM = Health Belief Model, HKL = Hospital Kuala Lumpur, IBM SPSS = International Business Machines Statistical Package for the Social Sciences, IMB = Information-Motivation-Behavior, INR = international normalized ratio, LDL-C = low-density lipoprotein cholesterol, MREC = Medical Research and Ethics Committee, MTAC = Medication Therapy Adherence Clinic, MUHREC = Monash University Human Research Ethics Committee, MUSE = Medication understanding and use self-efficacy, SF-36 = Short Form (36) Health Survey, SKT = Stroke knowledge test, SMS = short messaging service, SPIRIT = Standard Protocol Items: Recommendations for Interventional Trials, T0 = 0 month; baseline, T1 = 3rd month from baseline, T2 = 6th month from baseline, T3 = 9th month from baseline, T4 = 12th month from baseline, TIA = transient ischemic attack, UTN = universal trial number.

Keywords: culturally tailored video narrative, Health Belief Model, Information-Motivation-Behavior model, medication understanding and use self-efficacy, patient education, randomized controlled trial, stroke

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The authors declare they have no competing interests.

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1. Introduction

Stroke has been an enormous burden of disease at the global scale with upper-middle-income countries recording the highest prevalence, followed by lower-middle-income and high-income nations, as reported by the global statistics in 2012.[1,2] A substantial number of the population ends with moderate to severe long-term disability after stroke.[3] Up to a quarter of people who experience a transient ischemic attack (TIA) or stroke will proceed to recurrent stroke within a few weeks or months.[4] An alarming morbidity rate due to stroke could paralyze the economic growth caused by incurring treatment expenses and loss of workforce.[5] Modifiable recurrent stroke risk factors (e.g., hypertension, diabetes, and hyperlipidemia) and non-modifiable risk factors, such as sex, age, and familial history, are added-on with barriers to adherence to medication, which could cause a substantial loss in terms of money, time, and effort of various stakeholders.[6–9] Besides, a recent study associated adherence to recurrent stroke preventative medication with reduced stroke occurrence.[10]

An estimate of 40,000 acute stroke cases are recorded yearly in Malaysia, and about 23% of hospitalization cases referred to patients with a history of recurrent stroke.[11] Approximately, ischemic incidence have been reported to increase annually by 29.5%, while almost 18.7% for hemorrhagic stroke.[12] In total, 33% from acute strokes end with moderate to severe disability. Mortality and morbidity rates of stroke have remained high due to the aging of the population.[11] Hence, stroke recurrence initiatives seem to focus on combatting modifiable risk factors adapted via behavioral interventions.[13,14] While neurologists prescribe preventative stroke medications, a critical component of effective modifiable stroke risk factor control rests with the individual.

The increasing prevalence of stroke across ages in Malaysia have led to the adaptation of medication therapy adherence clinic (MTAC) framework to assist patient care after being discharged from outpatient clinics.[15] Patient education, as a construct of MTAC, addresses modifiable individual behavioral factors identified during clinic appointments. However, limited resources are at grasp regarding the type of intervention that may enhance medication understanding and use self-efficacy so as to promote medication adherence, especially for diseases with various underlying comorbidities, such as stroke.

A highly activated individual takes the effort to acquire disease-specific knowledge and self-efficacy, which lead to engagement in positive health behavior.[16–18] Self-determination theory developed by Deci and Ryan[19,20] explains that without external influences, there is a link between human motivation and personality characteristics with basic needs of satisfaction among patients. They have classified self-motivation into; intrinsic and extrinsic motivation. Intrinsic motivation involves the person engaging in a behavior as he or she finds the activity enjoyable, whereas extrinsic motivation occurs when the person is motivated to modify behavior to earn a reward or to avoid negative consequences.[19,21] Hence, if the person is highly motivated, adhering to a specific medication regime would be a simple routine, otherwise it would be a burden that can affect one's quality of life.

Information-Motivation-Behavior (IMB) is a notable health behavior change framework applicable to patient education intervention.[22,23] Adaptation of IMB model in patient education delivered via information technology, audio-visual, and personalized counseling reported significant behavioral changes.[24–26] The information provides knowledge about risk factors and types of behavior or barriers towards adherence. Motivation is comprised of personal attitude, belief, and perception towards activation of the individual response, while behavioral skills are specific learning skills that enable positive behavior modification. On the other hand, self-efficacy influences the patient's confidence towards the final execution of an action concerning healthy lifestyle and medication management.[22,27]

Within the context of IMB, the foundation of information developed using health belief model (HBM) constructs would deliver a system that enhances understanding and self-efficacy of the patient towards better medication management.[28,29] HBM suggests that individuals protect their health depending on their belief of susceptibility to a disease condition, that the occurrence of their disease condition would have an impact on their quality of life. With that aim, they have options for actions to avoid their perceived disease condition. Additionally, HBM suggests that individuals consider benefits of taking the planned action which outweighs their costs.[30,31] Therefore, patient education intervention should adapt behavioral theories and framework for further exploration of disease risk factor control.

With IMB and HBM to be adopted as the conceptual frameworks, the study is projected to evaluate the impact of patient education on medication understanding and use self-efficacy delivered via video narrative. Video narrative is a useful tool that provides knowledge, improves confidence, and promotes self-learning among patients with various diseases.[32,33] Narratives, as personal stories from comrades or professionals, are seen as motivator, persuader or a role model for other patients to react to their behavior.[34] It can also overcome resistance and facilitate information processing.[35] Thus, a doctor's narrative would be a source of a genuine informant supplementing a patient's story that is believed to strengthen motivation towards behavioral changes so as to minimize the detrimental psychological effects of stroke.

Based on prior studies, stroke risk factors were sequenced in descending order starting with the most prevalent risk factor; hypertension, diabetes mellitus, hyperlipidemia, ischemic heart disease, and history of a previous stroke; thus demanding the need for focused efforts to reduce recurrent stroke prevalence.[36,37] To the researchers' knowledge, various studies have faced considerable challenges to motivate stroke patients due to their varied perspectives regarding stroke severity and medication management. Therefore, this study hypothesizes that narratives developed on behavioral constructs, framework, and experiences of doctors and patients possess the ability to generate substantial expected outcomes. Thus, the study will disclose the specific challenges of medication management among recurrent stroke patients for whom the planned intervention would be most beneficial.

2. Materials and methods

2.1. Study design and aim

This is a single-blind, randomized controlled, parallel group, longitudinal, and exploratory trial in which patients with risk of recurrent stroke will receive either a video narrative and standard care or standard care alone. This study is due to start in the month of May 2018. The study outcomes are assessed as follows; at baseline: T0, 3 months: T1, 6 months: T2, 9 months: T3, and 12 months: T4, as outpatient follow-up. The design and the conduct of the study conform to the revised Consolidated Standards of

Reporting (CONSORT) guidelines[38] and adheres to Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT)[39] Approvals have been granted from the Malaysian Medical Research and Ethics Committee—MREC (NMRR ID-15-851-24737) and the Monash University Human Research Ethics Committee—MUHREC (ID 9640), while the study is registered with the Australian New Zealand Clinical Trials Registry—ANZCTR (ACTRN12618000174280) with Universal Trial Number (UTN) U1111-1201-3955. The research ethics committee and trial registry are notified if there are updates or protocol amendments. The study will be administered at the Neurology Department of Hospital Kuala Lumpur (HKL) in partnership with Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia.

The primary aim of the study is to determine if integrating a video narrative of a doctor and a patient into the standard patient education and counseling procedure will improve medication understanding and use self-efficacy, in comparison to the current standard patient education and counseling procedure. Here, the impact of reinforcement (e.g., repetition after 3 months' interval at T1 and T2) will also be determined. Next, the secondary aim of this study is to explore the relationship between medication self-management and stroke risk factor control, as well as its effect on the quality of life among the stroke patients. The study achieves an endpoint if stroke recurs.

2.2. Study population

The study will identify informed and written consented patients from an ongoing audit of all patients admitted to or seen in outpatient Neurology clinic at (HKL). HKL is the main tertiary hospital in Malaysia that receives a high number of stroke patients and referred stroke patients from various areas from Klang Valley and throughout Malaysia; approximately 1000 to 1200 acute and recurrent stroke cases annually. The targeted patients are adults (age > 18 years) of adequate literacy, diagnosed with the first stroke past 6 months, no stroke before the index event and on stroke risk preventative medications. Those patients with a diagnosis of depression, cognitive impairment or with a stroke caused by accident will not be eligible for study participation. Furthermore, only those who can read, write, and speak English or Malay language are eligible to participate in this study.

2.3. Sample size

A power analysis was carried out for an independent *t* test using the G*Power version 3 to determine a sufficient sample size using an alpha of 0.05 and a power of 0.80.[40] The estimation involved a medium effect size ($w = 0.4$) based on an average of effect sizes from similar recent studies associated to patient education in stroke, IMB, HBM, video narrative, and self-efficacy.[25,41–43] However, sample size calculation according to stratification of stroke risk factors is not feasible because this is a disease with various underlying comorbidities and treatment heterogeneity. Thus, the desired sample size is 200 (100 each in intervention and control groups) are needed. With an estimated 15% attrition rate, 115 in each group will be recruited, thus yielding a target total sample size of 230.

2.4. Randomization

Randomization will be performed by using blocks of varying lengths, between 2, 4, and 6 in opaque envelopes to avoid bias. The order of the blocks and the allocations within each block will also be randomized. Assigning of patients to one of two study arms will take place after the baseline screening.

- The standard care (control group); based on MTAC framework will receive an appropriate referral for rehabilitation, nutrition counseling, and speech therapy from the neurology department. Aside from treatment review and advice, the department also provides short message service (SMS) reminders of next appointments. Pamphlets regarding common patient education information about stroke, and its preventative treatment, as well as a self-monitoring calendar, will be distributed. The information developed according to HBM constructs and MTAC guidelines is about stroke symptoms, preventative treatment adherence advice, and medication management. The patients will be provided with a general helpline in case of any inquiry pertaining to their treatment.
- The intervention group, that will receive standard care procedures, printed materials, reminders, and helpline similar to those in the control group, will also obtain a short face-to-face video narrative of a doctor and a patient's reflection about stroke.

2.5. The intervention

The video narrative and the video scripts have been developed from in-depth patient interviews, MTAC guidelines, HBM constructs, and stroke management guidelines. They have been designed to provide represented connected events and messages so as to motivate and to induce self-efficacy skills suited for the local context.[15,29,44–46] An expert panel that consists of representatives from doctors, pharmacists, educationists, and stroke patients have employed a consensus on the video narrative and video scripts. Flesch-Kincaid reading level for the scripts, quotes, subtitles, and texts is an average grade level of six (6).[47] In order to add value and to increase the impact of role model, a neurologist and a stroke patient were assigned to narrate the scripts so as to portray their true emotion and seriousness of stroke preventative measures. In addition, cues were highlighted in the video narrative as short quotes, while the subtitles were incorporated to increase comprehension of their messages.

3. Data collection, management, and analysis

3.1. Study procedures

With the supervision of a research neurologist, patient screening and randomization will be carried out by a clinic staff nurse who is not involved in this research. Patients will then complete their baseline assessments at the outpatient Neurology clinic. The neurologists will be blinded after the assignment. They will be advised to not to prompt patients regarding reception of intervention. One of the researcher (JRA) who is a pharmacist and a clinical educator, will conduct the baseline assessment. Patients randomized into the intervention arm will be displayed the video immediately after their clinic visit. All patients, regardless of study arm, will receive appropriate standard stroke treatment and medication management. At each consequent visit, the researcher will assess the level of medication understanding and use self-efficacy, while evaluation of stroke risk blood parameters will be done by the staff nurse at the clinic. The researcher will send reminder calls 3 days in advance to promote retention. At each clinic visit, both groups will receive MTAC standard care reminders to encourage self-monitoring, to modify lifestyle, to follow-up clinic appointments, and to enquire

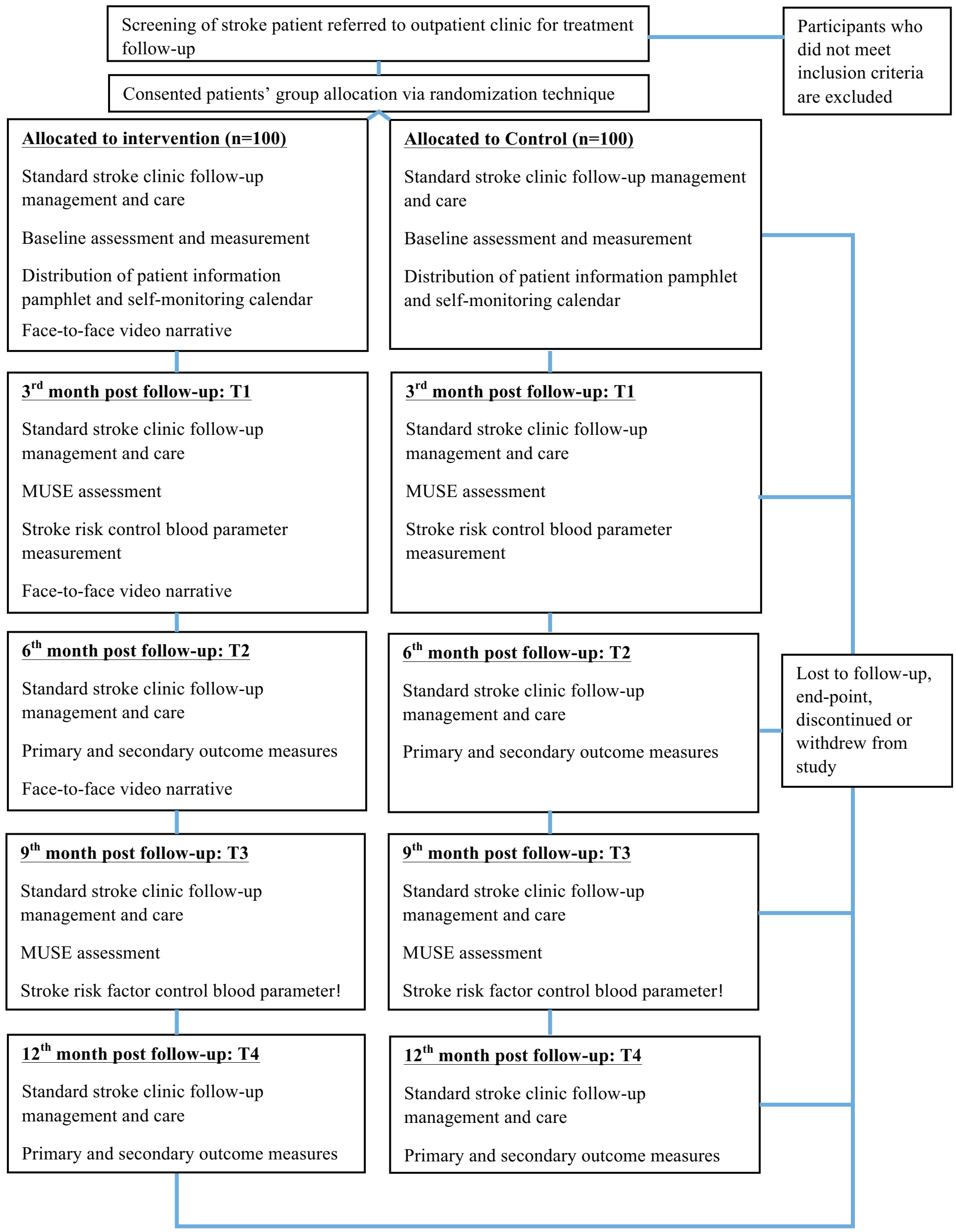

Figure 1. The study flow chart.

regarding their medications. Patients who miss their visits, move too far away, are referred to other outpatient clinics, and those who fail to respond up to 4 times of reminders will be noted as lost to follow-up and eventually withdrawn from the study. Also, if there is a need of unblinding due to the intervention's effect, the patient's allocation will be revealed to their neurologist and that patient is withdrawn from the study. These effects will be recorded and reported in the data analysis.

At each session, the patients will meet the neurologist first for their follow-up treatment review, and next, have further check on self-monitoring practice and lifestyle changes. The clinic staff nurse will assess their blood pressure and other appropriate blood parameters. After that, the clinic staff nurse will guide the patients into a quiet room, where the researcher will meet them individually for the outcome assessment or video viewing. The patients will view the video at baseline: T0, 3rd month: T1 and 6th month: T2 immediately after outcome measure assessment (Fig. 1).

4. Outcomes

4.1. Primary outcome measure

The primary outcome measure assessed at T0, T1, T2, T3, and T4 refers to medication understanding and use self-efficacy (MUSE).[48] The study will observe the stage of medication usage behavior changes for each stroke preventative medication. MUSE with a scoring scale from 0 until 32 will be used to efficiently measure confidence in the understanding of individual's perceived ability using and adhering to the prescribed medicines, which differs from other medication-specific self-efficacy measures. Both the scales; learning and taking medication, have good internal consistency (Cronbach's alpha of

0.77 and 0.68) with acceptable construct validity and predictive validity. This scale has also been validated in the Malay language version.[49]

Knowledge and belief of the disease, as well as its preventative medication, have been associated with medication understanding and use self-efficacy. Therefore, the primary measures assessed at T0, T2, and T4 will also consist of validated Stroke knowledge test (SKT)[50–52] and Brief illness perception questionnaire (BIPQ),[53–55] whereby both have acceptable validity and reliability properties and available in the Malay language version. On top of that, this study will only adapt the BMQ specific Likert scale of the belief about medicine questionnaire[56] so as to hinder redundancy and patient loading. This scale will be translated and validated in Malay language in a separate study. The SKT contains 20 questions with a scoring range of 0 to 20 regarding general information on stroke, such as pathophysiology, signs and symptoms, risk factors, and treatment methods and BIPQ, on the other hand uses a 0 to 10 scoring range of Likert-type scales for the general perception of one's illness. SKT measures differences in knowledge retention between groups whereby higher scores indicate better knowledge retention. BIPQ high scores reflect vulnerable thoughts of threatened attitudes about their disease, which will correlate to the impact of the intervention. Meanwhile, the BMQ specific is comprised of 2 scales; belief about the need of preventative medication (Necessity scale), and concerns about the potential adverse effect of the medication (Concerns scale). Higher scores indicate stronger beliefs about medicine usage.

4.2. Secondary outcome measures

Secondary main outcome measures include patient's stroke risk factor control which could be either on smoking habit, blood pressure, blood glucose, cholesterol, triglycerides, or international normalized ratio (INR) assessed at T0, T1, T2, T3, and T4. This outcome translates adherence to treatment and lifestyle behavioral changes such as diet and stress control, whereas assessment at T2 and T4 includes health-related quality of life, clinic appointment attendance report, and self-monitoring report.

Based on past findings, most of stroke patients were diagnosed with hypertension as their primary stroke risk factor.[36,37] It is defined that blood pressure (BP) control as at or below 140/90 mmHg for patients with no diabetes and at or below 130/80 mmHg for patients with diabetes.[45,46] Therefore, differences of BP will be measured at every session by using calibrated blood pressure device at the neurology clinic. Whereas, the gathered blood samples, are sent and assessed at the hospital laboratory department. The risk of recurrent stroke would be at double-fold if the patient is diagnosed with both hypertension and diabetes. Diabetes control is defined as at A1c level $<6\%$, venous fasting plasma level <7.0 mmol/L, and random plasma level <10 mmol/L. In addition, the stroke symptoms would worsen for patients with underlying cardiovascular disease (CVD). Hence, those with hyperlipidemia control is defined as LDL-C <3.4 to 4.2 mmol/L and triglycerides <8.3 mmol/L.[45,57,58] Furthermore, INR control for stroke patients with atrial fibrillation is 2.0 to 3.0.[59]

The overall secondary outcome measures reflect the perceived benefit to quality of life. This study will use the Short Form (36) Health Survey (SF-36) questionnaire as its quality of life outcome measure.[60] The SF-36, which consist of a 36-item questionnaire, is best used in general clinical practice. The construct domains contain one's perceived physical and mental limitation, such as physical functioning, mental health, emotional problems, social life purpose, general health perceptions, and body pain. The sum of scores is between 0 (worst-perceived health state) and 100 (best-perceived health state). The measure will be able to evaluate the degree of perceived difficulty experienced between both control and intervention groups. This questionnaire has been validated in various languages with acceptable psychometric properties in many clinical settings. Besides, permission has been granted for this study to use the outcome measures from all the respective authors.

4.3. Statistical analysis

Data entry will be done independently by a clinic staff nurse and verified by another. Hardcopies of data collection forms and outcome measures will be kept in a locked safe, whereas softcopies are to be deposited at the repository center (Lab Archives), both at Monash University in Malaysia. Only the principal investigators (JRA), (QKF), and (TKK) have access to the interim results and makes the final decision to terminate the trial. The study team ensures that patients' identity and personal information are coded to maintain confidentiality. In addition, (JRA) and the biostatistician (QKF), who will also be blinded, will conduct the statistical analysis by using International Business Machines Statistical Package for the Social Sciences (IBM SPSS; IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY) (v.22). The initial analysis will consist of descriptive statistics on demographic data, such as frequency distributions. Meanwhile the mean differences in primary and secondary outcomes are compared by using *t* tests or equivalent statistical method, whereas categorical outcomes are matched using chi square test. *P* values $<.05$ are considered statistically significant. Generalized mixed model analysis is adapted to investigate the variances between groups over time for all outcomes evaluated at the allocated time. Furthermore, the association between medication understanding and use self-efficacy, stroke knowledge, illness perception scores, as well as engagement in self-monitoring and clinic appointment attendance will be tested, as they seem to be critical indicators of behavioral changes. Multivariable analysis will be employed to examine the influence of the video narratives on stroke risk factor control and their covariates.[61] Multiple imputation will be adapted to handle missing data if it occurs. In addition, withdrawn patients' feedback about the intervention will be analyzed.

5. Discussion and conclusion

Persistent uncontrolled stroke risk factors can lead to unpredicted recurrent stroke event, thus making effective stroke preventive management a critical public health issue. The stroke care unit in Malaysia has limited patient education resources, especially for patients with medication understanding and use self-efficacy issues. The challenge is even higher for stroke patients who are affected by physical disability, thus hindering both motivation and self-independence. Various individuals' illness beliefs and perceptions complicate one's thoughts towards definite health improvement and meaningful life. In such situation, the success of patient education strategies is at doubt. Patient education via video narratives has been found to be useful in primary care settings and other chronic disease clinic settings,[32,33] but researches are in scarcity for effectiveness of video narrative at stroke care centers as part of the MTAC process.

As such, this study will determine if using doctor and patient video narrative could induce a positive behavioral change towards stroke risk control, whereby the initial observation should enhance medication understanding and use self-efficacy. Besides, the researcher believe that combining a doctor's perception of his stroke patients' attitudes with a stroke patient's experiences about his or her stroke would deliver a mixed emotion of confidence and motivation towards self-efficacy. This idea, which is conceived from combined video narrative, refers to the effort to convey similar messages to stroke patients of varying learning styles and behavioral activation. This intervention is innovative as it combines health belief, motivation, and role model concept to trigger self-efficacy and self-responsibility to modify perceived negative lifestyle imbalances. Hence, it is foreseen that the discoveries from this translational research could serve as resources to further patient education development in stroke care settings. The researchers propose to share the findings to healthcare professionals and to the public via publication and conference proceedings.

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Author contributions

All authors have made a substantial, direct, and intellectual contribution to the work. JRA, TKK, QKF, and AZZ conceived the original concept of the study. JPJ and SSR have assisted in the study protocol development. All authors have contributed to the final design of the study protocol and have approved the final manuscript.

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4.3 Summary

This RCT protocol is a pioneer in the field of post-stroke patient education in Malaysia. The intervention was planned to be carried out during the Neurology outpatient clinic operating hours. Regardless of the busy clinic hours, the patient screening, recruitment, randomization, and video viewing were planned well with minimal load in the clinic workflow. The informed and consented patients from both intervention and control groups received uncompromised treatments from the neurologist at their outpatient clinics. To reduce the effect of confounding factors, the researcher ensured that all participating patients received similar informational brochures, a teach-back session, and reminders. The appropriate outcome measures were all validated in both English and Malay languages. Whereas, the data collection and analysis portrayed sound procedures and applied statistical analysis. Nonetheless, concerning cost, time, and study applicability in an actual setting, we opted to explore the intervention's feasibility and acceptability on a smaller scale within a shorter period before carrying out the 12 months RCT. The following chapters 5 and 6 reports its findings.

CHAPTER 5:Exploring the feasibility and acceptability of the intervention

5.1 Preamble

This feasibility and acceptability study aimed to explore and understand all criteria of the full-scale RCT comprehensively. It was crucial to investigate if the established study protocol could be conducted efficiently and successfully in an actual healthcare setting. This process was vital for the researcher to become aware of any prospective complications or issues during the trial's implementation. Apart from that, it was also essential to explore if post-stroke patients readily accepted the developed video narratives. The study's findings would confirm the intervention's usability and projected effectiveness. The study would be viable if no modifications or only minor adjustments were required to progress to the full RCT. The results of this study are presented in this paper.

Original Paper

Video Narratives Intervention Among Stroke Survivors: Feasibility and Acceptability Study of a Randomized Controlled Trial

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Abstract

Background: A large number of stroke survivors worldwide suffer from moderate to severe disability. In Malaysia, long-term uncontrolled stroke risk factors lead to unforeseen rates of recurrent stroke and a growing incidence of stroke occurrence across ages, predominantly among the elderly population. This situation has motivated research efforts focused on tapping into patient education, especially related to patient self-efficacy of understanding and taking medication appropriately. Video narratives integrated with health belief model constructs have demonstrated potential impacts as an aide to patient education efforts.

Objective: The aim of this study was to investigate the feasibility and acceptability of study procedures based on a randomized controlled trial protocol of a video narratives intervention among poststroke patients. We also aimed to obtain preliminary findings of video narratives related to medication understanding and use self-efficacy (MUSE) and blood pressure control.

Methods: A parallel group randomized controlled trial including a control group (without video viewing) and an intervention group (with video viewing) was conducted by researchers at a neurology outpatient clinic on poststroke patients (N=54). Baseline data included patients' sociodemographic characteristics, medical information, and all outcome measures. Measurements of MUSE and blood pressure following the trial were taken during a 3-month follow-up period. Feasibility of the trial was assessed based on recruitment and study completion rates along with patients' feedback on the burden of the study procedures and outcome measures. Acceptability of the trial was analyzed qualitatively. Statistical analysis was applied to ascertain the preliminary results of video narratives.

Results: The recruitment rate was 60 out of 117 patients (51.3%). Nevertheless, the dropout rate of 10% was within the acceptable range. Patients were aged between 21 and 74 years. Nearly 50 of the patients (>85%) had adequate health literacy and exposure to stroke education. Most of the patients (>80%) were diagnosed with ischemic stroke, whereby the majority had primary hypertension. The technicalities of randomization and patient approach were carried out with minimal challenge and adequate patient satisfaction. The video contents received good responses with respect to comprehension and simplicity. Moreover, an in-depth phone interview with 8 patients indicated that the video narratives were considered to be useful and inspiring. These findings paralleled the preliminary findings of significant improvement within groups in MUSE (P=.001) and systolic blood pressure control (P=.04).

Conclusions: The queries and feedback from each phase in this study have been acknowledged and will be taken forward in the full trial.

Trial Registration: Australian New Zealand Clinical Trials Registry ACTRN 12618000174280; https://www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=373554

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KEYWORDS

feasibility and acceptability; medication understanding; use self-efficacy; stroke; video narratives

Introduction

Background

Establishing a patient narrative is a common method for analyzing how individuals with illnesses express themselves to best recognize and reflect the values and teachings that are most important to them and how they react toward their actions [1]. Personal and interpersonal factors such as coping strength and family or social support form the basis of these narratives [2]. Thus, a narrative can influence changes in health behaviors toward achieving appropriate health outcomes [3,4]. Narratives incorporated in multimedia format can effectively deliver patients' stories to viewers who can then become "carried away" by their peers' experiences and help them to learn from others [5]. A high percentage of the delivered information in patient education offers engagement via the visual and hearing senses. Therefore, the use of video narratives offers a great chance of proper comprehension and reflection among patients [6].

Video narratives have long been explored and developed for various patient education purposes in chronic disease management [7-9]. However, there are limited studies on video narrative-based interventions in poststroke patients, and their outcome measures varied in terms of the severity of the disease and psychosocial challenges [10,11]. In Malaysia, the ischemic stroke incidence has shown an increase of approximately 30% annually, with an increase of approximately 19% for hemorrhagic stroke, which is a more prominent condition among the aging community [12,13]. The majority of poststroke patients experience physical disability, learning, and speech impairment, which also lead to emotional problems [14,15]. Hence, an individual who experienced stroke will benefit from resilience, which requires self-efficacy [16,17]. Medication nonadherence had been associated with a lack of self-efficacy in poststroke patients, especially with regard to understanding and taking medication [18]. Thus, patient education efforts that focus on enhancing medication understanding and use self-efficacy (MUSE) are warranted. Indeed, sustaining medication adherence is crucial to achieve optimal recurrent stroke treatment effects [19]. Despite the advancement of stroke prevention treatment, medication nonadherence prevalence remains notable among patients with high stroke risk factors such as hypertension and cardiac disease [20,21]. Social learning theory explains that a person's behavior depends on adaptation of their thoughts and beliefs, which are influenced by the environment and in turn control the individual's actions [22]. This theory proposes that medication adherence relates to an individual's perception of health issues, which influences self-efficacy toward prescribed medication [23,24].

There are limited studies aimed at understanding the use of video narratives with the integration of health belief constructs and motivational cues. In addition, little is known about the effect of video narratives on poststroke patients in particular. Stroke survivors require motivational support, which could help them to enhance their effort in understanding prescribed medication and taking it appropriately [25]. We believe that video narratives offer an opportunity to facilitate the existing stroke patient education effort of the medication therapeutic adherence clinic (MTAC) [26]. Moreover, the outpatient clinic waiting time and area offer a potential period and venue for patients to receive these inputs [27]. Thus, we aimed to evaluate the feasibility and acceptability of a video narratives randomized controlled trial (RCT) among poststroke patients in Malaysia.

Objectives

This study was an a priori phase of a powered RCT [28] focused on determining the recruitment, retention, and completion rate of the trial. Patients' qualitative feedback and views were collected with respect to the acceptability of the videos. We also analyzed the preliminary changes of MUSE over the course of the intervention and compared the findings with a control group.

Methods

Ethical Considerations

The study received ethics approval from the Malaysian Medical Research and Ethics Committee, Ministry of Health Malaysia (NMRR ID-15-851-24737) and the Monash University Human Research Ethics Committee (ID 9640).

Sample Size, Eligibility, and Randomization

Given the lack of similar studies, there was no referral for appropriate effect sizes. Moreover, a feasibility study without inferential results does not necessarily require a power analysis [29]. Therefore, we estimated the sample size based on practical considerations and experience of the researchers [30,31]. This pretest and posttest design, two-arm RCT was conducted from March 2018 to June 2018 among informed and consenting stroke survivors who had clinic appointments at the Neurology Outpatient Department of Hospital Kuala Lumpur (HKL), Malaysia. We aimed to recruit a minimum of 25 patients per group. Eligible and consenting patients were adults diagnosed with their first stroke within 6 months of the recruitment period, and were prescribed stroke risk preventative medications from HKL. Those excluded were diagnosed with depression (Patient Health Questionnaire score≥1) and cognitive impairment (Montreal Cognitive Assessment score<26). We only included patients who could comprehend the English or Malay language.

Randomization was performed via the block method between 2, 4, and 6 lengths placed in opaque envelopes. The allocations of each block were also randomized. Patients were either allocated to the standard care (control) or intervention (with video viewing) group. The full description of the study's methodology is available in our protocol trial report [28].

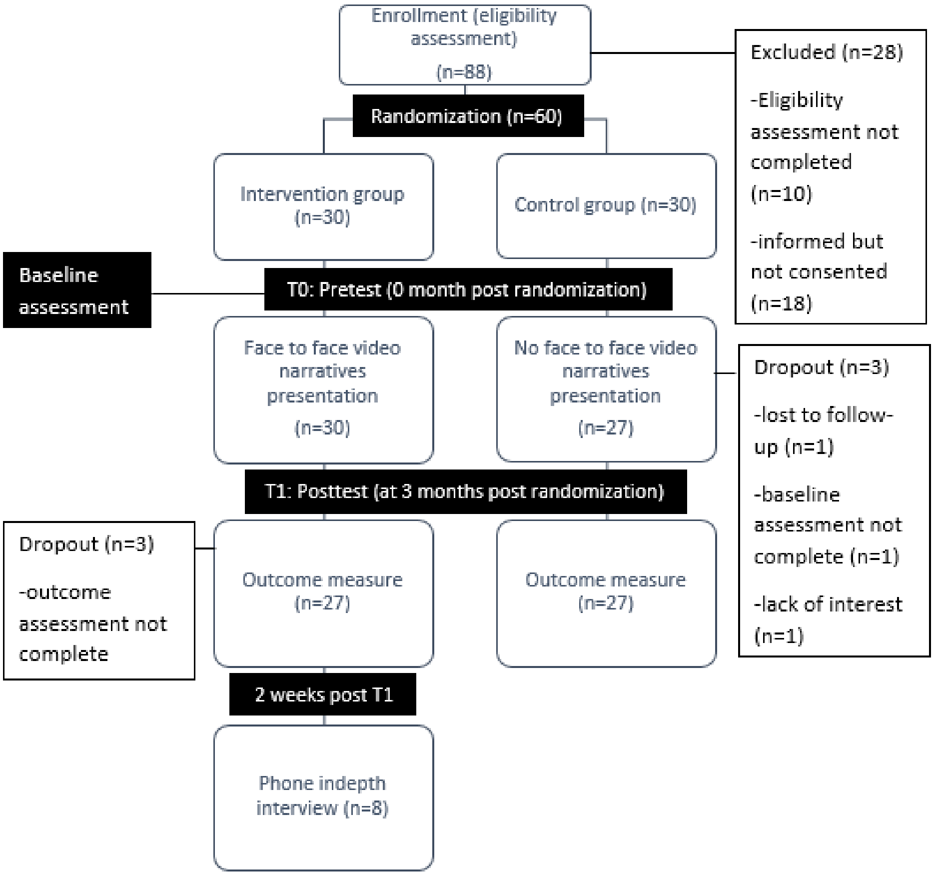
Video Narratives

Based on research interest and considering the motivational need of poststroke patients, we developed a set of video narratives incorporated with health belief model constructs. The validation procedures and narrative contents in the English and Malay languages have been described in detail in our previous paper [32]. The video narratives provided messages (culturally appropriate for the local context), which served as triggers to motivate patients to be resilient in attaining self-efficacy skills as per their perceived needs. To reflect the purpose of role models, a neurologist and a stroke survivor volunteered to narrate their story in a video to render their honest emotion while stressing the need to adhere to stroke preventative medication (see Multimedia Appendix 1 and Multimedia Appendix 2). Short quotes and subtitles were incorporated to increase attentiveness toward the comprehension of their messages [33].

Intervention Design and Study Procedures

The groups in this RCT received treatment with ongoing patient education and counseling as per HKL neurologists' recommendations. The treatment compliance practice included MTAC appointments, self-monitoring checks, and outpatient clinic attendance. Both groups received pamphlets on stroke awareness and its preventative medication information, and the "teach-back method" was used to help reduce discrepancies between the two groups [34,35]. The "teach-back" queries were related to medication dose, frequency, indication, and time as recommended by the MTAC. In addition to this standard care, only the intervention group received face-to-face video narratives. Figure 1 illustrates the CONsolidated Standards Of Reporting Trials (CONSORT) flowchart showing patients' participation throughout the study at data collection time points. We collected the quantitative data at baseline (T0) and 3 months postrandomization (T1), and collected qualitative data via a semistructured interview upon completion of the study. Similar data collection and follow-up procedures as applied in the main study protocol were followed [28]. Blinding was impossible for the patients. This also includes the researchers who conducted the assessment of the questionnaire, except for the treating neurologists.

Figure 1. CONsolidated Standards Of Reporting Trials (CONSORT) flowchart of poststroke patients throughout the study.



Outcome Measures

Main Outcome Measure

The main outcome measure assessed at pretest (T0) and posttest (T1) referred to MUSE. The MUSE is assessed on an 8-item Likert-type scale with total scores ranging from 0 to 32, which measures the perceived self-efficacy in understanding and taking prescribed medication. It has good internal consistency (Cronbach α >.70) with adequate construct and predictive validity [36]. We repeated MUSE for each prescribed stroke preventative medication.

Understanding and taking medication is also associated with other factors such as knowledge, perception, or belief [37]. Therefore, we aimed to observe changes in these factors as well. Hence, the feasibility study assessed the baseline of the following secondary outcome measures.

Stroke Knowledge Test

The stroke knowledge test of 20 items is a measure of stroke knowledge, which is vital in evaluating the quality of stroke education modules. The stroke knowledge test has received acceptable and favorable ratings from health and educational experts, which reflected its excellent reliability and construct validity [38].

Brief Illness Perception Questionnaire

The brief illness perception questionnaire (BIPQ) is assessed on a 9-item Likert scale with a 0 to 10 scoring range that intends to evaluate the perceptive and emotive illustrations of the effect of an illness on a patient. This measure demonstrated good test-retest reliability and high concurrent and discriminant validity [39].

Belief About Medicine Questionnaire

Belief About Medicine Questionnaire (BMQ) is an 18-item questionnaire with two constructs: BMQ-General and BMQ-Specific. Both constructs are further divided into the subscales of overuse harm and necessity concerns. The scales of both constructs have acceptable internal consistency, discriminant validity, and reliability [40]. This measure assesses general and specific medication beliefs and perceptions. Nevertheless, only the BMQ-Specific construct measure was repeated for each prescribed stroke preventative medication in this study.

Short Form (36) Health Survey

Short Form (36) Health Survey (SF-36) comprises a 36-item questionnaire with scoring between 0 and 100. The SF-36 is able to measure perceived physical and mental constraints. It has been translated, validated with acceptable psychometric properties, and used widely in various clinical settings to measure the overall health state [41].

Other Measures

Other measures included systolic and diastolic blood pressure, fasting blood glucose, total cholesterol, and international normalized ratio.

We received the “permission to use” from the authors of the original (English) and the translated (Malay language) versions of the questionnaires, deemed to be locally appropriate for this study [42-45]. The researchers also conducted a face and content validity analysis with 5 patients and experts prior to this study to confirm the understandability and the content validity index>0.80 of MUSE, BMQ-specific, and BIPQ for the named medication(s), for which the word “illness” was replaced with “stroke” in the measures.

Data Collection Procedures

We obtained the patients’ sociodemographic and health information using a data collection form that recorded gender, age, ethnicity, educational attainment, and health literacy status using the Newest Vital Sign format [46]. Concurrently, we retrieved clinical health data on the type of stroke and stroke risk factors from the hospital’s patient medical records. All consenting patients from the intervention group had the option to volunteer to participate in a 10-minute phone or face-to-face interview within 2 weeks of follow up from the data collection point (T1). This was conducted to obtain feedback on the burden of outcome measures (questionnaires) and the acceptability of viewing the video as an intervention. The researchers maintained data confidentiality and patients’ safety as per the protocol [28].

Data Analysis

Quantitative Data

Statistical analyses were performed using IBM SPSS Statistics V.24.0 with $P<.05$ as the threshold significance level. Descriptive statistics (eg, means and percentages) were used to describe the characteristics of both the control and intervention groups, along with the study and intervention’s feasibility and acceptability. Chi square tests were applied to explore dissimilarities in patient characteristics between both groups at baseline. Data differences over time between the two time points (T0 and T1), at intergroup and intragroup levels, were also analyzed for the outcome measures using the Mann-Whitney *U* test and the Wilcoxon rank-sum test. The results for outcome measures and mean differences were calculated as means (SD), range, or 95% CI as appropriate. Multiple imputation was applied for missing data.

Qualitative Data

The phone interview recordings were transcribed and translated verbatim. Two researchers reviewed the transcripts, wherein they occasionally met to discuss the developed themes. The themes were then verified by another researcher to assure uniformity and quality. The transcripts and written feedback were analyzed using thematic analysis [47]. We applied the software NVivo 11 (qualitative data analysis software; QSR International Pty Ltd, Version 11, 2015) to identify the themes and to help in organizing the codes.

Results

Participant Characteristics

Table 1 presents the sociodemographic and health information of patients who participated in and completed the trial over the full study period. Both groups comprised more men than women with a dominance of more than 50%, and most patients were predominantly of Malay ethnicity in both groups (>80%). Patients were between 21 and 74 years old, with a mean age of 56 years (SD 13.1) for the control group and 53 years (SD 11.6) for the intervention group. Nearly 50 participants (>85%) had secondary education, which included tertiary attainment, with adequate health literacy and exposure to stroke education. More than half of the patients were unemployed. The majority of patients (>80%) had experienced ischemic stroke and had several underlying stroke risk factors inclusive of hypertension, but not all controllable risk factors were documented, such as diet, obesity, and physical inactivity, due to lack of data in medical records. Among them, approximately 25 patients (50%)

had diabetes, and more than 50 patients (about 90%) were taking at least three types of stroke preventative medication. There were no significant differences in sociodemographic characteristics and measures between the two groups, except for gender.

The following sections are presented as per study objectives and with subdivisions to the feasibility and acceptability of (1) the RCT procedures, (2) video narratives intervention, and (3) preliminary findings of the effect of the video narratives on MUSE and blood pressure as a stroke risk factor control.

Table 1. Sociodemographic and health data of patients at 3-month follow up (N=54).

Characteristic	Control (n=27)	Intervention (n=27)
Gender, n (%)		
Male	18 (67)	15 (56)
Female	9 (33)	12 (44)
Age (years), n (%)		
≥60	10 (37)	8 (30)
40-59	13 (48)	16 (59)
≤39	4 (15)	3 (11)
Age (years), mean (SD)	56 (13.1)	53 (11.6)
Ethnicity, n (%)		
Malay	22 (82)	23 (85)
Chinese	1 (4)	1 (4)
Indian	4 (15)	3 (11)
Education attainment, n (%)		
Primary	4 (15)	2 (7)
Secondary	15 (56)	18 (67)
Tertiary	8 (30)	7 (26)
Health literacy level, n (%)		
Adequate	23 (85)	24 (89)
Limited	4 (15)	3 (11)
Employment status, n (%)		
Employed	11 (41)	7 (26)
Unemployed	16 (59)	20 (74)
Type of stroke[a], n(%)		
Ischemic	22 (82)	25 (93)
Hemorrhagic	0 (0)	0 (0)
TIA[b]	5 (18)	2 (7)
Stroke risk factors (comorbidities), n (%)		
Hypertension and other risks[c]	24 (89)	26 (96)
Diabetes only	2 (7)	1 (4)
Other risks only	1 (4)	0 (0)
Varieties of prescribed medication, n (%)		
≤2 types	2 (7)	3 (11)
≥3 types	25 (93)	24 (89)
Received formal or informal information about stroke prevention, n (%)		
Yes	23 (85)	24 (89)
No	4 (15)	3 (11)

[a]Inclusive of modifiable stroke risk factors other than hypertension (eg, diabetes, heart diseases, hyperlipidemia, current smoking/alcohol).
[b]TIA: transient ischemic attack.
[c]Other risks include nonspecific International Classification of Diseases stroke codes.

Feasibility and Acceptability of the RCT Procedures

The randomizing method, administration, and questionnaire retrieval at the outpatient waiting zone were effectively carried out. We experienced minimal challenges and uninterrupted flow at ushering patients individually to an allocated quiet room for video viewing. We received written feedback from 12 patients. Overall, the patients were satisfied with the study procedures, including the usage of a 5.3-inch-wide screen tablet and headphones, but commented on the burden of the self-administered questionnaires (for assessing the outcome measures). A few remarks were related to the exhaustive repetition of the MUSE and BMQ for each type of medication and the extensive length of the SF-36. Furthermore, there were suggestions to receive a token of appreciation for sustaining their participation.

Recruitment Rate

A total of 117 poststroke patients were screened from clinical records within 1 month for recruitment of trial participation, but only 88 patients were eligible according to the inclusion and exclusion criteria, resulting in an eligibility rate of 75.2%. Among all 88 patients, 70 patients provided consent to participate, but only 60 of them completed the baseline assessment. Hence, the recruitment rate was 51.3%. The most common reasons that patients declined enrollment were a language barrier, afraid of increased stress, and refusal.

Dropout and Study Completion Rates

During the baseline assessment (T0) and the 3-month follow-up assessment (T1), the number of patients completing the study dropped to 54 from 60 (90%), which reflected a dropout rate of 10%. The most common reason for not completing the study was an inability to be contacted, which we considered to indicate refusal for further participation.

Feasibility and Acceptability of the Video Narratives Intervention

We sought to gain in-depth information on technical issues and views on the video narratives' usefulness as a motivational trigger to improve MUSE. The results of several subthemes identified are presented in Textbox 1.

Textbox 1. Themes and quotes associated with the feasibility and acceptability of the video narratives intervention.

Feasibility of the video narratives

Main theme: Engagement and comprehension

- Messages were short, transparent, and easily understood

  You must not make the video too long. Like this one, that is just nice…not boring….What you see on video, the doctor was very good [P2]

- Patients had the option to view it in their preferred language; either in English or in Malay

  Things related to stroke should be explained by patients themselves… not just knowledge but experience… so that others will be aware [P6]

- The narratives were suitable for the elderly

  Most elderly patients are very stubborn about taking medicine. Show the video especially to the elderly patients [P7]

- Appropriate video viewing frequency

  Watching the video once in a while like this is good…. [P3]

Main theme: Generalizability

- There were suggestions to share the video among friends via other media platforms such as WhatsApp or to continuously play it on air in the hospital.

  I can share this video with my friends in WhatsApp [P1]

  I want to send the video for my friends to watch! [P5]

  Maybe what they can do probably is over some TV set… what do you call that…program? Put the show, I mean like this type of video, what'll happen when you have a stroke and all that… So that patients can listen instead of giving TV1 all the time you know? [P2]

Acceptability of video narratives

Main theme: Informative and reminder

- The videos narratives were a "trigger" toward proactivity and enhanced patients' awareness about stroke and its preventative treatment.

  They remind us of important medicine… They remind us of the danger of the second stroke… to take medicine well and to have a healthy lifestyle [P7]

  Helpful….more understanding about stroke [P6]

  Awareness… before that we were not really concerned about our health. Now, after the advice it's different... like a guide [P4]

  Patients can recover from stroke and (it) won't recur if we take the medicine prescribed by doctors according to the right schedule on time [P2]

Main theme: Emotional consolation

- Viewing the video narratives provided some hope and less fear to overcome stroke challenges.

  It's a bit of both worrying and confidence… There is always a worry about what can happen, but it also gives you an idea (on) what to do, and what to be careful, and what to be aware [P3]

- The video was an aid to their plight that there was life after stroke.

  Because you are a stroke patient, you have to look at the guidelines… you want to know (more)… you have to take care of yourself, right? You'll be confident when you have such thing (to guide you) … Before this… you don't know anything… fear about getting another attack… right? [P1]

  Others must know that people who got stroke, just like us, but they can recover. Sometimes, for stroke, people can't really help, except for the patients themselves [P4]

Main theme: Perception and confidence

- The motivational cues inspired the patients and raised confidence among themselves.

  … (sharing) someone's experience to change others' mind. Sometimes, we need to listen to their stories for us to make a change [P4]

-

They had a positive outlook towards stroke recovery and were willing to do better to improve their health condition.

I feel that I have to follow the advice, for example, taking medicine, doing blood test… that have been mentioned… (The videos) seem to inspire us to take care of health so that we won't get sick. Perhaps to give encouragement makes me feel that I can recover from stroke if follow all the advice [P5]

Usually, if you never had a stroke before, you don't really care about watching the videos. Once you had (a stroke), you'll realize that… health is important… you have to take care of it… watch their story… that's it! [P1]

Now I ask my doctor more questions if I don't understand…. [P2]

Preliminary Findings

Table 2 presents the results as per the trial protocol of outcome measures at T1 for MUSE and blood pressure control. There were no significant differences in outcome measures at baseline (T0) between the two groups (*P*<.001). All patients were on antiplatelet therapy, and the majority of patients diagnosed with hypertension were on antihypertensive medication (control group, n=24; intervention group, n=26). Therefore, only the general MUSE and specific MUSE for antithrombotic and antihypertensive medications were applied.

Both groups showed improvement in MUSE scores, but the intervention group presented greater differences from baseline compared to the control group. Similar trends were found for blood pressure control, whereby the intervention group had better systolic pressure regulation compared to the control group (Table 3). The MUSE outcomes of the intervention group were significantly different for the between-group and within-group analysis (Table 4).

Table 2. Outcome measurement of both groups at baseline (T0[a]) and posttest (T1[b]) assessments.

Measure	Control group, mean (SD), range		Intervention group, mean (SD), range	
	T0	T1	T0	T1
MUSE[c]				
All medications	27.0 (4.71), 16-32	27.6 (3.76) 20-32	26.3 (5.81), 16-32	30.1 (3.62), 20-32
Hypertensive[d]	36.2 (4.62), 17-32	27.8 (35.7), 22-32	26.3 (5.59), 16-32	30.1 (3.51), 20-32
Antithrombotic[e]	27.0 (4.70), 16-32	24.4 (3.73), 20-32	27.3 (5.43), 16-32	30.0 (3.57), 20-32
Systolic blood pressure[d] (mmHg)	138.7 (7.84), 127-162	137.9 (10.78), 124-60	147.0 (16.8), 121-186	137.8 (12.74), 117-165
Diastolic blood pressure[d] (mmHg)	79.6 (11.62), 54-107	80.0 (10.93), 60-105	85.7 (11.59), 58-109	85.0 (9.07), 68-100

[a]T0: baseline (control group n=27, intervention group n=30).

[b]T1: 3 months postrandomization (control group n=27, intervention group n=27).

[c]MUSE: medication understanding and use self-efficacy.

[d]Prescribed with antihypertensive medication and diagnosed with hypertension as a primary factor (control group n=24, intervention group n=26).

[e]Prescribed antithrombotic medication as a prerequisite preventative treatment for stroke (control group n=27, intervention group n=27).

Table 3. Comparison of outcome measurement within groups.

Measure	Control group			Intervention group		
	T1[a] – T0[b] (95%CI)	*Z* value	*P* value[c]	T1 – T0	*Z* value	*P* value[c]
MUSE[d]						
All medications	0.52 (–1.61-2.65)	–0.85	.39	4.57 (1.94-7.19)	–3.63	.001
Hypertensive[e]	1.26 (–0.36-2.89)	1.79	.07	4.35 (2.18-6.52)	–3.60	<.001
Antithrombotic[f]	–0.91 (–1.29-3.11)	–0.37	.71	3.70 (1.62-5.77)	–3.18	.001
Systolic blood pressure[e] (mmHg)	–1.87 (–6.70 to –2.96)	0.54	.59	–13.04 (–22.22 to –3.87)	–2.03	.04
Diastolic blood pressure[e] (mmHg)	0.48 (–6.17-7.13)	–0.59	.56	–0.87 (–6.58-4.84)	–0.144	.89

[a]T1: baseline (control group n=27, intervention group n=30).
[b]T0: baseline (control group n=27, intervention group n=30).
[c]Wilcoxan signed-rank test
[d]MUSE: medication understanding and use self-efficacy.
[e]Prescribed with antihypertensive medication and diagnosed with hypertension as a primary factor (control group n=24, intervention group n=26).
[f]Prescribed antithrombotic as a prerequisite preventative treatment for stroke (control group n=27, intervention group n=27).

Table 4. Comparison of outcome measurement between the control and intervention groups.

Measure	Difference in T1[a] (95%CI)	*Z* value	*P* value[b]
MUSE[c]			
All medications	2.74 (1.29-4.19)	–3.14	.002
Hypertensive[d]	2.35 (0.87-3.81)	–2.65	.008
Antithrombotic[e]	2.78 (1.28-4.29)	–3.14	.002
Systolic blood pressure[d] (mmHg)	0.96 (–6.58-8.49)	–0.17	.86
Diastolic blood pressure[d] (mmHg)	6.04 (0.94-11.14)	–1.84	.07

[a]T1: mean score/measurement differences between intervention and control groups at 3 months postrandomization.
[b]Mann-Whitney U test.
[c]MUSE: medication understanding and use self-efficacy.
[d]Prescribed with antihypertensive medication and diagnosed with hypertension as a primary factor (control group n=24, intervention group n=26).
[e]Prescribed antithrombotic as a prerequisite preventative treatment for stroke (control group n=27, intervention group n=27).

Discussion

Principal Findings

The aim of this study was to assess the feasibility and acceptability of a planned intervention in an actual clinical setting. We successfully tested the intervention processes as per the trial protocol from the initial stage of recruitment, randomization, baseline assessment, and at the first outcome phase.

Feasibility and Acceptability of Study Procedures and Outcome Measures

The recruitment period of 1 month was found to be appropriate as we were able to enroll more than the minimum planned sample size. The recruitment rate of 51.3% was comparable to the average trend of stroke trials conducted from 1990 to 2014, whereby there were no substantial increase or decline rates over the past 25 years [48]. At 3 months, the attrition rate was below the a priori projection of 15%. The positive recruitment rate might reflect concerns and interest to enhance stroke recovery. Nonetheless, we believe that more effort would be needed to sustain the dropout rate expected for the full 12-month trial, as reflected by the desire for monetary compensation indicated by a few patients. Despite this, we found that poststroke patients were able to cope with the study flow, and the extent of participation persuasion was not coercive, which was within the trial ethics jurisdiction and funding capacity [49].

The repeated MUSE on each stroke preventative medication group was necessary to elicit a significant association of self-efficacy with medication categories. However, there were concerns that the questionnaire administering process was time-consuming and created a feeling of redundancy among the patients. As the majority of poststroke patients were primarily hypertensive [50], it was crucial to obtain responses from patients within the three categories in the full trial. Owing to the inability to recruit more samples with other primary diagnosed stroke factors such as diabetes and hyperlipidemia, it remains to be investigated whether an influx of broader inclusion criteria would change the patient sample proportion. Similarly, comments related to the SF-36 received were similar with respect to the burden of its lengthiness. Nonetheless, it was not possible to substitute this questionnaire with other versions [51] due to the constricted contract for the Malay language version. Therefore, with all these issues taken into consideration, the full trial protocol was carried out as planned without significant changes in its outcome measures and study procedures.

Feasibility and Acceptability of Video Narratives

The video contents were comprehensible (layman terms) and had a sensible touch of emotion suitable for the local culture and language with a clear benefit for aging poststroke patients. There was a rising awareness of how audio-visual technology can influence different age groups and social environments. This feedback was comparable to similar trials with positive outcomes [52-54]. Nevertheless, face-to-face video viewing was maintained in this trial to prevent restriction of sample inclusion and exclusion criteria.

It was not surprising that the videos were perceived to be motivational for the poststroke patients. The qualitative results showed positive responses, which increased our anticipation that the videos incorporated with health belief constructs could facilitate standardized ongoing patient educational efforts in a clinical setting. The concise keywords used as cues added with authentic emotions triggered awareness and inspiration among patients toward being more self-efficacious in understanding and taking medication appropriately. Recent studies in different settings and samples have reported similar findings [55,56]. Other than that, educational video narratives could also improve the doctor-patient relationship. Paralleling previous studies, the combination of both personal views of the doctor and patient in this study potentially caused small positive perception changes in MUSE or initiated regular health monitoring [57,58]. Therefore, the preliminary outcomes in the intervention effectiveness analysis corresponded with our justification.

Preliminary Findings

In an associated review, it was clear that the presentation of “real people” has a motivating effect for peers with similar underlying illness [26] (stroke in this case). Hence, the initial impact on MUSE and systolic blood pressure provides insights toward a purposeful trial. The 3-month gap of video viewing to moderate the burden and the dropout rate was also appropriate, as indicated in a previous study [55]. Thus, we concluded that the measurement of self-efficacy among poststroke patients at the per allocated period could be assessed effectively [59]. Furthermore, these results were consistent with studies indicating a significant improvement in MUSE, which paralleled improved stroke risk factors control, such as systolic blood pressure [60,61]. Nevertheless, as we observed variation (coefficient of variation>1) for all variable differences with inconsistent confidence intervals, a bigger sample size would confirm its significance; otherwise, these positive results would have to be interpreted judiciously.

Strengths and Limitations

In designing the study, we spared no effort at not disrupting the workflow of a real-life outpatient clinic environment. However, there were unavoidable circumstances. For example, the blood pressure measurement was to be carried out by the physician or neurologists in their clinic only. We also foresee an issue since individual follow-up of neurology outpatient clinic appointment dates varied from 2 to 5 months and coincided with other clinical appointments (eg, diabetes clinic, heart disease clinic, rehabilitation, physiotherapy, and MTAC). Therefore, it was appropriate to consider documenting blood parameters at T0, T2, and T4 for the intervention effectiveness analysis. Hence, it was a challenge to ensure patients to view the videos within the 3-month gap from baseline. Nevertheless, we overcame these issues with transport reimbursement provided to the patients so as to maintain the retention rate and self-posted questionnaires to avoid further loss of data.

Several other limitations are the exclusion of patients who were unable to comprehend the English and Malay languages, which would have increased bias and limited the generalizability of the preliminary results. In addition, as a cost-effective approach, we were not able to carry out this study for more than 3 months. Despite all these limitations and challenges, the study procedures and outcome measures strategy were considered to be robust to inform the design of a successful 1-year RCT [28]. This study demonstrated versatile and helpful methods in achieving unanimous consensus.

Conclusion

Preliminary studies are crucial in assessing the success of a novel intervention [62]. This innovative method has been applied in various clinical settings in developed countries [52,63]. However, it has not yet been investigated for the poststroke patient population in Malaysia. This study successfully assessed the feasibility and acceptability of the video narrative intervention. The feedback and lessons learned from the baseline until the first follow-up assessment increased the awareness of both foreseen and unforeseen challenges. More importantly, we tested the initial requirement for full RCT accomplishments such as patient recruitment, feasibility, and acceptability of all outcome measures. Future research on the effectiveness of using culturally appropriate video narratives for a more extended period is warranted.

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Conflicts of Interest

None declared.

Multimedia Appendix 1

Screenshot of video narratives of neurologist.
[PNG File , 249 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Screenshot of video narratives of patient.
[PNG File , 215 KB-Multimedia Appendix 2]

Multimedia Appendix 3

CONSORT checklist.
[PDF File (Adobe PDF File), 145 KB-Multimedia Appendix 3]

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Abbreviations

BIPQ: Brief illness perception questionnaire
BMQ: Belief about medicine questionnaire
CONSORT: CONsolidated Standards Of Reporting Trials
HKL: Hospital Kuala Lumpur
MTAC: medication therapy adherence clinic
MUSE: medication understanding and use self-efficacy
RCT: randomized controlled trial
SF-36: Short Form (36) Health Survey
T0: baseline
T1: 3 months postrandomization

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5.3 Summary

This study overlooked the feasibility and acceptability of the planned RCT over three focus areas, which were; the video narratives, study procedures, and outcome measures. Overall, the patients were satisfied with the video narratives' comprehension and emotional aspects, which we believed well suited the prevailing culture and language. Nevertheless, the procedures experienced several challenges in presenting the video face to face within the stipulated gap; therefore, we modified the assessment period to be at T0, T2, and T4 for the full RCT. Furthermore, the outcome measures such as the BMQ and SF36 also received several remarks on the burden to complete issues. Adding on, as part of limitation, a better comparison with a third ‘placebo’ group would have been appropriate to justify the reliability of significant preliminary results.

Nevertheless, the drop-out rate was within the appropriate range, considering the projected rate of less than 20% over a year. Therefore, all feedback was taken into consideration for minor amendments in the study procedures to accomplish the one-year trial. However, these findings also provided opportunities for being prepared with additional measures to sustain patients' retention of both intervention and control groups in an actual clinical setting. With this done, the research phase progressed to the 12-months RCT. The following manuscript reports its findings.

CHAPTER 6:Determining the impact of the intervention

6.1 Preamble

The thesis has described the needs and potential use of video narratives to overcome issues on self-efficacy and medication-taking behavior among recurrent stroke risk patients. This thesis has also identified the association between several behavioral factors and MUSE; moreover, it proposed MUSE as a prospective predictor for stroke treatment adherence in the local healthcare setting. All these findings led to the demonstration of a vigilant strategy. This include process towards the development and validation of personalized video narratives incorporated with behavioral constructs associated with MUSE. Following this, we asserted the projection of positive outcomes via a feasibility and acceptability study trial. After minor procedures adjustments, we performed a full year RCT of the video narratives intervention on post-stroke patients. This chapter presents the impact of the intervention and related outcomes of the trial.

Patient Preference and Adherence

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ORIGINAL RESEARCH

An Evaluation of the Video Narrative Technique on the Self-Efficacy of Medication Understanding and Use Among Post-Stroke Patients: A Randomized-Controlled Trial

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Introduction: Self-efficacy is positively associated with medication understanding and use self-efficacy (MUSE) among post-stroke patients. It is also closely related to knowledge, belief, and perception, which vary among people from different socioeconomic backgrounds and cultures. As interventions using video and peer stories have emerged to be successful on behavior modification, this study aimed to explore the effectiveness of video narratives incorporated with Health Belief constructs on MUSE and its associated factors among patients with stroke at a local setting.

Methods: A randomized controlled trial (RCT) for 12 months was carried out on patients diagnosed with stroke at Hospital Kuala Lumpur, Malaysia. The RCT recruited up to 216 eligible patients who were requested to return for two more follow-ups within six months. Consented patients were randomized to either standard care or intervention with video narratives. The control of potential confounding factors was ensured, as well as unbiased treatment review with prescribed medications, only obtained onsite.

Results and Discussion: A repeated measure of MUSE mean score differences at T0 (baseline), T2 (6th month) and T4 (12th month) for antithrombotic, antihypertensive, and all medication categories indicated significant within and between groups differences in the intervention group ($p<0.05$). Moreover, this impact was reflected upon continuous blood pressure (BP) monitoring compared to the control group (F (1214) =5.23, $p=0.023$, $\eta 2=0.024$). Though BP measure differences were non-significant between the groups ($p=0.552$), repeated measure analysis displayed significant mean differences between intervention and control group on BP control over time (F (1.344, 287.55) =8.54, $P<0.001$, $\eta 2=0.038$). Similarly, the intervention's positive impact was also present with similar trends for knowledge, illness perception, and the belief about medicine. Though significant differences ($p<0.05$) of all outcome measures gradually decreased between T2 and T4 in the intervention group; nevertheless, these positive findings confirmed that personalized video narratives were able to motivate and influence MUSE and its associated factors among post-stroke patients. The significant improvement in medication-taking self-efficacy and the sustenance of BP monitoring habits among patients in the intervention group strengthened our conceptual framework's practicality.

Keywords: video narratives, Health Belief Model, medication understanding and use self-efficacy, patient education, randomized controlled trial, stroke

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Plain Language Summary

Health care professionals had always found it a huge task to exert appropriate self-efficacy habits in managing prescribed medication among patients with stroke. Furthermore,

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socioeconomic and cultural differences add more barriers between them. The video narratives technique is a promising tool to improve medication-taking issues, but it was untested among post-stroke patients in Malaysia. Hence, we ran a one-year trial of the video narrative intervention on these patients, separated into two groups. The control group received the hospital's standard care, whereas the trial group received similar care and the intervention. The trial's impact was on behavioral changes, especially on the self-efficacy of understanding and taking medication appropriately, blood pressure control and monitoring habits, and other factors, such as knowledge retention, illness perception, and medication beliefs. As per speculation, the video narratives had successfully induced an improvement in the targeted behavior changes, which gradually sustained until the completion of the trial compared to the control group. We believed that the persuasive tone and personalized peer messages would have contributed to this progress. Though limitation existed, the video narratives technique has proven its benefit and practicality among post-stroke patients with specific needs such as motivation, and resilience.

Introduction

Stroke is the second common cause of deaths and disability occurrences worldwide.[1] It causes a significant impact in a developing country like Malaysia.[2] Approximately 23% of stroke cases were stroke recurrence, and one of its contributing factors was treatment nonadherence.[2–4] Despite many efforts in the 'stroke and its risk factor-patient education innovation' revolving medication adherence, medication understanding, and taking behavioral issues remains a challenge for many healthcare professionals. It is because the health-related behavioral modification involves the individuals' and social perception towards their illness and its preventative measures. Moreover, the patients' past experiences and willingness to change influence these perceptions.[5] Therefore, the self-efficacy concept is believed to be a trigger factor towards proactivity and positive healthcare actions. This concept has been implemented in numerous patient education strategies with measurable outcomes.[6]

However, these interventions have had mixed results due to methodology and population heterogeneity. Also, programs that target specific needs would require emotional and cultural touch apart from being only conceptually applicable to be effective.[7] Thus, narrative communication would deliver a suitable mechanism in influencing the listeners as they actively engage with the information or story. Therefore, inspired by these knowledge gaps, the researchers pursued to experiment on motivational narratives of a neurologist and a patient to encourage post-stroke patients' self-efficacy in medication understanding and its appropriate usage.

It has become apparent that successful engagement is portrayed by persistence towards the delivered messages compared to cognitive justification.[8] Nevertheless, to obtain a good ratio of patient education engagement depends very much on its presentation form. Studies have shown that we get absorbed and focused better via visual and hearing senses.[9] Behavioral modification research found that multimedia in an audio-visual format was an effective approach.[10] Hence, narratives incorporated with behavioral health constructs, delivered in a video format could be an appropriate strategy for addressing medication-taking issues that lack self-efficacy in medication understanding and use (MUSE). With all this information in hand, the researchers hypothesized that this intervention would have an effect or significant change on MUSE over the 12 months trial period.

Materials and Methods

Study Design

A single-blind, randomized controlled trial (RCT) was conducted among 216 post-stroke patients who were randomly assigned to receive either a combination of video narratives and the standard care intervention or standard care alone. The main assumption was that patients who received the intervention would perceive a better MUSE, compared to the control group patients. The intervention was delivered at baseline: T0, three months: T1, and six months: T2. Whereas, RCT outcomes were only ascertained at baseline: T0, six months: T2, and 12 months: T4 as per feasibility and acceptability study feedback on patients' varied clinic follow-up period, which spanned between four to five months. Figure 1 depicts the trial's summarized flow chart.

The design and conduct of the trial adhered to the revised Consolidated Standards of Reporting (CONSORT) guidelines[11] and to the Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT).[12] Whereas the study procedures were approved by the Malaysian Medical Research and Ethics Committee—MREC (NMRR ID-15-851-24,737) and the Monash University Human Research Ethics Committee—MUHREC (ID 9640), followed by the trial's registration with the Australian New Zealand Clinical Trials Registry—ANZCTR (ACTRN12618000174280), Universal Trial

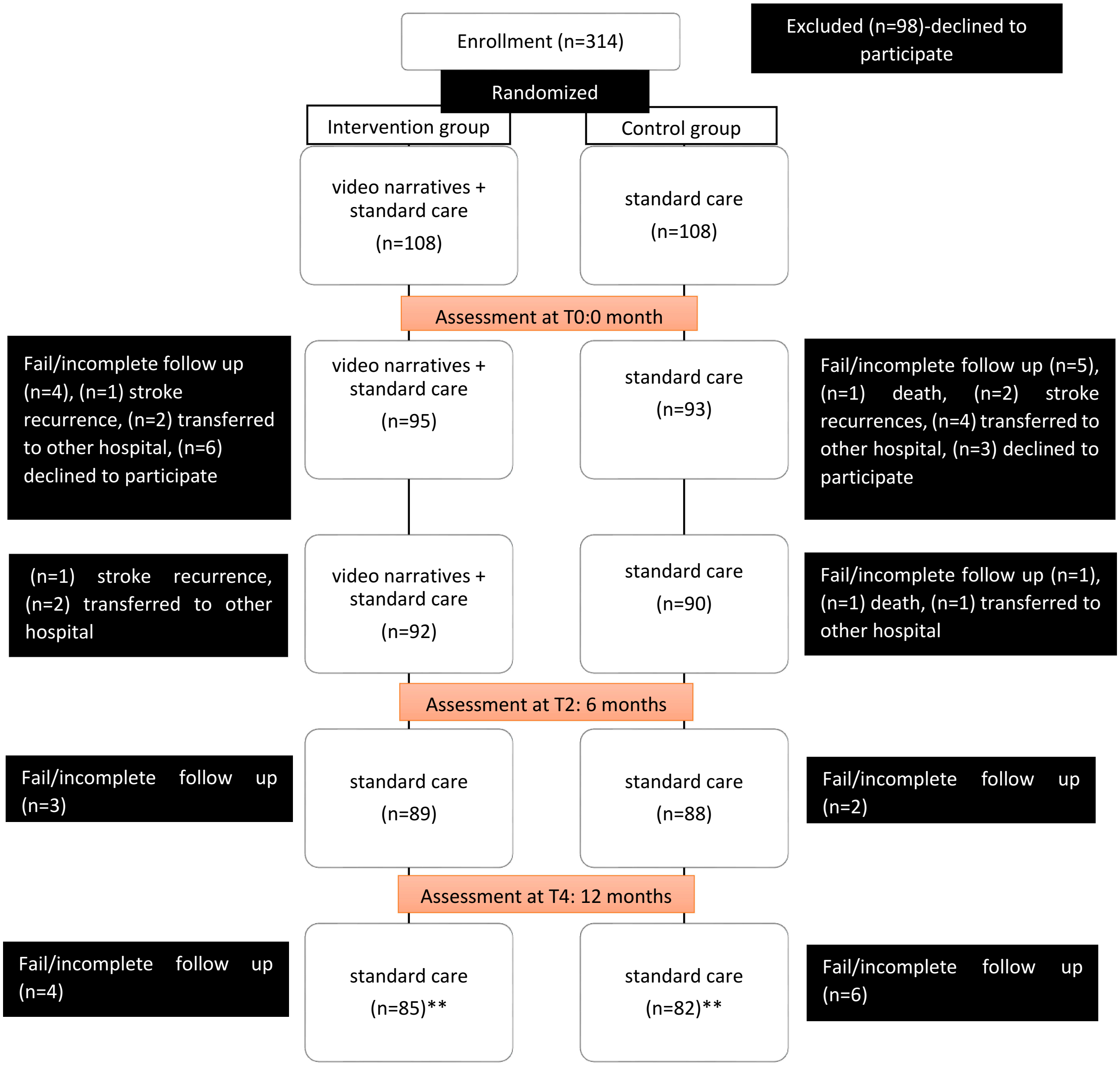

Figure 1 Flowchart of the trial. **Patients available for analysis. Nevertheless, intention-to-treat analysis (ITT) was undertaken. Therefore, finalized number of patients for analysis were 108 of them from each group.
Abbreviations: T0, baseline; T2, 6th month; T4, 12th month.

Number (UTN) U1111-1201-3955. The trial was conducted in accordance with the Declaration of Helsinki. The trial's protocol has been published previously.[13]

Study Population

Informed and written, consented patients were from the outpatient Neurology Clinic at Hospital Kuala Lumpur (HKL). HKL receives a high referral number of stroke patients from many areas around Klang Valley and other areas in Malaysia. The study included patients who are adults, aged 18 years and above, of satisfactory literacy and those who received the diagnosis of their first stroke within six months of the recruitment period. As most patients were primarily hypertensive, it was essential to include patients who were also prescribed antithrombotic and antihypertensive medication. However, only those who were able to comprehend in English or Malay language were eligible in the trial. Besides, those patients with cognitive impairment or psychological issues (Patient Health Questionnaire; PHQ-9 score ≥1 and Montreal Cognitive Assessment; MoCA score <26) were not eligible for participation.

Sample Size

Sample size estimation conferred to average effect sizes from comparable studies associated with parallel behavioral modification framework.[14–17] Therefore, with the inclusion of 0.05 alpha, and with the power of 0.80, the RCT required 100 patients in each group.[18] However, the study targeted to recruit about 230 patients for a projected 10–15% attrition rate.

Randomization and Study Procedures

A staff nurse who was not involved in the trial randomly allocated patients to either the control or intervention group. The assignment was from a list of number blocks of varying lengths, placed in opaque envelopes to ease randomization and avoid bias. These procedures took place as post-baseline screening. Patients from the control group received ongoing referrals within various healthcare departments, eg, rehabilitation, speech therapy, medication and nutritional counseling, medication therapeutic and adherence clinic (MTAC), and short message service (SMS) appointment reminders. The neurologists also observed patients' clinic appointment attendance and advised their patients to perform self-care monitoring. Apart from this, only the intervention group received face-to-face video narratives. Nevertheless, both groups were given printed materials on stroke treatment. They participated in the "teach-back-method" by the clinical pharmacist to moderate the knowledge and health literacy inconsistencies between both groups.[19,20] Reminders were sent to all patients up to three times to retain trial participation. However, those who failed to respond were considered as a drop-out. Nonetheless, there were no occurrences of un-blinding of the patient's allocation. Therefore, respective groups underwent similar study procedures, whereby; patients first met their neurologists, then continued with blood pressure assessment and performed self-administered outcome measurement. Several minutes consequently, only those allocated to the intervention group were followed-up with video viewing at allocated timelines as depicted in Figure 1.

The Intervention

Based on post-stroke patients' needs in Malaysia,[21] two sets of video narratives (in English and the Malay language) were previously designed to enhance MUSE.[23] (Video 1, Video 2, Video 3 and Video 4). The behavioral constructs of the Health Belief Model (HBM)[22] built a connected storyline which depicted a neurologist perspective on illness and treatment and a patient's experiences in dealing successfully with stroke recovery. The scripts were initially developed in English and then translated into the Malay language. Following that, the back translation process by a linguistic expert validated the consistency of sentences and meanings. Finally, an expert panel of doctors, pharmacists, educationists, and stroke patients reviewed and edited the scripts and videos several times. The short messages were culturally appropriate quotes to increase patients' awareness and to change negative perceptions. The motivational messages focused on self-efficacy, especially in self-managing prescribed medication and stroke risk factors. Hence, to strengthen the engagement aspects of statements, both; an actual neurologist and a post-stroke survivor rendered their narratives with authentic feelings. Common themes encompassed the narratives; nevertheless, each story focused on different perceived angles and tones.

Outcomes

The main outcome was the observation of changes in MUSE. It is an "eight-item Likert-scale," which measures a patient's self-efficacy perception in understanding and taking their medication. Patients were either asked to choose (using the Strongly Disagree (1); Slightly Disagree (2); Slightly Agree (3), and Strongly Agree (4) response options), or, otherwise asked if they disagree or agree with the statement which then branches out further if they Strongly or Slightly Disagree or Agree. For example, if a patient answered "Strongly disagree" to every single item, his or her score would be 8. Whereas, if they selected "Strongly agree" to every single item, their score would be 32. MUSE has good internal consistency (Cronbach's alpha >0.7) with acceptable construct and predictive validity. It was applied for three medication categories; antithrombotic, antihypertensive, and "all prescribed medication" to evaluate in-depth differences between these groupings.[24] Nevertheless, given that MUSE is closely linked to knowledge, perception, and belief of every individual,[4] secondary validated measures were necessary, to be able to understand the video narratives' impact on modifiable dependent factors.

The Stroke knowledge test (SKT), a self-administered questionnaire was used to assess patients' knowledge of stroke illness and its treatment. It consists of 20 items with scores between 0 to 20 to estimate knowledge level differences between individuals and groups.[25,26] Whereas, the

Brief illness perception questionnaire (BIPQ)[27,28] and the Belief about medicine questionnaire (BMQ)[29,30] have been globally used in various healthcare settings to measure patients' illness perception and beliefs towards their prescribed medication. The BIPQ consists a "nine-items" with eight items of Likert scale scoring range from "0 to 10′, which represents patients" attitudes and concerns about their disease whereby total higher scores reflect threatening views of illness. Similarly, the BMQ 18-item questionnaire uses scales that measure medication beliefs in general and specific concepts about medicine of a disease condition. Ascending total scores of >47 signifies sturdier negative beliefs about medicine.

The self-report of BP self-monitoring frequency was also documented per visit at allocated timelines. We hypothesized that positive behavior changes in MUSE would reflect on patients being more concerned of stroke risk prevention. Hence, there would be a rise in blood pressure (BP) self-monitoring activity, translating their effort on BP control. The patients' "last two" averaged systolic and diastolic blood pressure readings were taken using similar calibrated blood pressure measurement devices at the neurology clinics. BP control, according to stroke guidelines, was considered as at or below 140/90 mmHg for patients with no diabetes, while for those with diabetes, the BP control is as at or below 130/80 mmHg.[31,32]

Data Handling and Analysis

Two independent researchers, blinded to randomization, performed data entry and verification. The researchers ensured data confidentiality and appropriate safekeeping in the repository center (Lab Archives), of Monash University Malaysia. Statistical analysis was conducted using IBM SPSS Statistics V.24.0 with P<0.05 as the significance level. The preliminary analysis consisted of descriptive statistics as means and SDs or frequency distributions of demographic and clinical characteristics. Chi-square ($\chi 2$) or equivalent analysis concluded the association between categorical variables, whereas, independent *t*-test or equivalent analysis confirmed the mean differences of continuous outcome variables. The two-way repeated measures of Multivariate Analysis of Variance (MANOVA) determined variances in multiple dependent variables over three-time points data; baseline: T0, six months: T2, and 12 months: T4. Data were evaluated based on an intention-to-treat analysis, with the application of Last Observation Carried Forward (LOCF) principles.[33]

Results

Patient Characteristics

More than 450 patients went through the screening phase during RCT recruitment, but only 314 patients were eligible for the trial. From this number of patients, 98 of them declined their consent to participate. The common reasons for refusing enrolment were language barriers and fear of commitment or stress. However, during the 12 months' follow-up, the trial experienced a dropout-rate of (49/216) 22.7%. The most reasons for trial incompletion were loss of contact and patients transferred to other hospitals.

Table 1 presents the socio-demographic data of patients randomized at baseline. There were no significant differences in variable and socio-demographic characteristics between both groups except for ethnicity (p=0.046). There were about 20% more male patients than females with the dominance of a higher number of the Malay race in both groups (>50%). Patients were between 20 and 90 years old, with a majority of about 80% completed secondary education. This percentage adds on with almost similar adequate health literacy percentages but with higher unemployment rates (>60%). A majority of patients (>90%) had an ischemic stroke with primary hypertension. On average, 60% of them also had diabetes, and many suffered from several underlying stroke risk factors, eg, hyperlipidemia and arrhythmia. Slightly more than 80% of patients were prescribed with three or more types of stroke preventative medication. However, lifestyle factors such as diet and obesity were not inclusive in the list due to incomplete medical history documentation and researcher expertise. The mean MUSE score (<24) of both groups indicated inadequate perceived understanding and use self-efficacy, and the score of BIPQ and BMQ (≥50) between them paralleled higher threat of illness and negative belief about medicine. Both groups presented with limited stroke knowledge score (<10), poor BP control (≥140mmHg), and reported an average of two times per week of BP self-monitoring. All data were multivariate normally distributed.

The Intervention's Effect on MUSE and Its Associated Factors at T0, T2, and T4 Among Post-Stroke Patients

Repeated measures MANOVA analysis revealed that there was a significant difference between intervention and control group when considered an overall effect of the viewing of behavioral health-constructs-incorporated video narratives on MUSE and its associated factors,

Table 1 Socio-Demographic Data of Patients at Baseline (n=216)

Characteristics		Control n=108 (%)	Intervention n=108 (%)
Gender	Male	73 (67.6)	69 (63.9)
	Female	35 (32.4)	39 (36.1)
Age (years)	≥ 60	52 (48.1)	45 (41.7)
	40 - 59	46 (42.6)	51 (47.2)
	≤ 39	10 (9.3)	12 (11.1)
		57 ± 12.2[c]	54 ± 12.4[c]
Ethnicity	Malay	63 (58.3)	77 (71.3)
	Chinese	11 (10.2)	14 (13.0)
	Indian	31 (28.7)	16 (14.8)
	Others	3 (2.8)	1 (0.9)
Education completion	Primary	22 (20.4)	20 (18.5)
	Secondary	62 (57.4)	59 (54.6)
	Tertiary	24 (22.2)	29 (26.9)
Health literacy[a]	Adequate	85 (78.7)	84 (77.8)
	Limited	23 (21.3)	24 (22.2)
Employment	Employed	44 (40.7)	47 (43.5)
	Unemployed	64 (59.3)	61 (56.5)
Types of stroke[b]	Ischemic	91 (84.2)	93 (86.1)
	Hemorrhagic	3 (2.8)	6 (5.6)
	TIA	14 (13.0)	9 (8.3)
Stroke comorbidities	Hypertension	30 (27.8)	29 (26.9)
	Hypertension and other risks*	69 (63.9)	73 (67.5)
	Diabetesandother risks*	9 (8.3)	6 (5.6)
Prescribed medication (types)	≥ 2	15 (13.9)	18 (16.7)
	≥ 3	93 (86.1)	90 (83.3)
Systolic pressure (mmHg)		141 (20.7)[c]	140 (21.3)[c]
MUSE score		23 (5.3)[c]	23 (5.4)[c]
SKT score		7 (3.5)[c]	6 (3.6)[c]
BIPQ score		51 (11.1)[c]	50 (12.1)[c]
BMQ score		51 (6.2)[c]	50 (6.2)[c]
BP monitoring frequency		2 (0.8)[c]	2 (0.9)[c]

Notes: [a]Assessed based on The Newest Vital Sign, [b]Stroke code ICD-10, [c]Mean ± SD. *Inclusive of modifiable stroke risk factors other than hypertension, eg, diabetes, heart diseases, hyperlipidemia, current smoking/alcohol.

Abbreviations: BIPQ, Brief Illness and Perception Questionnaire; BMQ, Belief About Medicine Questionnaire; BP, blood pressure; MUSE, medication understanding and use self-efficacy; SKT, stroke knowledge test; TIA, transient ischemic attack.

Roy's Largest Root=1.201, $F (16,199) = 14.94$, $p<0.001$, $\eta 2=0.546$. A weak relationship, r= (0–0.3, $p<0.05$) coexisted between demographic variables (age, gender, and health literacy) and several outcome measures such as MUSE and BP monitoring; nevertheless, a temporal relationship could not be established and unreliable due to uneven ratio in the samples. Hence, univariate analysis of the intervention's effect on outcome measures and behavioral changes is described further in the following sections.

Impact on MUSE Categorical Scores and BP Control

The difference between both groups on MUSE categories overtime was significant for "all prescribed medication" (F (1.543, 330.30) =42.99, $p<0.001$, $\eta 2=0.167$), antithrombotic (F (1.279, 273.76) =6.91, $p=0.005$, $\eta 2=0.205$), and antihypertensive (F (1.24, 264.39) =12.22, $p<0.001$, $\eta 2=0.195$) (Table 2). We also observed significant mean score differences between the intervention and control group for these categories; (F (1214) =12.41, $p=0.001$, $\eta 2=0.055$), (F (1214) =5.10, $p=0.025$, $\eta 2=0.023$), and (F (1214) =7.25, $p=0.008$, $\eta 2=0.033$) respectively. Nevertheless, a post hoc pairwise comparison using Bonferroni correction discovered only improved significant score differences ($p<0.025$) between baseline assessment (T0) and six months follow-up (T2) in both groups for the three categories (Table 3). On the other hand, except for the "all prescribed medication" MUSE intervention group category, the antithrombotic and antihypertensive categories eventually leveled at significant score variances ($p<0.05$) between T2 and T4 (12 months follow-up). However, the control group's score differences did not reach significance between T2 and T4 (Figure 2AC).

Following similar trends, the BP self-monitoring also observed significant frequency differences between the intervention and control group (F (1214) =5.23, $p=0.023$, $\eta 2=0.024$) with substantial interactions between timelines and study groups (F (1.585, 339.19) =12.49, $p<0.001$, $\eta 2=0.055$) (Table 2). Furthermore, both of their post hoc pairwise comparisons showed improved significant frequency differences ($p<0.05$) between T0 and T2 but non-significance ($p>0.05$) between T2 and T4 (Table 3 and Figure 2H).

Nonetheless, the systolic BP analysis presented different trends. Within-group analysis, only the intervention group showed significant mean measurement differences (F (1.335, 142.81) =35.67, $p<0.001$, $\eta 2=0.250$) and at post hoc, pairwise comparisons of all timelines; T0 vs T2, T0 vs T4, and T2 vs T4 compared to the control group (Tables 2 and 3). Though BP measure differences were non-significant between the groups ($p=0.552$), repeated measure analysis displayed significant mean differences between intervention and control group on BP control over time (F (1.344, 287.55) =8.54, $p<0.001$, $\eta 2=0.038$). These results corresponded with a continuous BP control in the intervention group, as depicted in (Figure 2D).

Table 2 Groups' Comparison at Various Timelines

		Timeline (Month)			Within Group			Between Groups			(Timeline*Group)		
		T0 (SD)	**T2 (SD)**	**T4 (SD)**	**F**	**p**	**η2**	**F**	**p**	**η2**	**F**	**p**	**η2**
MUSE[a]	I	22.97 (5.17)	27.27 (3.25)	27.81 (2.52)	97.00	<0.001**	0.475	12.41	0.001**	0.055	42.99	<0.001**	0.167
	C	23.71 (5.44)	24.62 (4.03)	24.42 (4.02)	5.61	0.010*	0.050						
MUSE[b]	I	25.00 (5.85)	27.82 (2.96)	28.38 (3.23)	42.05	<0.001**	0.282	5.10	0.025*	0.023	6.91	0.005*	0.205
	C	24.75 (5.80)	26.29 (4.97)	26.28 (4.88)	14.76	<0.001**	0.121						
MUSE[c]	I	25.61 (5.71)	28.88 (3.43)	28.19 (3.18)	49.11	<0.001**	0.315	7.25	0.008*	0.033	12.22	<0.001**	0.195
	C	25.29 (5.61)	26.39 (5.02)	26.25 (4.73)	8.22	0.003*	0.071						
Sys/BP	I	141.68 (20.21)	134.26 (14.96)	135.71 (13.88)	35.67	<0.001**	0.250	0.35	0.552	0.002	8.537	0.001**	0.038
	C	139.89 (21.31)	137.59 (15.78)	138.11 (15.73)	3.37	0.055	0.031						
SKT	I	7.47 (3.40)	9.34 (3.09)	9.79 (3.11)	137.64	<0.001**	0.563	11.54	0.001**	0.051	32.39	<0.001**	0.131
	C	6.83 (3.59)	7.49 (3.36)	7.81 (3.28)	42.93	<0.001**	0.286						
BIPQ	I	52.08 (10.06)	47.44 (9.29)	47.79 (8.81)	53.84	<0.001**	0.335	1.73	0.190	0.008	34.16	<0.001**	0.104
	C	50.76 (12.12)	51.08 (11.89)	51.15 (12.77)	0.42	0.594	0.004						
BMQ	I	51.46 (6.22)	48.22 (6.31)	47.57 (6.15)	51.39	<0.001**	0.324	15.93	<0.001**	0.069	71.76	<0.001**	0.251
	C	50.91 (6.22)	52.76 (7.11)	53.74 (8.00)	23.82	<0.001**	0.182						
BP/Mon	I	2.41 (0.94)	2.76 (0.98)	2.87 (1.04)	27.34	<0.001**	0.204	5.23	0.023*	0.024	12.49	<0.001**	0.055
	C	2.33 (0.89)	2.44 (0.91)	2.44 (0.89)	5.74	0.006*	0.051						

Notes: [a](all medication), [b](antiplatelet), [c](antihypertensive), *The mean difference is significant at p<0.05, **Adjustment for multiple comparisons: Bonferroni p<0.001.
Abbreviations: BIPQ, Brief Illness and Perception Questionnaire; BMQ, Belief About Medicine Questionnaire; BP, blood pressure; BP/Mon-BP monitoring; CI, confidence interval; C, control group; I, intervention group; MUSE, medication understanding and use self-efficacy; SKT, stroke knowledge test; Sys/BP-systolic BP; T0, baseline; T2, 6th month; T4, 12th month.

Impact on SKT, BIPQ and BMQ Scores

Overall, the SKT evaluation of both intervention and control group presented with significant interactions between mean scores at timelines and study groups (F (1.427, 305.35) = 32.39, p<0.001, n2= 0.131) and substantial mean score differences between groups (F (1214) =11.54, p=0.001, η2=0.051). Significance was also present within both groups; intervention (F (1.372, 146.81) = 137.64, p<0.001, η2=0.563) and control (F (1.501, 160.58) = 42.93, p<0.001, η2=0.286) respectively. Furthermore, pairwise comparisons at T0 vs T2, T0 vs T4, and T2 vs T4 of both groups resulted in substantial score differences. However, patients in the intervention group performed with higher SKT mean scores at all time-points; compared to the control group (Tables 2 and 3, and Figure 2F).

The interventions effect on BMQ scores were comparable with the SKT trends, whereby, score variance significance occurred within groups; the intervention group (F (1.474, 157.69) = 51.39, p<0.001, η2= 0.251) and the control group (F (1.587, 169.78)=23.82, p<0.001, η2=0.182) and for the interactions between mean scores at timelines and study groups (F (1.531, 327.69)= 71.76, p<0.001, η2= 0.251). As well as, substantial mean score differences between groups; (F (1214) =15.93, p<0.001, η2=0.069) (Table 2). Figure 2G illustrates an opposing gradual increment of average means between both groups, which reflected the significant post hoc pairwise comparison (p<0.05) between T0 vs T2 and T0 vs T4 for both of the groups.

On the other hand, the BIPQ score analysis showed diverse trends. The control group showed no significant differences for neither within groups nor post hoc pairwise contrasts compared to the intervention group. Nevertheless, there were no significant score differences (p>0.05) between both groups too. However, Figure 2E depicts a notable decrease in the mean score, which reflected significant score differences within the intervention group (F (1.688, 180.63) = 53.84, p<0.001, η2=0.335) and remarkable pairwise comparisons between baseline scores and six months' follow-up. Furthermore, significant interactions between mean scores at all timelines and study groups (F (1.600, 342.36) =34.16, p<0.001, η2=0.104) were documented (Tables 2 and 3).

Discussion

As per our knowledge, this is the first RCT of a video narrative intervention for post-stroke patients in Malaysia. Moreover, the video narratives had a notable effect on those diagnosed with first ischemic stroke incidence and were primarily hypertensive. The narratives which were

Table 3 Pair Wise Comparison Between Timelines (T0, T2, T4)

		T0 vs T2			T0 vs T4			T2 vs T4		
		Δ T2-T1(SE)	CI	p	Δ T4-T0(SE)	CI	p	Δ T4-T2(SE)	CI	p
MUSE[a]	Intervention	–4.29* (0.36)	-5.17- -3.42	<0.001	–4.83* (0.47)	-5.97- -3.69	<0.001	–0.54 (0.29)	-1.25- 0.18	0.211
	Control	–0.91* (0.32)	-1.67- -0.13	0.017	–0.70 (0.33)	-1.51- 0.10	0.110	0.20 (0.17)	-0.22- 0.62	0.720
MUSE[b]	Intervention	–2.82* (0.46)	-3.94- -1.71	<0.001	–3.39* (0.46)	-4.51- -2.27	<0.001	–0.57* (0.22)	-1.11- -0.02	0.038
	Control	–1.54* (0.39)	-2.49- -0.59	<0.001	–1.53* (0.38)	-2.47- -0.58	<0.001	0.01 (0.13)	-0.29- 0.32	1.00
MUSE[c]	Intervention	–3.27* (0.39)	-4.21- -2.33	<0.001	–2.57* (0.43)	-3.62- -1.53	<0.001	0.69* (0.16)	0.29- 1.09	<0.001
	Control	–1.10* (0.34)	-1.93- -0.27	0.005	–0.95* (0.35)	-1.82- -0.09	0.025	0.15 (0.14)	-0.19- 0.49	0.887
Systolic BP	Intervention	7.42* (1.06)	4.85- 9.99	<0.001	5.96* (1.11)	3.27- 8.65	<0.001	–1.45* (0.51)	-2.69- -0.22	0.015
	Control	2.31 (1.08)	-0.31- 4.92	0.103	1.79 (1.09)	-0.86- 4.43	0.310	–0.52 (0.52)	-1.78- 0.74	0.954
SKT	Intervention	–1.87* (0.16)	-2.26- -1.48	<0.001	–2.32* (0.18)	-2.75- -1.88	<0.001	–0.44* (0.09)	-0.66-0.234	<0.001
	Control	–0.66* (0.11)	-0.92- -0.39	<0.001	–0.98* (0.13)	-1.31- -0.66	<0.001	–0.32* (0.08)	-0.51- -0.14	<0.001
BIPQ	Intervention	4.64* (0.52)	3.36- 5.91	<0.001	4.28* (0.57)	2.90- 5.67	<0.001	–0.35 (0.38)	-1.28- 0.58	1.000
	Control	–0.32 (0.43)	-1.38- 0.73	1.000	–0.39 (0.57)	-1.77- 0.99	1.000	–0.07 (0.33)	-0.87- 0.74	1.000
BMQ	Intervention	3.24* (0.41)	2.23- 4.25	<0.001	3.89* (0.51)	2.66- 5.12	<0.001	–0.98* (0.31)	-1.74–0.22	<0.001
	Control	–1.85* (0.42)	-2.86- -0.84	<0.001	–2.83* (0.50)	-4.05- -1.61	<0.001	0.65 (0.28)	0.04- 1.34	0.072
BP monitoring	Intervention	–0.35* (0.07)	-0.51- -0.19	<0.001	–0.46* (0.08)	-0.66- -0.27	<0.001	–0.11 (0.05)	-0.23- 0.01	0.068
	Control	–0.10* (0.04)	-0.19- -0.01	0.021	–0.10* (0.04)	-0.19- -0.01	<0.001	0.00 (0.03)	-0.06- 0.06	1.000

Notes: [a](all medication), [b](antiplatelet), [c](antihypertensive), *The mean difference (Δ) is significant at p<0.05, Adjustment for multiple comparisons: Bonferroni p<0.001.

incorporated with HBM constructs and catered post-stroke patients' needs have necessitated a relatively positive impact on MUSE and other associated factors such as SKT, BMQ, and BIPQ compared to the control group. The intervention successfully assisted post-stroke patients in maintaining BP control, perhaps through behavioral regulation to being self-efficacious and proactive in illness management. It was also possible that the advantage of having culturally appropriate narrators and empathizing tones broke the language barriers whereas, the "highlighted" quotes, which acted as meaningful cues to action, motivated patients to change their illness and treatment perception or belief.

According to a review paper, the authors concluded that there were limited evidence to determine the effectiveness of narrative communication moreover the audio-visual technique as a tool for behavior change.[34] Although there were no trials or lack evidence about the theoretical and conceptual framework efficacy comparable to our study population at this point in time, we propose some explanation with relevant studies to support our findings. A previous study on narrative communication with cancer patients suggested that the para-social interaction mediated by narrators in mass media advocated behavior-change quotes that created the feeling of being understood by peers among the patients.[35] Similarly, another research work on a storytelling method enhanced realism by trained actors heightened the awareness and satisfactory BP control among their hypertensive patients.[36] Therefore, it was concluded that the actual "storytellers" of a doctor and a patient in this RCT have succeeded in decreasing cognitive resistance[37] and allowed changes in beliefs and perceptions among post-stroke patients.

The personalized HBM content according to patients' needs influenced the behavioral entity of self-efficacy in understanding and taking medication which also warranted the applicability of HBM constructs among hypertensive-stroke risk patients.[38] A simple bivariate analysis discovered that there was some correlation (r= 0–0.3, p<0.05) between MUSE and BP monitoring activity, that sustained until trial completion. A similar trend was also with beliefs about illness and its treatment. The findings deduced that most of the primarily hypertensive patients sensed the same connections towards our storyteller, who himself experienced a major ischemic stroke caused by uncontrolled hypertension. Therefore, the narratives' persuasion impact reflected in the gradual improvement of the perceived MUSE categorical outcomes and BP monitoring activity. We established an understanding of the narratives' promotion of homophily, from an observation on the

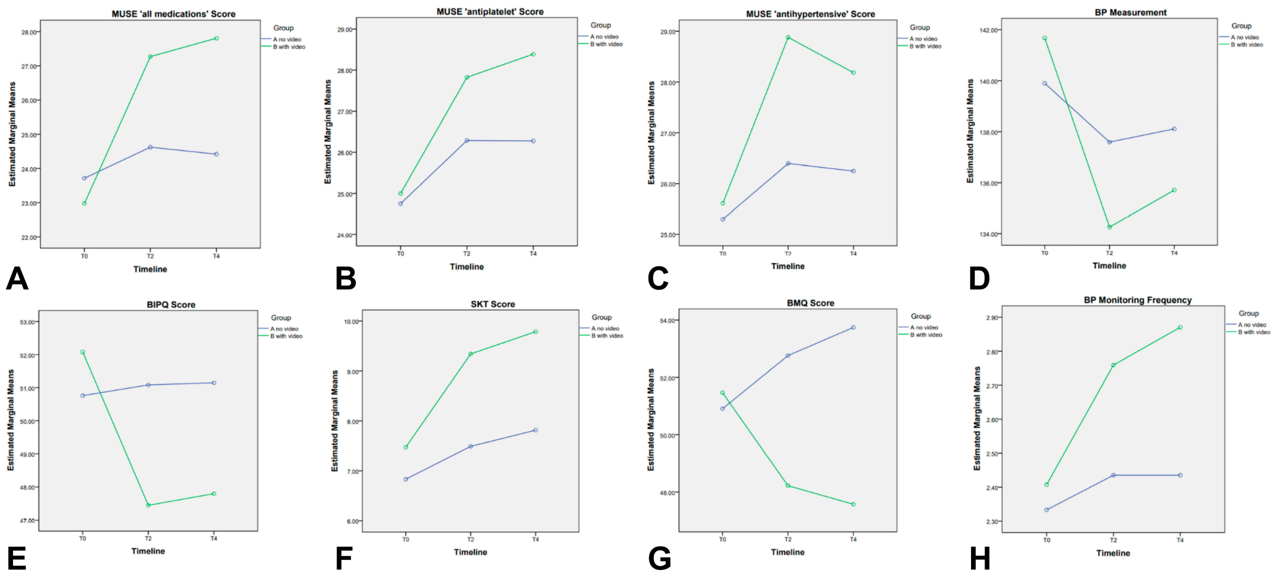

Figure 2 Changes in mean score, measurement and frequency of outcome measures within timeline for control and intervention groups. (**A**) Changes in mean score of the medication understanding and use self-efficacy (MUSE) "all medications" within timeline. (**B**) Changes in mean score of the medication understanding and use self-efficacy (MUSE) "antiplatelet" within timeline. (**C**) Changes in mean score of the medication understanding and use self-efficacy (MUSE) "antihypertensive" within timeline. (**D**) Changes in the blood pressure (BP) measurement within timeline. (**E**) Changes in mean score of the brief illness and perception questionnaire (BIPQ) within timeline. (**F**) Changes in mean score of the stroke knowledge test (SKT) within timeline. (**G**) Changes in mean score of the belief about medicine questionnaire (BMQ) within timeline. (**H**) Changes in the blood pressure (BP) monitoring frequency within timeline.
Abbreviations: T0, baseline; T2, 6th month; T4, 12th month.

prolonged behavior sustenance period of specific MUSE categorical outcomes.[35] This conclusion was based on a systematic review of behavioral interventions[39] that documented similarity of systolic blood pressure mean reduction for patients from the intervention group.

Health literacy is a predictive factor of education retention among patients with stroke.[40] A bivariate analysis of our RCT data confirms this linear relationship. Also, a previous work of ours in a similar patient population discovered that MUSE is positively associated with health literacy, illness perception, and treatment beliefs.[4] Hence, there was some evidence to elucidate the efficacy of the behavioral and motivational framework and use of media technology of this trial resulting in rapid improvements in SKT, BIPQ, and BMQ.

During the RCT patient recruitment, though health literacy was adequate among post-stroke patients, the SKT baseline scores indicated limited stroke knowledge, demonstrating a lack of information reinforcement. The continuous exposure to informational brochures and counseling services provided by the hospital staff improved the SKT mean score in both groups. Nevertheless, the intervention group maintained a better SKT score improvement compared to their counterpart. This phenomenon is clearly explained by Wise et al, who researched the didactic and narrative approaches to improve health outcomes. The authors deduced that narratives enabled a better reinforcement of knowledge that patients retrieved initially compared to the didactic approach alone.[41] This approach was also supported by a recent study on learning pedagogy using digital storytelling.[42] Thus, the video narratives intervention had successfully induced a fortified method of understanding the management of illness.

According to the Social Learning Theory by Albert Bandura, our cognitive process is versatile to various inputs which contributes to the acquisition of new behaviors or skills.[43] Therefore, the habit of frequent BP monitoring with appropriate medication management created a learning opportunity for patients, eg, adhering to antihypertensive medication to reduce their blood pressure, which led to improved scores. The style of managing their medication differs individually. Still, BIPQ and BMQ outcome measures managed to capture the intervention's continuous positive impact with regards to enhanced illness perception and treatment belief. The possible mechanism of these findings could be associated with the "principles of foresight" which debates between patients will power and rational action as in this context for a better health outcome.[44] Speaking of which, stroke survivors, especially with disabilities or with various comorbidities, would require tremendous effort and psychology stability to prepare for prolonged time improvement rather than being impatient and relying on short rewards. Furthermore, external social influence plays a vital role in developing the appropriate “rational” thoughts on the purpose of improving one’s illness. Hence, the video narratives provided a motivational platform and a useful reminder for patients to be resilient and continue to learn via the rewards of learned skills. Hence, repeated viewing of the video is needed to sustain the impact on health and medication-taking behavior.

Study Strengths and Limitation

Patients with stroke require unique strategies that aptly address diverse personal cognitive and emotional demands regarding external barriers such as language, culture, and belief apart from institutional healthcare facilities. Thus, this trial focused on a behavioral modification approach to overcome major personal obstacles, eg, self-efficacy, motivation, and negative illness and its treatment perception.[21] Through the qualitative feedback,[23] the patients appreciated the healthcare professional who helped them increase the awareness of illness management and stroke prevention. They were receptive of the audio-visuals featuring their pain and challenges, moreover, towards their peer, who boldly stepped forward to share his success and strength in managing his stroke condition. Thus, the integration of behavioral and motivational theories with an adaptation of the Information-Motivation-Behavior framework and media technology has reflected noble translational research in an actual healthcare setting. The intervention aimed to develop a potential tool to assist the behavioral modification component of the Medication Therapy Adherence Clinic (MTAC) services in line with patient education strategy. Furthermore, this trial well identified and adapted specific outcome measures, especially MUSE, which was also a potential predictor of medication adherence.[4]

Nevertheless, this study has its limitations. More than 15% of the estimated attrition rate could have affected estimates of effect size for the intervention. These RCT findings may also not apply to other post-stroke patient populations seeking treatment in different settings such as primary health clinics and private medical centers. Furthermore, due to time and lack of funding support, the full understanding of the intervention’s sustainability was inadequate, though the frequency and duration of exposure were within the ideal period.[45] Nonetheless, there were difficulties in maintaining a face-to-face video-viewing gap period of 3 months due to changes in patients’ appointment dates. Besides, changes in prescribing practice of antihypertensive medications during the appointment gaps could have affect BP measurement sustenance. Following this setback, the researcher had no video narratives translated in the Mandarin or Tamil languages, which could have optioned out eligible patients who would have benefitted using the tool. The significant ethnicity differences between groups could have also contributed as a confounding factor. Other than that, there was a likelihood that patients were looking forward to new videos, which could have hampered their follow-up interest. On top of that, the study received a high-unfilled non-response rate for the Short Form (36) Health Survey (SF36) that was unforeseen in a previous feasibility study. Besides, limited sample size and lack of other blood parameter data, eg, HbA1c, fasting blood glucose, lipid profile, and INR, hindered further stratified analysis of each video’s effect on various patients’ group characteristics. Even so, possibilities existed that concurrent service and care from HKL may have been present as bias or threat to the effect on knowledge retention and systolic blood pressure management. Nevertheless, despite all these limitations, the significant improvement in medication-taking self-efficacy, belief of illness, and its treatment in the intervention group and BP monitoring habit strengthened the practicality of our conceptual framework.

Conclusion

This trial was an opportunity of a translational research discovery of “theory to practice” whereby we tested the applicability of the intervention in an actual healthcare setting. Hence, our future research direction aims to explore affordable media technologies which could be accessed by specific patient populations with various beliefs and socioeconomic background. However, even though the narrative contents may be irrelevant to other cultures or specific illness conditions, the conceptual framework, feasibility, and storytelling concepts could be easily personalized to other chronic diseases. This scenario indicates a prerequisite for a future trial of innovative patient education interventions with more unrelenting power-on behavior modification. However, the option is upon researchers’ discretion and consideration of the needs of the target population.

Data Sharing Statement

All data are not publicly available to maintain patient record confidentiality and are within the judiciary of the Director General of Health Malaysia.

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Disclosure

The authors report no conflicts of interest in this work.

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6.3 Summary

This RCT has successfully determined the significant positive impact of the video narratives on MUSE and several outcomes such as stroke knowledge, illness perception, treatment belief, BP self-monitoring, and BP control. However, its impact on patients' quality of life was not accomplished due to a high unfilled number of questionnaires. Apart from this, many potential post-stroke patients with atrial fibrillation were also not followed-up in the study. Though all patients with stroke were automatically subjected to an ECG, secondary prevention of ischemic stroke in the setting of atrial fibrillation is very different from ischemic stroke in the setting of normal sinus rhythm. Thus, these patients were referred to cardiovascular specialist clinic after a short appointment for review in the Neurology outpatient clinic. Nevertheless, the majority of findings supported the purposeful application of video narratives as a motivational trigger to assert the effect of patient education among post-stroke patients. Despite having limited cost and time, the researcher successfully attempted the intervention without much abruption in the clinic staffs' workload. However, this translational research of 'theory to practice' could not witness its full potential in sustaining behavioral changes related to MUSE. Thus, the effectiveness of the video narratives is only proven significant within this study population. Nevertheless, this endeavor has opened various research opportunities to explore affordable multimedia and patient education technologies to be personalized and accessed by individuals of various beliefs and motivations.

Chapter 7 will draw together the findings from all core chapters.

CHAPTER 7

This thesis aimed to evaluate the impact of video narratives on the self- efficacy of medication understanding and use among post-stroke patients. This chapter will summarize the key findings presented in the thesis.

7.1 Conclusion

Researchers have applied various strategies for patient education modules to enhance the medication-taking behavior of patients. Nonetheless, the base of behavioral modification was via the incorporation of theoretical behavioral constructs such as the Health Belief Model. This strategy was best to cater to post-stroke patients as it fits into the needs of illness perception and treatment beliefs of the particular patient population.

Post-stroke patients seek empathy, encouragement, and confidence to overcome various medication management challenges apart from emotional and physical life challenges. Self-efficacy of understanding and taking medication was the most common deficiency among those with poor recurrent stroke risk factor control. Motivational messages have an upper-hand towards changes in thoughts and actions. Hence, one emerging method to motivate post-stroke patients is through narratives, whereby peers or health professionals convey their personal experiences as motivational messages.

The audio-visual method was the best technique to deliver those messages. This approach was practical because it helped to trigger behavior changes among post-stroke patients within a short period. Therefore, it was an applicable method to ensure treatment adherence during the crucial period of the risk of stroke recurrences.

Findings from Chapters 5 and 6, has successfully shown that self-efficacy is a dynamic behavioral construct under constant change. The video narratives, which was culturally appropriate, managed to tap into patients' proactiveness and motivational levels. The intensity of this impact was reflected by significant changes in MUSE, BP self-monitoring, and BP control. But, belief and knowledge had an effect on these changes too. The intermittent video exposure would have also caused sustenance of the behavioral actions. Adding on, dropouts from both the feasibility study (10%) and RCT (22.7%) are potential limitations to this study; as one may argue that the patients who carried on with the study to completion were the ones who were more self-motivated, which accounted for the significantly better adherence and improved outcomes in the intervention group.

Nevertheless, despite these limitations, video narratives have emerged to be effective if personalized to specific cognitive and emotional needs of a patient population. The thesis findings have also noted that it was possible to incorporate video narratives as an additional effort to the standard care of post-stroke patients in the Neurology clinic. Apart from that, this study has indirectly discovered that MUSE has the potential to be a medication adherence outcome measure for post-stroke patients. Nevertheless, further validity and reliability study on MUSE is warranted.

7.2 Future implications

The findings presented in this thesis have added to the existing knowledge related to post-stroke patients. It has also highlighted several areas that need further exploration.

The development of an innovative technique that embeds patients' emotional well-being should be considered as a priority. Whereas, cultural beliefs differences in a multicultural society with the influence of religious belief would need deeper understanding in terms of feasibility and applicability of similar theoretical framework. These study findings stress that patient-educationist should reflect not only the outcome-based practice but also the values-based practice, which considers the person who has the disease and the condition of the disease. Comorbidities associated with stroke such as diabetes and cardiovascular disease and their contribution to the medicine burden should also be considered. Nevertheless, because of data, time, and sample size limitation, other external factors such asdisease severity, financial burden, social stigma, or family support was not included in our analysis. Therefore, these factors remain a new area of research for furtherexploration.

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Appendix 1: Ethics approval from the Medical Research and Ethics Committee

JAWATANKUASA ETIKA & PENYELIDIKAN PERUBATAN
(*Medical Research & Ethics Committee*)
KEMENTERIAN KESIHATAN MALAYSIA
d/a Institut Pengurusan Kesihatan
Jalan Rumah Sakit, Bangsar
59000 Kuala Lumpur

Tel.: 03-2287 4032/2282 0491/2282 9085
03-2282 9082/2282 1402/2282 1449
Faks: 03-2282 0015

Ruj.Kami:KKM/NIHSEC/ P15-893 (13)
Tarikh: 17-July-2018

DR JOYCE PAULINE A/P JOSEPH
HOSPITAL KUALA LUMPUR

MDM JAMUNARANI APPALASAMY
JEFFREY CHEAH SCHOOL OF MEDICINE AND HEALTH SCIENCES,MONASH UNIVERSITY - SUNWAY CAMPUS

Dato'/ Tuan/ Puan,

Annual Ethical Renewal for 2018

NMRR-15-851-24737 (IIR)
Protocol No :
A study of personalized intervention related to medication taking behaviour to reduce intentional medication non-adherence among stroke survivors

With reference to the 'Continuing Review Form' submitted 28-June-2018, we are pleased to inform that the conduct of the above study has been granted approval (via Expedited Review by Chairperson) for a year by the Medical Research & Ethics Comittee, Ministry of Health Malaysia. Please note that the approval is valid until 16-July-2019. To renew the approval, a completed 'Continuing Review Form' has to be submitted to MREC **within 1 month** before the expiry of the approval.

The MREC, Ministry of Health Malaysia operates in accordance to the International Harmonization Good Clinical Practice Guidelines.

Thank you

"BERKHIDMAT UNTUK NEGARA"

Saya yang menurut perintah,

(DR HJH SALINA ABDUL AZIZ)
Chairman
Medical Research & Ethics Committee
Ministry of Health Malaysia

HM/Annualrenewal2018/Mrecshare

Appendix 2: Ethics approval from the Monash University Human Research Ethics Committee

MONASH University

Monash University Human Research Ethics Committee

Confirmation of Registration

Project Number:	9640
Project Title:	A study of personalized intervention related to medication taking behaviour to reduce intentional medication non-adherence among stroke survivors
Chief Investigator:	Professor Anuar Zaini
Expiry Date:	12/06/2022

Terms:

1. Registration is valid whilst you hold a position at Monash University and approval at the primary HREC is current.
2. This notification does not constitute an HREC approval. It is the responsibility of the Chief Investigator to ensure that approval from the primary HREC continues for the duration of the research.
3. End of project: You should notify MUHREC at the conclusion of the project or if the project is discontinued before the expected date of completion.
4. Retention and storage of data: The Chief Investigator is responsible for the storage and retention of the original data pertaining to this project in accordance with the *Australian Code for the Responsible Conduct of Research*.

Thank you for your assistance.

Professor Nip Thomson

Chair, MUHREC

CC: Ms Jamuna Appalasamy

Appendix 3: Data collection form

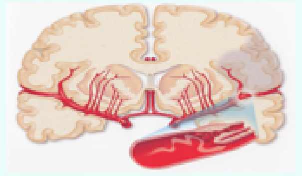
Data collection form					
ID			Date:		
Section 1:Patient Details and Demographics					
Name					
R/N No:					
NRIC:					
Address:					
Contact Number					
Age:					
Gender:	☐	Male	☐	Female	
Ethnic:	☐ Malay	☐ Chinese	☐ Indian	☐ Others	
Education level:	☐ Primary	☐ Secondary	☐ Tertiary	☐ Nil	
Health literacy (refer to NVS)	Score:				
Marital Status:	☐ Single	☐ Married	☐ Unknown		
Occupation:					
Section 2:Diagnosis					
☐ Ischaemic Stroke	☐ Transient Ischaemic Stroke	☐ Others			
TIA/Stroke event	☐ First	☐ Recurrent Number of previous stroke/TIA:			
Section 3: Baseline Vital Sign, Hematology, Other Lab results, Investigations (First outpatient follow-up after stroke or TIA/before study intervention)					
Height:	Weight:	BMI:			
BP:	PR:	SPO_2 %:			
Glucometer reading:	Fasting:	Non-fasting:			
Glasgow coma scale	Total:				
	☐ Severe	☐ Moderate	☐ Mild		
Hematology	Hemoglobin:	Creatinine:	Uric acid:		
	T.Cholestrol:	HDL:	LDL:		
	Triglyceride:	INR:	HbA1c:		
	Platelets:	Others,specify			
Electrolytes	Na+	K+	Mg+		
	Ca+	Others,specify			
Section 4:Risk Factors					
☐ None	☐ Hypertension Duration:	☐ Diabetes Duration:	☐ Smoker Duration: No. sticks/day:		
☐ Hyperlipidemia	☐ Alcohol	☐ IHD/Heart disease	☐ Atrial fibrillation		

☐ Hyperuricemia	☐ Pheripheral arterial disease	☐ Family history of stroke	☐ Oral contraceptive
Section 5: Stroke treatment		Date:	
Discharge medication/1st follow-up	☐ Yes	☐ No	☐ Unknown
Antiplatelet	☐ Aspirin Dose: ☐ 75mgOD ☐ 100mgOD ☐ 150mgOD ☐ 300mgOD Compliance: ☐ Yes ☐ No ☐ Unknown		
	☐ Ticlopidine ☐ Clopidogrel ☐ Dipyridamole ☐ Others,specify		
Anticoagulant	☐ Heparin ☐ LMWH ☐ Warfarin		
Insulin	☐ Short-acting ☐ Long-acting ☐ Intermediate-acting		
Gemfibrozil	☐ Yes	☐ No	
Supplement	☐ Yes Specify:	☐ No	
Complementary medicine	☐ Yes Specify:	☐ No	
Other OTC	☐ Yes Specify:	☐ No	
	Purchased on own ☐ Yes ☐ No	Prescribed (Doctor/Pharmacist) ☐ Yes ☐ No	
Ace Inhibitors			
ARB			
CCB			
Beta blockers			
Alpha Blockers			
Diuretics			
Statins			
Oral antidiabetics			
Others			
Medication Adherence Reasons Scale	Total score:		
	For those scored as non-compliant/ poor OR non-adherence 1)How long defaulted treatment? 2)Reason, specify:		
Adherence method	☐ Reminder Specify	☐ Pill box/check Specify	☐ Others, Specify
Section 6: Assessment			
MUSE Score			
BIPQ Score			
BMQ Score			

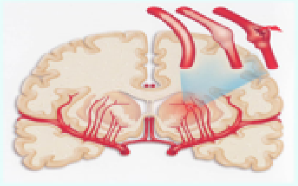
SKT score			
SF36 Score			
Rehabilitation referral	Yes	No	Unknown
MTAC/ Stroke education	Yes	No	Unknown
DFIT (teachback)	Yes	No	Unknown
Medication review	Yes	No	Unknown
Self-monitoring	Yes	No	Unknown
	Method:		
Neuropsychological test (memory and cognitive function)	Yes	No	Unknown
Depression status	Yes	No	Unknown
Section 7: Outcome of treatment at discharge/1st /2nd/3rd/4th follow up			
Stroke complication	Death	Hospitalized	

Appendix 4: Study brochures (samples)

What causes a stroke?



Ischemic stroke: blood clot blocks an artery serving the brain, disrupting blood supply. It is the end result of a buildup of cholesterol and other debris in the arteries (atherosclerosis) over many years.



Hemorrhagic stroke: A blood vessel in or around the brain bursts, causing a bleed or hemorrhage. Long-standing, untreated high blood pressure places a strain on the artery walls, increasing their risk of bursting and bleeding.

What is Transient Ischemic Attack (TIA)?

Sometimes called a 'mini stroke'. It occurs because of **temporary disruption of blood supply** to parts of the brain. The symptoms are very similar to a full stroke but unlike a full-blown stroke, the symptoms last under 24 hours and afterwards there is full recovery.

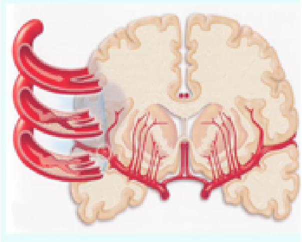
A TIA is an indication that part of the brain in not getting enough blood and that there is a risk of a stroke occurring. **A TIA should never be ignored** and should be reported to a medical professional as soon as possible.

'Brain damage affects your senses, your speech and understanding of language. One side of your body may be paralyzed, your behavior, thought and memory patterns are altered'.

STROKE

The brain is the nerve center of the body, controlling everything we do or think, as well as controlling automatic functions like breathing.

When a build-up of plaque forms in the artery, it blocks the blood flow, causing blood clots to form disrupting blood supply to the brain. That part of the brain starts to die. You have a stroke. **Very quickly. Very silently.**



Who is at risk?

1. ***Untreated high blood pressure (hypertension).*** This damages the walls of the arteries.
2. ***Diet.*** A diet high in salt is linked to high blood pressure, while a diet high in fatty, sugary foods is linked to furring and narrowing of the arteries.
3. ***Diabetes.*** Diabetes contributes to the building up of plaques inside the walls of arteries which eventually blocks the flow of blood and cause stroke.
4. ***A previous TIA.*** Around one in five people who have a first full stroke have had one or more previous TIAs.
5. ***Atrial fibrillation.*** This type of irregular heartbeat increases the risk of blood clots forming in the heart. The blood clot may break off and travel to an artery in the brain to cause a stroke.
6. ***Smoking.*** This has a number of adverse effects on the arteries linked to higher blood pressure.
7. ***Heavy drinking.*** Possibility to raise blood pressure to dangerously high levels and may trigger a blood vessel burst in the brain.

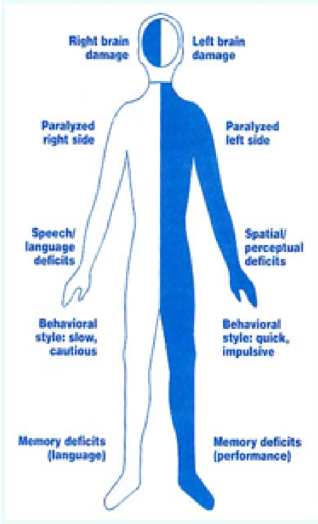
What are the symptoms?

Stroke does not just happen. Often, there are warning signs. By recognizing these signs and taking prompt action to get medical attention, you can avoid an impending stroke or reduce it severity.

- Sudden **weakness** or **numbness on one side of the body.** Signs of this may be a drooping face, a dribbling mouth, weakness in the arm or leg.
- Sudden **blurred vision** of one eye or both eyes.
- Difficulty in speaking or understanding speech, or **slurred speech**.
- Dizziness, loss of balance, **confusion**.
- Sudden severe **headache**.
- Nausea or vomiting.

What are the effects of stroke?

It vary from person to person, depending on which part of the brain is damaged and the extent of that damage. For some, the effects are relatively minor, others are left with more severe, long term disabilities.



Anda patut..

Meminta doktor/ahli farmasi anda menerangkan tentang

- fungsi ubat-ubatan itu dan **kenapa** anda patut mengambilnya.
- **Apakah** kesan baik dan kesan sampingan ubat
- **Bagaimanakah** mengambil dan menyimpan ubat-ubatan
- **Di manakah** anda boleh mendapatkan lebih banyak maklumat tentang ubat anda

Bagaimana ubat-ubatan boleh membantu.

Jika anda pernah mengalami strok, besar kemungkinan anda ada mengambil ubat-ubatan yang ditentukan oleh doktor anda untuk mengurangkan risiko strok berlaku lagi.

Ubat-ubat yang ditentukan adalah ubat untuk :

*** Mengawal tekanan darah**

*** Mengurangkan risiko gumpalan darah**

*** Mengurangkan tahap kolesterol 'tidak baik'**

*** Mengawal paras glukosa darah**

Adalah penting untuk anda mengambil ubat seperti yang ditentukan oleh doktor. Sesetengah orang berhenti mengambil ubat sebaik sahaja mereka merasa sihat – tanpa mengetahui bahawa mereka meletakkan diri sendiri dalam bahaya. **Minta nasihat dari doktor anda sebelum mengambil apa-apa ubatan.**

Apakah Yang Boleh Anda Lakukan Untuk Mengurangkan Risiko Strok berulang?

Mengamalkan gaya hidup sihat

Bagi mereka yang telah mengalami strok atau serangan iskemia sementara (TIA), sentiasa ada kebimbangan strok akan berlaku lagi. Walaupun risikonya lebih besar dari seseorang yang tidak pernah mengalami strok, anda boleh mengubahsuai gaya hidup anda untuk mengurangkan risiko strok berulang.

- **Jadilah lebih aktif secara fizikal dan mental.**
- **Amalkan diet yang sihat.**
- **Jangan merokok.**
- **Hadkan minuman beralkohol.**
- **Mematuhi pelan pemulihan.**
- **Mempelajari tentang komplikasi strok dan pencegahannya terutamanya untuk pneumonia aspirasi, jangkitan saluran kencing, sakit perut, pendarahan gastrousus, kemurungan.**

KENALI UBAT ANDA

Untuk mengurangkan tekan darah

Diuretik – membuang lebihan bendalir dan garam (sodium) dari tubuh.

Penghalang-beta – mengurangkan kadar degupan jantung dan pengeluaran darah dari jantung.

Pengembang saraf – ini boleh merehatkan otot pada dinding salur darah dan membolehkannya mengembang.

Penghalang enzim pengubah-angiotensin (ACE)&Penghalang penerima angiotensin II – mengganggu pengeluaran angiotensin tubuh, sejenis bahan kimia yang menyebabkan pengecutan arteri.

Antagonis kalsium – boleh mengurangkan kadar degupan jantung dan merehatkan saluran darah.

Untuk mengurangkan gumpalan darah

Anti-platelet e.g. aspirin & clopidogrel. Mengelakkan sel-sel darah yang dikenali sebagai platelet dari menggumpal untuk membentuk darah beku – yang boleh mengurangkan atau menghentikan sama sekali pengaliran darah ke bahagian otak dan menyebabkan strok.

Anti-penggumpal e.g. warfarin. menghalang protein-protein penggumpal, mencairkan darah dan mengurangkan kemungkinan pembentukan gumpalan.

Untuk mengurangkan paras kolestrol 'tidak baik'

Tahap kolesterol 'tidak baik' yang tinggi dalam darah meninggikan risiko strok. Jika perubahan diet tidak mengurangkan tahap kolesterol di dalam darah, doktor anda mungkin akan menentukan ubat merendahkan kolesterol yang direka untuk mengurangkan tahap lemak (lipid) di dalam darah, termasuk kolesterol dan trigliserida.

Jangan terlepas pemeriksaan doktor

Adalah penting untuk menjalani pemeriksaan kesihatan secara teratur supaya tekanan darah, tahap kolesterol, paras glukosa darah dan berat badan anda dapat diawasi. Semua jenis ubat-ubatan hanya boleh didapati dengan preskripsi ubat dari doktor.

Untuk maklumat lanjut, hubungi kami

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