Effects of Falls Prevention Education on Related Knowledge Gain and Behaviour Changes among Older Adults

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ABSTRACT

Background of study: Falls prevention education (FPE) was found to be effective in addressing falls among community dwelling older adults. However, the information on the effectiveness of FPE on its related knowledge gain and behaviour changes among older adults is limited. The aim of this study was to examine the effectiveness of FPE using booklet versus video among community dwelling older adults on related knowledge gain and behaviour changes.
Methods: Fifty-two participants participated in this study, who were equally divided into two groups. Group 1 (n=26, 65.46±4.88 and 2 (n=26, 66.9±5.25) received FPE delivered using booklet and video respectively. The Falls Risk Awareness Questionnaire (FRAQ) and Falls Behavioural (FaB) Scale were the outcome measures used to measure related knowledge gain and behaviour changes respectively at baseline (week-0) and post intervention (week-4). Data was analysed using analysis of covariance to compare within-and-between subject effect.
Result: No significant differences were found at baseline between groups except for FRAQ score There was a significant between group effect on FRAQ and FaB scores ($p<0.05$). Greater knowledge gain (3.7%) was demonstrated in older adults who received falls prevention education via video compared to booklet (2%). However, older adults in the booklet group had a positive behaviour change pertaining falls prevention.
Conclusion: There may be a possibility of achieving maximum falls related knowledge gain and favourable behaviour changes in older adults by combining both methods.

Keywords: Falls prevention education; Knowledge gain; Behaviour; Elderly; Older adult

ABSTRAK

Latar belakang kajian: Pendidikan pencegahan jatuh (FPE) didapati berkesan dalam menangani insiden jatuh dalam kalangan warga emas. Walau bagaimanapun, maklumat mengenai keberkesanan FPE dalam peningkatan pengetahuan dan perubahan tingkah laku dalam kalangan warga emas adalah terhad. Tujuan kajian ini adalah untuk mengkaji keberkesanan FPE menggunakan buku kecil berbanding video dalam kalangan warga emas untuk peningkatan pengetahuan dan perubahan tingkah laku.
Kaedah: Lima puluh dua peserta mengambil bahagian dalam kajian ini, yang dibahagikan kepada dua kumpulan secara sama rata. Kumpulan 1 ($n = 26$, 65.46 ± 4.88 dan 2 ($n = 26$, 66.9 ± 5.25) menerima FPE menggunakan buku kecil dan video masing-masing. Soal selidik Kesedaran Risiko Kejatuhan (FRAQ) dan Skala Tingkah Laku Kejatuhan (FaB) adalah pengukuran yang digunakan untuk mengukur peningkatan pengetahuan dan perubahan tingkah laku masing-masing pada peringkat awal (minggu-0) dan selepas intervensi (minggu ke-4). Data dianalisis menggunakan analisis kovarians untuk membandingkan kesan dalam dan antara subjek.
Hasil: Tiada perbezaan signifikan pada peringkat awal antara kumpulan kecuali skor FRAQ. Terdapat kesan yang signifikan antara kumpulan terhadap skor FRAQ dan FaB ($p <0.05$). Peningkatan pengetahuan yang lebih besar (3.7%) ditunjukkan pada warga emas yang mendapat pendidikan pencegahan jatuh melalui video berbanding buku kecil (2%). Walau bagaimanapun, warga emas dalam kumpulan buku kecil mengalami perubahan tingkah laku positif mengenai pencegahan jatuh.
Kesimpulan: Terdapat kemungkinan untuk mencapai peningkatan pengetahuan dan perubahan tingkah laku yang maksimum dalam kalangan warga emas dengan penggabungan kedua-dua kaedah ini.

Kata kunci: Pendidikan pencegahan jatuh; Peningkatan pengetahuan; Tingkah laku, Warga emas.

INTRODUCTION

A fall is defined as "an unintentional incidence which causes in a person coming to rest inadvertently on the floor or ground, which results in injuries and disabilities" (WHO 2018). Falls among ageing population is a major public health concern globally (Gillespie et al. 2012). It is the second leading cause of accidental injuries relating to death among older adults worldwide (NICE 2013). The healthcare cost for the management of falls related injuries among older adults is expected to increase parallel to the increase in ageing population (Florence et al. 2018). In addition, decline in physical activity due to fear of falls, anxiety and loss of self-confidence may result in functional dependency among older adults (Choi et al. 2017).

Community dwelling older adults were reported to have average knowledge level and positive perception towards falls prevention strategies (Gamage et al. 2018). Moreover, older adults who perceived falls prevention to be vital were more likely to participate in falls prevention practice in their activities of daily living (Laing et al. 2011). An association may exist between falls prevention knowledge and its prevention behavior among older adults (Laing et al. 2011). Falls prevention behavior is referred to the practice to avoid falls in daily activities (Uymaz & Nahcivan 2015) which includes moving carefully, using walking aids and getting help to perform certain activities of daily living (Hill et al. 2011; Pohl et al. 2015). Notably, falls prevention behavior among older adults is still inadequate (Laing et al. 2011).

Falls prevention education (FPE) has been highlighted in most falls prevention guidelines including in NICE (2015, updated 2017) as one of the components of multifactorial falls prevention intervention. The recommendation is that it should be packaged to include all aspects of falls such as its consequences, risks and prevention approaches. In a pilot RCT study by Hill et al. (2013), it was shown that specifically tailored falls prevention education delivered using multimedia were more likely to facilitate and engage older adults in falls prevention practices. As a result, improved knowledge, confidence level and motivation in regard to falls prevention behaviour.

Although FPE has been shown to have encouraging outcomes, its focus has been on decreasing number of falls and injuries (Ang et al. 2011; Cumming et al. 2008). There is limited information on effective methods of delivering FPE to older adults especially on its knowledge gain and prevention behaviours. Hence, the aim of this study was to compare the effectiveness of falls prevention education delivered using booklet versus video presentation on its knowledge gain and behaviour changes. We hypothesised that falls prevention education conveyed via video approach was more effective in increasing falls prevention knowledge and facilitating behavioural change in community-dwelling older adults.

METHODS

This is a quasi-experimental study with pre- and post-tests. This study was approved by the Secretariat for Research and Ethics of Universiti Kebangsaan Malaysia (UKM /NN-159-2013).

Participants (N=52) were healthy community dwelling from two senior citizen's clubs (center A; n=26 & center B; n=26) in Kuala Lumpur, Malaysia. The sample size was calculated by using G-power 3.0.10. (Faul et al. 2007). These older adults were randomly selected from the available name list at the senior citizens' club and invited to participate in the study by phone calls. The inclusion criteria were older adults aged 60 and above, ambulating independently with or without assistive devices and able to read and communicate in Malay language. Older adults with depression (GDS≥10), with history of moderate to severe cognitive impairment and who had received similar falls prevention education previously were excluded.

Procedure

A booklet was designed in a simple and reader-friendly format with 14 point fonts, which were printed on off-white paper in order to allow a greater ease of reading for older adults. The video presentation was created based on the general principles of multimedia design and delivery from a previous study (Schepens et al. 2011). In our study, the contents of FPE provided in the booklet and video were similar. The contents of these falls prevention education included falls related facts, its risk factors, prevention strategies and coping strategies after a fall.

Participants were provided written and verbal information regarding the study and their informed written consent was obtained. Participants' socio-demographic data was obtained and they completed Fall Risk Awareness Questionnaire (FRAQ) version 3.0 and Fall Behaviour (FaB) Scale. Both these questionnaires were translated to Malay language with original author permission. Participants were then provided falls prevention education using either video (center A) or booklet (center B). The falls prevention education was provided by a final year physiotherapy undergraduate and it lasted for an hour, which included a Q and A session. Participants were not allowed to take home the video or booklet. At the fourth week after the education session participants were re-assessed using the Fall Risk Awareness Questionnaire (FRAQ) version 3.0 and Fall Behaviour (FaB) Scale.

Outcome Measures

Fall Risk Awareness Questionnaire (FRAQ) version 3.0 (Sadowski et al. 2006)

FRAQ assesses the knowledge and perception of falls risk in older adults. The questionnaire is structured into 3 sections. The first section contains 22 multiple-choice closed-ended questions which included the aspects of environment, behavior, medicine and medical health. The second section contains 11 questions that acquire participant's demographic data. The last section comprises of an open-ended question to be completed by researcher to provide the feedback regarding the suitability of the contents used in the questionnaire FRAQ was found to have an acceptable level of construct validity and reasonable test-retest reliability (Sadowski et al. 2006). The final score of the questionnaire was quantified based on the proportion of number of correctly answered question (X) in the first section. The higher the scores, the greater the knowledge level.

$$\left(\frac{X}{22} \times 100\right)\%$$

A forward and backward translation of the English version FRAQ was performed to produce a Malay version with the permission from the FRAQ authors. The internal consistency of this Malay version of FRAQ had a Cronbach's alpha value of >0.7 and this was considered to be acceptable.

Fall Behavioral Scale (FaB) (Clemson et al. 2003)

FaB is a subjective self-rating scale to identify fall risk awareness and fall prevention behavior among older adults. FaB is made up of 10 categories with 30 items. The categories are cognitive adaptations (6 items), protective mobility (5 items), avoidance (5 items), awareness (4 items), pace (2 items), practical strategies (3 items), displacing activities (1 item), being observant (1 item), changes in level (2 items) and getting to phone (1 item). Each item in the FaB is scored on a 4-point scale: Never (=1), Sometimes (=2), Often (=3), Always (=4) and doesn't apply (no score). The score ranges from 30 to 120, in which higher scores indicate safe fall prevention behaviour and lower scores indicate a risky behaviour. The scale was shown to be reliable with an internal consistency of 0.84 using Cronbach alpha and test-retest reliability of intra-class correlation coefficients (ICC) 0.94. A forward and backward translation of the English version FAB to a Malay version was done. Permission to do so was obtained from the FAB authors. The internal consistency of Malay translated FAB was examined and its internal consistency was acceptable with a Cronbach's alpha value of >0.7 after removal of 2 items.

Statistical Analysis

Data was analysed using Statistical Package for the Social Sciences (SPSS) version 20.0 (IBM Corp, Armonk, NY, USA). Sociodemographic characteristics data was analysed using descriptive data. Kolmogorove-smirnov tests confirmed all continuous variables were normally distributed. Analysis of covariate (ANCOVA) was used to compare baseline characterises of the participants and the changes of FRAQ and FaB, scores by group for the pre-post test scores. The percentage of difference in the scores of FRAQ and FaB between pre and post-tests were calculated. The statistical probability level was set at $p<0.05$.

RESULTS

A total of 52 participants completed the study without any drop outs. Total participants and the study flow were as shown in Figure 1. Participants'

baseline characteristics in each group are as summarized in Table 1. Statistical analyses showed that the groups were comparable at baseline in terms of age, gender ratio and education levels (p>0.05).

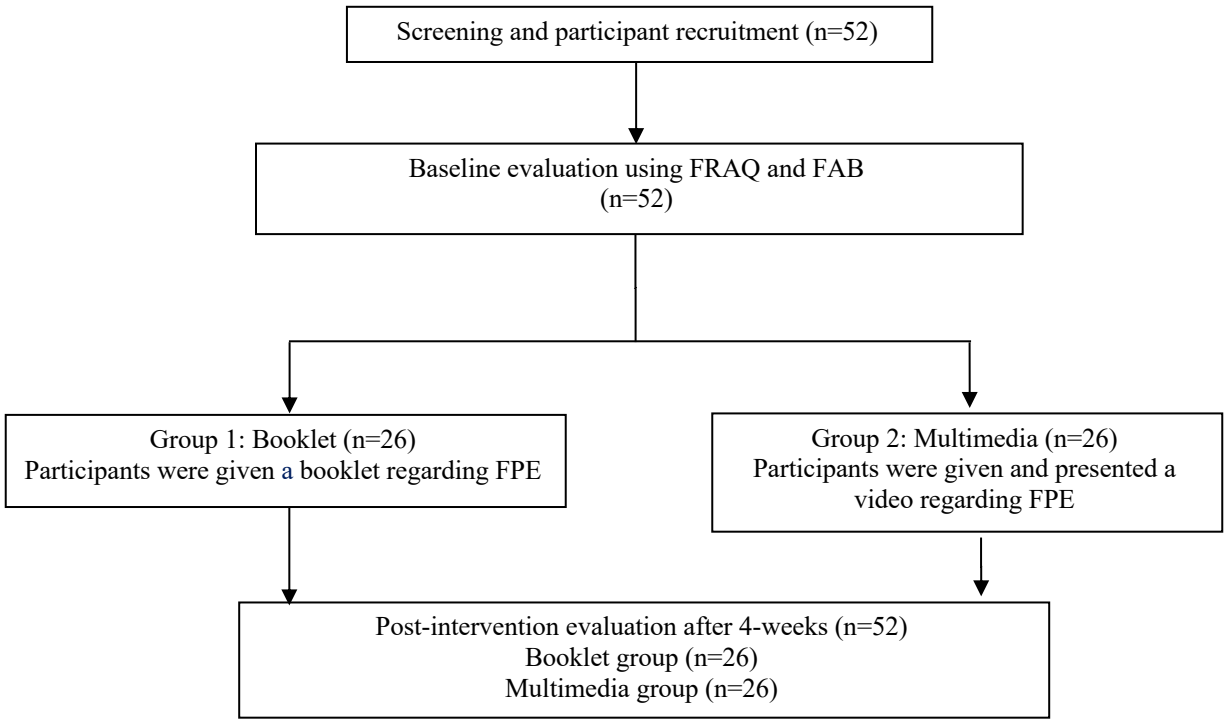

FIGURE 1. Flow chart of study protocol

TABLE 1. Demographic characteristics of participant

Socio-demographic variables	Booklet group (n=26)		Video group (n=26)		Covariate Analysis
	Mean	SD	Mean	SD	P value
Age	65.46	4.88	66.9	5.25	0. 226
Gender (Female : Male)	(15 : 11)		(19 : 7)		0.252
Education level	3.38	0.941	3.62	1.84	0.571
					Student t
Overall scores					P value (t value)
FRAQ	54.54	8.54	47.88	10.12	**0.02***(2.37)
FaB	16.81	2.67	15.50	3.57	0.14 (1.496)

*Sig. Effect (p<0.05)

TABLE 2. Mean score (Standard deviation) for each outcome measure of pamphlet and video group within week-0 and week-4

Outcome Measure	Study group mean (SD)				Analysis of covariance (p value)	
	Booklet		Video		Within-subject effect	Between-subject effect
	Pre (0 week)	Post (4 week)	Pre (0 week)	Post (4 week)		
FRAQ* Overall	54.54 (8.54)	55.69 (14.30)	47.88 (10.12)	49.65 (16.59)	0.89	**0.030***
Subdomain:						
Behaviour	79.08 (10.48)	79.15 (16.19)	67.62 (16.23)	71.88 (21.54)	0.49	**0.008***
Environment	64.62 (19.85)	63.08 (16.68)	49.23 (19.78)	56.92 (22.41)	0.20	**0.013***
Medical	46.88 (12.36)	55.85 (16.97)	46.81 (17.12)	47.15 (20.87)	0.12	0.265
Drug	31.31 (13.73)	36.54 (24.65)	33.85 (14.44)	30.77 (23.82)	0.715	0.311
FaB*	16.81 (2.67)	16.92 (3..37)	15.50 (3.57)	15.35 (3.20)	0.97	**0.040***

*Sig. Effect ($p<0.05$)

Analysis of covariate (ANCOVA) evaluation showed no significant within –subject effect in the mean scores of FRAQ ($p=0.89$) and FaB ($p=0.97$) post intervention in both groups. There was significant between subject effect ($p<0.05$) in the FaB and FRAQ (behavioural and environmental subdomains).

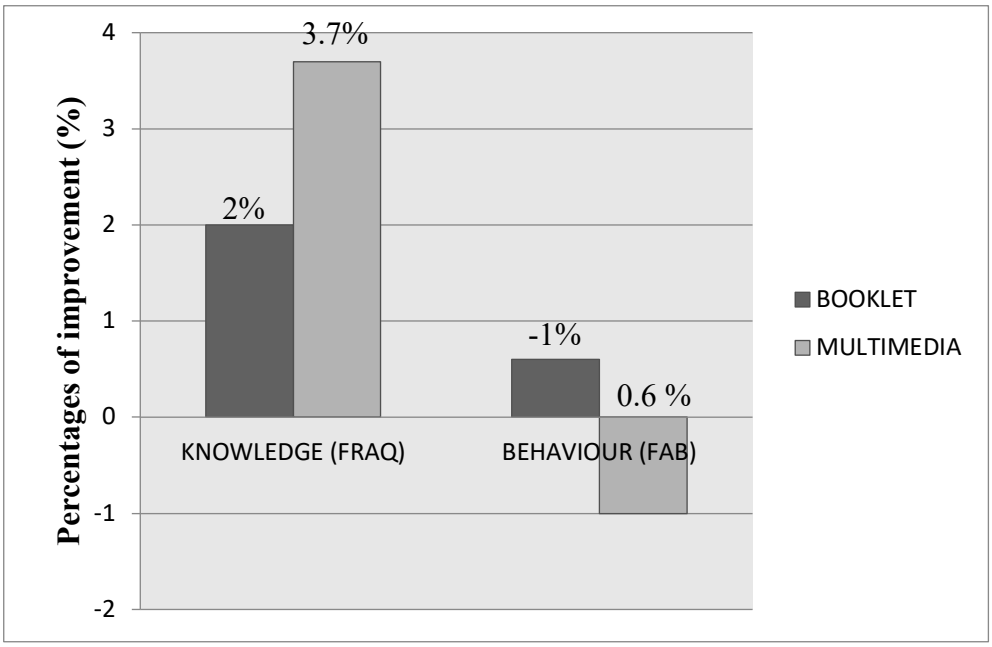

FIGURE 2. Percentages of improvement in knowledge and behaviour changes after 4 weeks of post-intervention

The percentages of improvement in knowledge and behaviour changes after 4 weeks of post-intervention areas shown in Figure 2. A greater change in FRAQ (knowledge) scores was noted in the video group but a positive change in the FaB (behaviour) mean was demonstrated in the booklet group. These results suggest that video presentation approach was more effective in improving falls knowledge among older adults. However, positive behavioural change was shown in the group educated using a booklet.

DISCUSSION

The aim of our present study was to examine the effects of FPE using two different delivery methods that included using booklet and video on falls prevention knowledge gain and practice of its prevention behavior among older adults.

We found that the group that used booklet had positive changes in regard to falls prevention behavior compared to the video group. This probably suggests that older adults were able to recognize falls risk factors via education provided using a booklet. Although booklet method may be less interesting in its design and delivery method, participants could take their time to go over its contents easily. This could have led to a change in the falls prevention behavior in daily living. It is believed that practice of falls prevention behavior can be brought about via related FPE intervention (Hill et al. 2009).

Although small, greater knowledge gain was shown in the group that received falls prevention education through video. It can be deduced that audio-visual modes of education may be more effective in conveying information due to its attention attracting features (*Journal of extension.* n.d.). This result is consistent with the findings of a previous study that showed video approach was superior in delivering falls prevention education to older adults in hospital settings when compared to written material (Hill et al. 2009). However, it is noteworthy that in the study by Hill et al. (2009) there were both falls prevention knowledge gain and behaviour changes.

Further analysis about FRAQ showed that knowledge gain in falls prevention was mainly in the behaviour and environment domains. These domains may be simpler to comprehend by our participants compared to medical and medication related issues. Moreover, only a single face-to-face session was conducted which may be insufficient to integrate motivational factors. Schepens et al. (2011) suggested that a motivationally tailored approach was more effective in facilitating and engaging older adults in falls prevention practice as participants can focus on relevant and specific goals. One of the possible reasons for contradictory findings in our study could be due to not emphasizing on the program goals and benefits. Future falls educational programs should provide such motivations to older adults to empower and engage older adults in the falls prevention behavior.

Our study was limited to studying older adults' prevention behavior after FPE using a video or booklet. In future studies, the impact of falls prevention education on actual uptake of fall prevention strategies and on subsequent falls rates after intervention is warranted. Secondly, we did not rule out the presence of any confounding factors such as age and education level that may have influenced the knowledge measurement scores. Lastly, the use of self-reported falls prevention behaviour may have resulted in under or over reporting of these behaviors.

However, it is noteworthy that our study compared the effectiveness of two educational approaches, which were delivered with similar contents. This ensured the participants regardless of their groups received similar information. In addition, we used evidenced-based instructional strategies to support delivery of FPE, in which older adult learners specific needs were addressed. Acceptance and preferences of FPE methods among older adults may be explored in future studies to provide client centered care.

CONCLUSION

Our study results demonstrated falls related knowledge gain and behaviour changes in older adults after FPE. Falls prevention education via video was effective in improving fall risk knowledge. Whereas, FPE booklet was effective in promoting fall prevention behaviours. There may be a possibility of using both these two approaches in combination to educate older adults about falls prevention strategies. FPE used as a routine health promotion may be beneficial as one of the falls prevention strategies among older adults and the wider community.

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