Title

The development and validation of video narratives for aging patients with the risk of recurrent stroke.

Authors

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Abstract

Background and Objectives: 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 a plus-point to patient education efforts. However, its effect on medication understanding and use self-efficacy have not been tested. The researchers believed that culturally sensitive video narratives which catered specific niche would reveal a personalized impact on medication adherence. This study aimed to develop and validate video narratives for this purpose.

Methods: This study adapted Delphi method to develop a consensus on the video scripts contents of learning outcomes and HBM questions. The panel of experts consisted of eight members representing a mix of experiences in stroke in Malaysia. The Delphi method involved three rounds of discussion. Once consensus was achieved, the researchers drafted the initial scripts in English which were then back-translated to the Malay language. Ten bilingual patients within inclusion criteria screened the scripts for comprehension. Subsequently, an actual doctor and patient narrated the scripts while they were filmed; to add 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 analysis were applied to confirm the validity of the video narratives.

Results: Initially, the researchers proposed eight learning outcomes and nine HBM questions for the video scripts content. However, following Delphi rounds 1 to 3, few statements were
omitted and rephrased. Complete agreement (>80%) arrived for five learning outcomes and five HBM questions. Kendall’s coefficient of concordance, \( W \); was above 0.7 which indicated a firm agreement, and SD values within a range of below 1.5 confirmed satisfactory content and construct validity of learning outcomes and HBM questions. Also, the video engagement scores were above average which indicated that the video narratives had a good link with perceived realism.

Conclusion: The Delphi method was proven to be helpful in conducting discussion systematically and providing precise contents for the development of video narratives. Whereas, the video engagement scale had helped to create realistic video styles 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 warranted.

Keywords: Delphi method, medication understanding and use self-efficacy, stroke, video narratives, video engagement, Health Belief Model

Introduction

Medication nonadherence is prevalent at large especially among major chronic diseases, despite patient education advanced knowledge and methods [1]. Regardless, a definite health economic impact, current endeavors of patient education interventions still appear to be inadequate [2]. Stroke prevalence globally is not exempted from this medication nonadherence cliché [3]. A similar situation and increasing aging population among stroke 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 our hearing senses [6]. Hence, when a patient sees and hears a video, they have a higher probability of comprehending and reflecting the information [6]. Videos delivered via a televised format offers an advantage whereby the viewer; of any age group, would be able to digest the information in a relaxed environment or at a constant pace.

The researchers proposed a patient education intervention at the 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. The waiting area is a potential time 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 the internet facility or to those who depended on the external motivational environment such as peers.

The researchers believe that video narratives shown before patient education modules are expected to have a positive impact on self-efficacy. Also, if the video incorporated with theoretical behavioral constructs, could induce self-reflection, and simulation by a role model. Also, if the video is repetitively seen, a ‘persuasive power’ would be instilled whereby the individual’s perception influenced by prior 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 at 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 objectives realizable and might induce a patient’s confidence in justifying what was said, seen or heard on the video.

This study hypothesized that providing video narratives incorporated with theoretical behavioral constructs adjunct to the existing MTAC patient education effort; informational brochures, counseling, and medication review would result in better stroke awareness and medication understanding and use self-efficacy toward improved adherence. This study is the intervention development and validation phase of a randomized controlled trial; MyStrokeStory [10].

Ethics approval

Approvals have been obtained from the Malaysian Medical Research and Ethics Committee – MREC (NMRR ID-15-851-24737) and the Monash University Human Research Ethics Committee - MREC (ID 9640), whereas MyStrokeStory trial was registered with the Australian New Zealand Clinical Trials Registry- ANZCTR (ACTRN12618000174280) with Universal Trial Number (UTN) U1111-1201-3955.

Methods

The Delphi method originated from RAND Corporation studies from 1950’s aimed to develop a reliable technique to obtain consensus from experts. Since then, many researchers have applied this organised 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 consensus which took place between October 2017 and December 2017 and maintained the anonymity of experts in the field of the stroke on content objectives of video narrative scripts [11]. The consensus procedure incorporated three 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 of feelings of being independent to lead a quality of life, reducing the severity and prevent recurrent stroke [13-16]. To be able to achieve these aim, the patient would utmostly require confidence and self-efficacy. Moreover, the initial objectives had to be in line with the MTAC’s policy and the recurrent stroke preventative treatment and management guideline of Malaysia's stroke education learning outcomes [14,15].

Fundamentally, the design of the content was based on a most widely used framework; Health Belief Model (HBM) [17]. HBM has outlined few health behavior constructs that guide a patient’s decision making; perception of the risk contracting the illness and how the 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 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’.

The core of the Delphi method was the selection of experienced expert members within the specific need of the content development. Therefore, the researchers invited the members of
the stroke community and healthcare professionals whom then gave consent after a brief explanation by the researchers.

The expert panel team consisted of two neurologists (SSR and JPJ), two pharmacists (PS and AS), two medical educationists (RV and TKK) and two-stroke experienced patients (AT and LM). The neurologists were selected based on their 10 to 12 years professional qualification of diagnosing and prescribing medications to patients with stroke. The pharmacists were also selected based on their 10 to 12 years professional qualification of medication review and dispensing 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 five years had experiences and awareness of the need and emotional support to enhance self-efficacy.

All members were homogenous of a specific niche for the content development as each of them were bilingual, had relevant knowledge about stroke, 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 up to three rounds of discussion.

Delphi method; Round 1

The researchers drafted the initial narrative scripts content guide from literature findings, which consisted of eight learning outcomes and nine HBM related questions linked to individual perception, cues to action, the likelihood of action and self-efficacy. The panel of experts was given options; (i.e., yes: to agree to accept or no: do not agree to accept) and an open-ended question to add any other relevant information into the list or justify any redundancy. Hence, this round helped for the content and construct validity of the list, clarification of meaning and rephrasing or merging of a redundant statement. They were given three weeks’ timeline to respond to the Delphi method coordinator; (JRA).

It is acceptable that an 80 % agreement from the panel (i.e., 6 of 8 experts) of response frequencies for each learning outcomes and HBM questions to be accepted or omitted. This percentage cut off was an appropriate reference point to attain content and construct validity [18]. Hence, the researchers removed those statements which were not meeting 80 % agreement whereas the rest of statements and HBM questions were modified, rephrased or merged based on experts’ feedback and then were re-listed in a survey questionnaire form and emailed to the experts for Delphi method, Round 2.

Delphi method, Round 2

The researchers repeated the same procedure 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 (i.e., 1: not at all relevant, 7: extremely relevant). They were asked to justify their choice rank if it was 4-points and lower. Kendall’s W coefficient of concordance was used to measure the non-parametric rankings [19] for a better affirmation of content and construct validity. According to Kendall, the W value ranges from 0 – 1 (i.e., 0: no consensus, 1: full consensus) with 0.7 and greater indicated strong agreement so that specific weaker agreement could be scrutinized and relooked to avoid bias and force agreement. Besides, a standard deviation of below 1.5 was also considered to add value to the consensus compared to a percentile of agreement [20].
The coordinator received comments and feedback to rephrase 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’s discussion.

Delphi method, Round 3

Round 2 discussion and analysis produced a summary of responses and clarification from the panel of experts which give an overall picture of final scoring and 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. W and SD value were then re-calculated, and subsequently, a full-detailed report of the discussion sent to all expert members.

The development of the video narrative scripts

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

Face validity of the video narrative scripts

A purposeful sample of 10 bilingual patients with stroke (within the inclusion and exclusion criteria of the trial [10] were requested to provide written feedback on the comprehension of the English and Malay video narrative scripts. The patients were either asked to reply via email or prepaid postal service.

The development of the video narratives

The researchers believed that it was ideal and realistic to have actual actors (i.e., neurologist and a patient who had experienced stroke) to narrate the scripts meanwhile the video was taken at the Arts and Social Sciences School, Monash University, Malaysia by the help of a technical officer (HB). They narrated each video scripts within two minutes, 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 expression showcasing appropriate emotion. The researchers also highlighted the videos with written captions and subtitles with readability level six [21]. Free-lance video designer; (KHS), edited the videos using Movavi video editor 14; a video editing software compatible with Windows 10 Home and accompanying Vibra 5 stereo headset with a microphone by SonicGear, Malaysia. We repeatedly edited the videos after several rounds of comments on visual and sound clarity and presentation style.

The validity of video narratives: video engagement level
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 [23]. Therefore, the researchers adopted the Video Engagement Scale (VES) to obtain feedback on the ecological validity of the video narratives [24]. 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; external validity of video vignettes [24]. However, VES was developed based on videos with multiple cases and shots, so the panel expert members and researchers selected only questions related to video narratives which related to emotion and motivation.

A purposeful sample of 10 bilingual patients with stroke (within the inclusion and exclusion criteria [10] viewed the video narratives and responded to the VES after being presented to them face-to-face during their follow-up clinic visit.

**Results**

We, the researchers made no addition to the initial draft of the learning outcomes and HBM questions prior Delphi method, Round 1. We omitted statements that were redundant; less than 80% agreement (i.e., What is a stroke? How serious is having a stroke?) or rephrased (i.e., How common is a stroke? to Who is at high risk of stroke?). Whereas, few other statements or questions had an only minor correction. Therefore, eight learning outcomes and nine HBM questions were edited to six statements six questions each for the Delphi method, Round 2.

In Round 2, the W value was slightly below 0.7. The mean ranking for learning outcomes and HBM questions were also varied (i.e., two experts were asked to justify their low score for learning outcome and HBM questions 1 and 2).

However, in Round 3, the list of learning outcomes and HBM questions was finalized (Table 1). Kendall's coefficient of concordance, W; above 0.7 indicated a firm agreement, and SD values within a range of below 1.5 confirmed satisfactory content and construct validity of learning outcomes and HBM questions. We expected occurrences of revision in every round of iteration. Therefore test-retest was not applicable to the Delphi method. However, a reliability test was computed independently for Round 3, whereby Cronbach’s alpha was 0.96 which indicated good internal consistency; items on the finalized learning outcomes and HBM questions were developed on the similar idea or construct (Table 2).

Table 1: The evolution of video narrative scripts’ learning outcomes and HBM questions parallel with HBM constructs
### Learning outcomes

**Round 1**
1. To understand the causes of stroke
2. To be able to recognize and understand stroke symptoms and effects.
3. To understand the prevalence and incidence of stroke in Malaysia

**Round 2**
1. To understand the causes of stroke
2. To be able to recognize and understand stroke symptoms and effects.
3. To understand the prevalence and incidence of stroke in Malaysia

**Round 3**
1. To be able to recognize and understand stroke cause, symptoms and effects.
2. To understand the burden of stroke

<table>
<thead>
<tr>
<th>Learning outcomes</th>
<th>HBM construct</th>
<th>HBM questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round 1</td>
<td>(Individual perception)</td>
<td></td>
</tr>
<tr>
<td>4) To understand the common risk factors of stroke</td>
<td>Perceived Susceptibility</td>
<td></td>
</tr>
<tr>
<td>5) To understand what lifestyle modification is needed to prevent another stroke</td>
<td>Perceived severity</td>
<td></td>
</tr>
<tr>
<td>6) To understand why it is important to adhere to medications.</td>
<td>Perceived threat</td>
<td></td>
</tr>
<tr>
<td>Round 2</td>
<td>Perceived benefit</td>
<td></td>
</tr>
<tr>
<td>4) To understand the common risk factors of stroke</td>
<td>Likelihood of action:</td>
<td></td>
</tr>
<tr>
<td>Round 3</td>
<td>Perceived barrier</td>
<td></td>
</tr>
<tr>
<td>1) What is stroke?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) How serious is having a stroke?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) How does a stroke affect the brain?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) What happens to you when you have a stroke?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) How common is stroke?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) How does a stroke affect the brain?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) What happens to you when you have a stroke?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Who is at high risk of stroke?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning outcomes</td>
<td>HBM construct</td>
<td>HBM questions</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Round 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) To acquire skills and information to be more self-efficacious in medication understanding and use</td>
<td></td>
<td>8) How long does it take for a person to recover from a stroke?</td>
</tr>
<tr>
<td>8) To understand the recovery period of stroke and importance of rehabilitation.</td>
<td>(Self-Efficacy)</td>
<td>9) How do we recover from stroke?</td>
</tr>
<tr>
<td>Round 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) To understand importance of medication understanding and use self-efficacy after a stroke</td>
<td></td>
<td>6) How do we recover from stroke?</td>
</tr>
<tr>
<td>Round 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) To understand and acquire skills of medication understanding and use self-efficacy after a stroke</td>
<td></td>
<td>5) How do you ensure your medication works for you?</td>
</tr>
</tbody>
</table>

Table 2: Final analysis of Delphi method, Round 3.

<table>
<thead>
<tr>
<th>Learning outcome</th>
<th>Mean Rank</th>
<th>Std. Deviation (SD)</th>
<th>Cronbach's Alpha if Item Deleted</th>
<th>Cronbach's Alpha</th>
<th>Kendall's W&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>learning outcome 1</td>
<td>4.1250</td>
<td>0.83452</td>
<td>0.959</td>
<td></td>
<td></td>
</tr>
<tr>
<td>learning outcome 2</td>
<td>3.8750</td>
<td>1.35620</td>
<td>0.963</td>
<td></td>
<td></td>
</tr>
<tr>
<td>learning outcome 3</td>
<td>4.8750</td>
<td>0.99103</td>
<td>0.959</td>
<td></td>
<td></td>
</tr>
<tr>
<td>learning outcome 4</td>
<td>5.3750</td>
<td>0.91613</td>
<td>0.954</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
learning outcome 5 | 5.3750 | 0.91613 | 0.954 | 0.961 | 0.714
HBM question 1 | 4.2500 | 1.03510 | 0.956 |
HBM question 2 | 4.0000 | 1.51186 | 0.961 |
HBM question 3 | 4.8750 | 0.99103 | 0.959 |
HBM question 4 | 5.3750 | 0.91613 | 0.954 |
HBM question 5 | 5.3750 | 0.91613 | 0.954 |

a. Kendall's Coefficient of Concordance

The researchers received positive feedback on the scripts (i.e., good script, short and meaningful, 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. Furthermore, VES scores were above average which exhibited good link with perceived realism (Table 3). Out of 10 patients, more than 80% of them strongly agreed on the emotional and motivational aspects of the video narratives.

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

<table>
<thead>
<tr>
<th>VES score</th>
<th>Completely disagree</th>
<th>Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 Total (n)</td>
<td></td>
</tr>
<tr>
<td>During viewing I was fully concentrated on the video</td>
<td>2 3 5 10</td>
<td></td>
</tr>
<tr>
<td>I empathized with the video character</td>
<td>1 1 4 4 10</td>
<td></td>
</tr>
<tr>
<td>The video affected me</td>
<td>1 5 4 10</td>
<td></td>
</tr>
<tr>
<td>I felt for the video character</td>
<td>1 4 5 10</td>
<td></td>
</tr>
<tr>
<td>I had the feeling I went through what the [video character] went through</td>
<td>4 3 3 10</td>
<td></td>
</tr>
<tr>
<td>Because of the video, feelings arose in me</td>
<td>1 1 5 3 10</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

This study explicitly developed video narratives for a randomized controlled trial [10]; whereby the researchers would be able to monitor the repetitive effect of narration from a doctor and a patient with stroke on medication understanding and use self-efficacy of patients who had experienced stroke. Different scripts and actors would cause gender and reflection biases. Thence, the scripts were a general reflection of recurrent stroke and its underlying comorbidities management with a mix of motivation and advice which hoped to trigger a sense of self-efficacy to understand and use prescribed medication among patients with stroke. The video narratives had undergone rigorous processes (i.e., development of script guidelines as in learning outcomes and HBM questions, bilingual scripts 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). 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. Video narratives have the persuasive strength for behavior modification especially if it is culturally sensitive and embedded with role model effect. Actual actors, good scripts’ constructs, appropriate language, and video presentation style play a part in delivering an impactful source in a behavioral intervention.

There were some apparent limitations occurred in this video narratives’ development. Face to face discussion was unable to be carried out in the Delphi method rounds, due to the lag 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 felt that face validity, and video engagement responses lacked the number of participation of patients with stroke because of specific inclusion and exclusion criteria via purposive sampling method. Therefore, the video narratives’ validation and study aim were skewed towards particular samples only and could not be generalized to the whole population with stroke. Also, responses from patients who were not -bilingual were also not assessed due to the delay during the purposive sampling period and having VES available in the English version only.

Nevertheless, the Delphi method was proven to be a versatile and helpful technique in conducting discussion systematically and reaching consensus unanimously; eliciting precise ideas and providing rich, in-depth data in defining an intervention strategy. As well, the video narratives development processes were found to be useful as a guideline for other behavioral studies using video as their intervention, samples with chronic illness and study sites other than healthcare 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 (i.e., realism, empathy and awareness); however, we believed that bigger samples would produce far more significant data. The researchers recommend if VES could be summarized and translated in various languages in the future to test its effectiveness in distinguishing video engagement style of multi-cultures. 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.

Competing interests

The authors declare they have no competing interests.

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