

Growth and Efficiency Testing a Portable Health Education Kit to Prevent Strokes in Stroke Survivors

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1. Abstract

1.1. Background: Drawing on social cognitive theory to address stroke survivors' low literacy, utilizing popular mobile health (m-health) gadgets can be a useful intervention strategy to lower the risk of recurrent strokes. The development and evaluation of an m-health based educational package for stroke survivors' prevention was the main goal of this study.

1.2. Method: This was a multimodal methodology that included pre-test and post-test design, as well as content development and efficacy testing utilizing the Delphi procedure. A physiotherapist took on a new role by teaching people about stroke prevention. The development process included drafting a script, translating it, and recording it into instructional audio and video packages. It also involved rating and retaining the items. Thirty consecutively allocated SSVs from each of the two intervention groups—audio (AIG) and video (VIG)—were used in the effectiveness test. Stroke literacy was measured at the beginning, the middle, and the end of the intervention. Descriptive and inferential statistics were used to summarize the data at $p < 0.05$ Alpha value.

1.3. Results: The majority of participants (63.3%) were men, (51.7%) were over 60, (83.3%) had hypertension, and (31.7%) had completed postsecondary education. Between AIG and VIG, knowledge of stroke

risk factors increased from baseline (11.23 ± 4.01 and 10.07 ± 3.24) to the second and fourth weeks (17.73 ± 0.78 and 15.30 ± 1.78 and 16.77 ± 1.01) after the intervention, respectively. The two groups differed significantly from one another ($p < 0.01$).

1.4. Conclusion: Social cognition theory-based mobile health education is an effective way to increase stroke literacy among SSVs, and it ought to be explored with larger community samples.

Keywords: Stroke prevention; Recurrent stroke; Mobile health

2. INTRODUCTION

Stroke presents a significant global issue to medical professionals, particularly rehabilitation specialists, due to its high incidence, death, disability rates, and expenses. Globally, there were 10.3 million first-ever strokes, 6.5 million stroke fatalities, and 25.7 million stroke survivors (SSVs) [1]. With 4.85 million stroke deaths in 2013 compared to 1.6 million in high-income countries (HIC), low- and middle-income countries (LMIC) had the largest burden of stroke [1]. Similarly, there were 91.4 million disability adjusted life years (DALYs) in LMICs compared to 21.5 million in HICs. When compared to LMICs, where resources for these strategies are scarce, HICs with access to high-quality healthcare and efficient stroke preventive and care strategies are linked to improved outcomes [1]. Unrecognized vascular risk factors, such as hypertension, are more common in SSVs and diabetes, compared to people who had never experienced a stroke before [2]. Thus, repeated strokes are associated with higher morbidity and death as compared to first strokes [3]. By changing vascular risk factors with medication and behavioral therapies, up to 80% of vascular events that reoccur after a stroke can be avoided [4].

Up to 50% of stroke survivors face the high prevalence of stroke recurrence and the resulting physical and cognitive deficits, which have detrimental effects on their social and economic standing [5]. Despite this, even after experiencing a stroke, SSVs and their family members lack adequate stroke education [6,7]. Since SSVs and their families have a real fear of stroke recurrence, prevention and health promotion initiatives for stroke must come first [8]. For this reason, it is crucial to focus educational initiatives for stroke prevention on SSVs as a population. Previously, stroke literacy was described as understanding the signs and risks of stroke. variables, while increasing stroke literacy on its own is insufficient to lower the risk of subsequent strokes, is a crucial part of lowering the risk of recurrent strokes [9, 10]. The main objective of stroke education is prevention, and 80% of the time, strokes can be avoided by giving appropriate information about the symptoms of a stroke [11].

As a result, recommendations for managing strokes state that one of the main objectives of stroke therapy is secondary prevention of stroke [12], and there are further guidelines for preventing recurrent stroke [3]. It is common for modifiable risk variables to go unmanaged following a transient ischemic attack or stroke [1]. Research indicates that modifying patient education or behavior alone, without altering the way care is delivered, such as by redefining professional roles and collaborating across disciplines, did not significantly alter the clinical risk factors for stroke [13]. Nonetheless, modifications to the way healthcare services are organized were associated with meaningful improvements in blood pressure and body mass index.

3. MATERIALS AND METHODS

This multimodal approach consisted of two stages of Delphi is used for content creation and efficacy testing, protocol, and the design of the pre- and post-tests, correspondingly.

3.1. Development Phase

A desk assessment of the techniques and recommendations used in earlier research on stroke education was conducted, and items from pertinent studies [23, 25] were chosen based on their applicability to the Nigerian setting. A total of 78 subjects and 13 domains were chosen to create the educational package's material. Medical knowledge, risk factors, medication-assisted treatment, surgical treatment, treatment with herbal or alternative medicine, rehabilitation, healthy lifestyle promotion, food habits, preventive strategy, specific problems, coping mechanisms, other topics, and the significance of outpatient clinic follow-up are among the domains covered. After that, five professionals who specialize in stroke therapy were asked to participate in the content validity survey. Among them were one occupational therapist, two physiotherapists, and two neurologists. It is advised that two to three professionals evaluate an instrument.

3.2. Effectiveness Testing Phase

The AVm Health teaching package underwent four weeks of pilot testing, divided into three stages: the pre-intervention phase, the initial post-intervention phase, and the last stage following an intervention.

3.3. Participants

The stroke (SSVs) that participated in this study were purposefully selected from the physiotherapy and neurology outpatient clinics of the state hospital Asubiaro (SHA), Osogbo, Obafemi Awolowo University Teaching Hospital (OAUTH), Ile-Ife, and Uniosun Teaching Hospital (UTH), Osogbo in Osun state, Nigeria. Stroke survivors who can read and/or understand the stroke literacy questionnaire and the Short Portable Mental Status questionnaire (SPMSQ) and who do not have cognitive impairment (scores of 2 or less on the SPMSQ) were included in the study; SSVs who scored more than 2 on the SPMSQ, those who are hospitalized, or those who have dementia or active psychiatric illness were excluded. Two groups of participants were formed: the audio intervention group (AIG) and the video intervention group (VIG).

3.4. Sample Size Calculation

A common rule of thumb for the large enough sample condition— $n \geq 30$, where n is the sample size—was used to calculate the sample size. This is predicated on the central limit theorem, which predicts that the distribution will be about normal if the sample size is sufficiently big. It happens that $n \geq 30$ is the general rule [27]. Thirty stroke survivors per group, AIG and VIG, were recruited, as advised.

3.5. Data Analysis

Demographic and clinical features were described using descriptive statistics, which employed mean, standard deviation, frequency, and percentages. In order to examine stroke literacy within the group at baseline, two weeks, and four weeks after the intervention, repeated measure ANOVA was utilized; for comparisons between groups, mixed method ANOVA was employed. $P < 0.05$ was used as the alpha value. Version 22 of the Statistical Package for Social Sciences (SPSS) was used to analyze the data.

4. RESULTS

4.1. Development of the Educational Package

With adherence to the Delphi principles and a consensus-based method involving item selection, retention, and rejection from stroke rehabilitation experts, the educational materials for stroke prevention among stroke survivors (SSVs) were effectively designed. To create the instructional package, 59 items and 11 domains were kept from the initial selection of 78 themes and 13 domains.

4.2. Effectiveness-Testing of the Educational Package

Participant sociodemographic characteristics: Sixty SSVs in all, evenly and successively assigned to AIG and VIG, took part in the efficacy test of this instructional package. The majority (63.3%) were men, (51.7%) were older than 60, and (31.7%) had postsecondary education. The subjects' specific clinical and sociodemographic information is provided.

5. DISCUSSION

Health providers must understand how critical it is to address the educational requirements of stroke survivors and disseminate information on all facets of the condition. Videos, manuals, and contemporary technology are just a few of the informational tools that must be used to educate SSVs and their caretakers [23]. An instructional package on mobile health (AVm Health) with an audio-visual component was created in this study to help stroke survivors prevent strokes. It is anticipated that by increasing stroke literacy among this population—particularly in Nigeria and other LMICs where stroke survivors lack knowledge of stroke, its risk factors, and warning signs—knowledge of stroke risk factors will significantly contribute to secondary stroke prevention [7,30,31]. This instructional tool's contents align with the topics identified in the Maniva et al. study [14]. Experts in stroke rehabilitation validated the instrument, which is in line with other research that created a new tool and evaluated its items for content validity [32, 33]. A multidisciplinary team led by

a physiotherapist developed and started the creation of the AV mHealth educational package for this project. This supports Joel et al.'s [13] advice to redefine professional roles and collaborate with multidisciplinary teams, as there is proof of significant results. It was a more convenient way for participants to receive interesting content—mobile phones. Social cognitive theory, which is more patient-centered, served as the foundation for the intervention.

6. CONCLUSION

A multimedia-based curriculum for mHealth education in native the language of Yoruba was created. The tool is helpful, simple to use, and effective in raising stroke survivors' literacy levels. It may also be good in preventing subsequent strokes. It is recommended that the tool be evaluated with a larger sample size in various community situations.

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