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Evaluating the Effectiveness of the Translated “A Matter of Balance” Fall Prevention Program Materials for Non-English Speaking Participants

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Abstract

A Matter of Balance (MOB) is an evidence-based fall prevention program shown to reduce fear of falling (FOF) in English speaking participants. The effectiveness of translated (Chinese and Spanish) MOB materials in reducing FOF is unknown. The objective of this study was to evaluate whether MOB was associated with reduced FOF in Chinese- and Spanish-speaking participants, and included an English-speaking comparison group. Participants were recruited from MOB classes in Massachusetts and Illinois. Investigators used the Falls Efficacy Scale-International (FES-I) and a demographic questionnaire to survey the participants at the first class (baseline), last class, and 6 months after the MOB course. Of the 90 participants who enrolled, 77 (85.6%) completed the course (Chinese [n=37]; Spanish [n=19], English [n=21]), and 54 (60%) completed the 6-month survey (Chinese [n=33], English [n=21]). Chinese FES-I scores significantly increased (FOF worsened) at the end of the course (+7.1, p=0.009) and 6 month survey scores were also significantly above baseline (+6.7, p=0.0088). FES-I scores decreased (FOF declined) in both the Spanish (-6.6, p=0.016) and English groups (-2.7, p=0.14) at last class, and English 6 month FES-I scores were slightly lower than baseline (-0.4, p=0.8). Participation in the MOB program did not reduce FOF in the Chinese population but MOB did show promise in reducing

FOF in both the Spanish and English groups. Future studies are warranted to explore the cultural, social, and education-related factors that may influence effectiveness of the MOB program.

Keywords

Fall prevention; A Matter of Balance; effectiveness; language; translated

Background

In the United States (US), falls are the leading cause of unintentional injuries and deaths in the elderly (CDC, 2013a; Stevens, Corso, Finkelstein, & Miller, 2006). Elderly falls are responsible for more than 2.5 million emergency department visits a year and cost the US healthcare system approximately 34 billion dollars (CDC, 2013b; Stevens et al., 2006). Education and awareness are crucial to prevent elderly falls, and the A Matter of Balance (MOB) program (Portland, ME) is an emerging evidence-based fall prevention program that aims to reduce fears of falling in older adults (Maine Health, n.d.). The MOB program was developed in the early 2000s, and the pilot program found that 6 months after completing the MOB program participants (who spoke English as a first language) had decreased fear of falling, improvement in their rate of falls, better management of mitigating falls (preventing/lessening/reducing risk of falling), fall control, and increased exercise levels (Maine Health, 2006). Until October 2014, the MOB program was primarily taught in English and with a few supplemental Spanish materials. Maine Health has translated the MOB program materials into Chinese, Russian, Spanish, and Portuguese languages so that non-English speaking participants may access the program. The original MOB program was created and validated with English speaking participants, and presently it is unknown if non-English speaking participants have the same reduction of fear and attitudes about falling as the English speakers with these translated MOB materials. Furthermore, within these various language groups it is not known if social or cultural factors may influence fear of falling. To our knowledge, this is the first study to examine the effectiveness of MOB for Chinese and Spanish speaking participants in the United States (US).

Purpose

The primary purpose of this study was to evaluate the change in fear of falling in older adults enrolled in either Chinese- or Spanish-speaking MOB programs. Our hypothesis for this study was that the MOB program would decrease the fear of falling within non-English speaking groups (Chinese and Spanish).

Methods

This was a prospective interventional study that was approved by the Tufts Medical Center Institutional Review Board. Participants were recruited from MOB classes that were hosted in senior centers, assisted living and independent senior living communities in greater Boston, Massachusetts area and Chicago, Illinois. Per the MOB program design, only ambulatory and community-dwelling individuals were included in the study. Non-ambulatory individuals were excluded. Participation in this study was voluntary and

participants could choose to withdraw from the study at any time. The English speaking group was the control group and the Chinese and Spanish speaking groups were the study groups. Courses in Spanish and Chinese were taught by MOB trained Coaches and Master Trainers that were fluent in Spanish and specific Chinese dialects. Consistent with fidelity requirements associated with the licensing agreement with MOB and the methodology from Healy et al. (2008), all MOB courses were taught in the same manner to ensure program efficacy and consistency.

To assess participant fear of falling, the Falls Efficacy Scale-International (FES-I) (Dewan & MacDermid, 2014; Yardley et al., 2005) was completed by the participants in-person at the first class, last class, and 6 months after the completion of the course. The FES-I is a 16-item scale that ranges from 16 (no concern of falling) to 64 (severe concern of falling). The FES-I has been validated and translated into several languages by the Prevention of Falls Network Europe (2011) (ProFANE). ProFANE (2011) has translated the FES-I into Chinese and Spanish and both are pending validation.

The MOB program questionnaires collect basic demographical data including age group (<60, 60–64, 65–69, 70–74, 75–79, 80–84., 85–89, and 90–94 years) and current fear of falling. An additional translated demographic questionnaire (created by the investigators) was also completed at the first class and 6 months after the course. This questionnaire included questions about education, number of falls in the past 6 months, country of birth, number of years in the US (if applicable), health conditions, and use of any personal assistive devices. If the participants were not present at the 6 month follow up, they were either mailed the FES-I and demographic questionnaire (with a pre-paid envelope to return completed surveys) or called by the Coach/Master Trainer that led their course to complete the surveys via phone interview.

The FES-I means at baseline and last class were compared across the language groups using ANOVAs, and differences in FES-I means from the first class to 6 month follow up were also compared within language groups using paired t-tests. Data from the demographic questionnaires were used to examine possible differences in program efficacy related to linguistic and education factors. All statistics were analyzed using SAS v9.3 (Cary, NC) and significance was defined by a p-value <0.05.

Results

Of the 90 participants that enrolled (Chinese, n=37; Spanish, n=25; English, n= 28), 77 (85.6%) completed the MOB course. The Chinese (n=33) and English (n=21) groups also completed the 6 month follow up surveys. Females comprised the majority of participants in all 3 groups (n=78; 87%); the Chinese group was significantly older than both the English and Spanish groups (p=0.04). The mean number of chronic health conditions was similar among all language groups (Chinese= 1.5; English= 1.3, Spanish= 1.5). The demographic characteristics of the three MOB groups in the study are presented in Table 1. Table 2 shows the mean FES-I scores and number of falls reported by participants.

The mean change in FES-I scores from the first class to last class were higher in the Chinese (+7.1 points, $p=0.009$), less in the Spanish (-6.6 points, $p=0.016$), and less in the English (-2.7 points, $p=0.142$), thus fear of falling increased in the Chinese but decreased in the Spanish and English. Mean FES-I scores from first class to 6 month follow up increased in the Chinese (+6.7 points, $p=0.008$) but slightly decreased for the English (-0.4 points, $p=0.767$). Additionally, the mean raw FES-I scores were much higher in the Chinese (first class= 40.9; last class= 48.0; 6 month= 47.2) for all survey periods compared to the Spanish (first class=32.0; last class= 27.5) and English (first class= 28.9; last class= 25.0; 6 month= 27.0).

The demographic questionnaire asked participants if they had a fall within the 6 months prior to taking MOB (obtained at first class) and were re-evaluated 6 months after MOB to see if they had fallen since completing the MOB program. The Chinese group had an increase in participant falls from 6 people sustaining a fall in the 6 months prior to taking MOB (17%) to 10 participants sustaining a fall within the 6 months after completing MOB (30.3%). The English group had a decrease in falls from 5 participants sustaining a fall 6 months before MOB participation (19%) to 3 participants sustaining a fall 6 months after completing MOB (14.3%).

Discussion

This was a novel prospective study that evaluated the efficacy of Chinese and Spanish speaking participants that completed the MOB fall prevention program. The study found that the Chinese group had higher fear of falling than the English and Spanish groups at baseline, and the Chinese group's fear of falling continued to increase after participation in the MOB program. The Chinese group had higher FES-I/fear of falling scores across all time points than both the Spanish and English groups, and the exact or possible determinants of why the Chinese were more fearful of falling was not determined by this study. Baseline FES-I scores were significantly different among all groups ($p<0.0001$) which suggests that one's language and culture could be a pre-disposing factor in how they perceive their risk and fear of falling. The Chinese group had higher FES-I/fear of falling scores across all time points than both the Spanish and English groups. There was a significant difference in level of education between all language groups ($p<0.0001$) with the majority of Chinese and Spanish speaking participants having less than a high school education. Additionally, FES-I scores were significantly higher ($p=0.008$) from the first class to the 6 month follow up in the Chinese group than the English group, and the reason(s) for this increase in fear of falling were not identified in this study.

MOB Fidelity, Course Implementation, and Completion

As required by the MOB licensing and fidelity agreements, all Coaches and Master Trainers who participated in this study had received the mandated MOB trainings and strictly followed the MOB course structure. Despite compliance with the fidelity and delivery of the MOB program by all course instructors, the fear of falling in the Chinese group did not decrease as it did for the English and Spanish groups. The cause for this variation in the Chinese group was not identified in this study.

The completion rate for all participants in this study was 86% (the Chinese group had 100% completion rate), which is similar to the completion rates of other MOB related studies (Healy et al., 2008; Howland et al., 1998). The 6-month follow-up surveys with the Chinese and English groups had a completion rate of 84%. Most participants in this study were female (n=78; 86%), which is also consistent with other fall prevention literature with Massachusetts older adults (Howland et al., 1993; Howland et al., 1998; Tennstedt et al., 1998). The course completion rates for this study were also similar to the MOB program translation research by Healy et al. (2008) and that after 1.5 years, only 226/335 (68%) of participants completed the MOB course and 6 month follow up survey, but only 129/224 (58%) completed the 12 month follow up.

Impact of Age and Literacy

This study found that the Chinese group was significantly older than the English and Spanish groups (p=0.04) which may partially explain why the Chinese FES-I scores did not improve at the end of the class. Although the Chinese group was older in general, this group had the least amount of individuals using a personal assistive device (39%) compared to the English (48%) and Spanish (65%) groups. It is important to note that the Chinese had the same amount of mean health problems compared to the English and Spanish groups, and they are comparably in the same physical health and wellness condition as the other English and Spanish participants in this study.

There were a few unexpected findings and barriers when the Coaches and Master Trainers facilitated the MOB courses in this study: the low literacy of the participants and their ability to comprehend the content of the questions on the surveys. Across all language groups, and especially within the Chinese group, many of the participants could not read or write. The results of this study could have been impacted by the low literacy of the participants in this study, and furthermore the translated MOB materials were not appropriate for the literacy level of most participants who did not speak English. The MOB program materials were translated at a 6th grade reading and comprehension level and the program does not require a specific level of literacy for which the participants can enroll. This study elucidated that some participants who do not speak English as a first language may need to have program materials written and tailored to their current literacy and comprehension ability which may be below a 6th grade level.

Cultural Influences of MOB Effectiveness and Generalizability

After an extensive literature search for information about language translated evidence-based falls prevention programs, the investigators of this study could not find any relevant evidence on the efficacy of language translated fall prevention programs. There are several articles that discuss and describe how a fall prevention or exercise program has been disseminated into another setting or country of the same or similar language (Guse et al., 2015; Li et al., 2008; Li & Harmer, 2014), but these studies did not incorporate language translation into the program dissemination. There are also literature reviews and focus group studies that have highlighted cultural and linguistic barriers to effective fall prevention programming (Horton & Dickinson, 2011; Jang et al., 2015), however these studies primarily focused on

adherence, compliance, and acceptance to exercise and in-person fall prevention programming.

The purpose of this study was to evaluate if the translated MOB materials were effective in reducing fear of falls in the Chinese and Spanish speaking groups, but we cannot identify any specific evidence to support our findings for why the Chinese group's fear of falling increased after participating in MOB. Research by Jang et al. (2015) suggests that evidence-based fall prevention programs taught to culturally and linguistically diverse (CALD) groups of participants may not be a "one-size-fits-all". Generalizability is a commonly cited limitation within fall prevention programming literature due to studies having: 1) no control/comparison group or study blind (Aizen, Lutsyk, Wainer, & Carmeli, 2015; Alvarez et al., 2015; Healy et al., 2008; Li & Harmer, 2014; Wurzer, Waters, Hale, & de la Barra, 2014) 2) high attrition and/or low sample sizes (Cho et al., 2015; Healy et al., 2008; Howland et al., 1998; Ory et al., 2015; Sosnoff et al., 2015; Wurzer et al., 2014), and 3) self-reported outcomes data and use of unstandardized/non-validated outcomes measures (Ory et al., 2015; Tennstedt et al., 1998; Wurzer et al., 2014). It is important to note that Howland et al. (1998) concluded their Boston based fall prevention program for English speaking participants "may not be generalizable within Massachusetts or the country". Based on these limitations and the results of this study, it is difficult to affirm that a language translated fall prevention program, like MOB, may not be culturally relevant, adaptable, or generalizable for non-English speaking groups. It is also important to note that the results of this study do have an indirect clinical significance for healthcare professionals, and there are many examples of indirect clinical impacts of fall and violence prevention programs within the literature (Crandall et al., 2016; Allee et al., 2018; Bell et al., 2018). Healthcare professionals that are referring fall risk patients to community or evidence-based fall prevention programs need to understand the limitations of these programs and that they are not a one-size-fits-all. The results of this study suggest that the MOB program may not be beneficial for all community dwelling senior citizens due to literacy and cultural relevance concerns for those that do not speak English as a first language. To this end, healthcare professionals need to be aware and consider their patients' individual needs when referring their patients to a community based fall prevention program in order to prevent future falls that may have detrimental clinical consequences.

Future Research and Considerations

There are several considerations and recommendations for future research of falls prevention program planning and implementation for programs like MOB. First, it is recommended that language translated fall prevention programs utilize a validated participant outcome measurement tool to assess fear of falling in all participants. Currently, the MOB program does not recommend, utilize, or promote any participant outcome measurements aside from a few questions within the MOB course materials. Second, future research is needed to evaluate if increased awareness of falls and their dangers can directly or indirectly cause an increase in fear of falling. This was evidenced by several participants in this study that stated the MOB course didn't make them more fearful, however they are now more cautious and aware of the potential dangers around them because they are now more informed. To this end, future studies also need to consider age-related needs and unavoidable obstacles when

working with the senior citizen population. The primary reasons for attrition in this study were: declining physical and mental health, prolonged hospitalization and unexpected death. These reasons for attrition have been documented within the published literature (Kasai et al., 2017; Van der Kooi et al., 2017) and this study reaffirms these important considerations.

Third, additional studies are needed to evaluate how culture and ethnicity may affect participants' fear of falling so that future fall prevention programs can be tailored to the needs and norms of these diverse populations. Lastly, due to the preponderance of low literacy participants in this study, it is recommended that MOB Master Trainers and Coaches consider their participants' level of literacy and comprehension abilities when planning their courses.

Conclusion

The MOB program was not effective in reducing fear of falling or number of falls in Chinese-speaking participants but seemed to help reducing fear of falling in both English and Spanish participants. MOB raises awareness about fall risk behaviors and hazards; however increased awareness of these dangers could be a contributing factor to higher fear of falling scores. Participant literacy is a potential barrier for the MOB program as low literacy may impede one's ability to comprehend and complete the MOB program and questionnaires. This study found that although an evidence-based program may be translated into a specific language we do not have specific answers as to why the program was not effective in reducing the fear of falling for non-English speaking participants. Future studies are warranted to evaluate the cultural, linguistic, and social influences that may affect fear of falling.

Limitations

There were many limitations in this study. First, as with the original studies from the MOB (Healy et al, 2008; Tennstedt, 1998), our sample size was small (MOB limits the class sizes to 8–12 participants per course), which may limit the generalizability of our findings. The investigators were not able to gather the 6-month follow up data from the Spanish speaking group, thus this study was not able to estimate longer-term effectiveness of the MOB program for the Spanish group. In addition, MOB courses were conducted during all seasons of the year, and some of the winter courses were postponed several weeks due to snow and unprecedented winter weather. Seasonal weather conditions in the course locations (Northeast and Midwestern United States) could have biased the data. Due to concerns about their immigration status, many potential non-English speaking participants were reluctant to join in the study. Second, participant's low literacy level and ability to comprehend the content of questions asked were unforeseen obstacles that the investigators had to accommodate throughout the study. Coaches and Master Trainers often had to assist participants by reading aloud and assisting in writing and completing some of the surveys. Making these course accommodations were time consuming and labor intensive on behalf of the Coaches and Master Trainers. This study also found that establishing trust between the participants and the master trainers and/or coaches was important as many participants across all language groups were hesitant to disclose their fall history and current fears of

falling. Recall bias of falls and hesitation to disclose previous falls is common in the senior citizen population (Kasai et al., 2017; Cleary & Skorniyakov, 2017), and it is possible that the participants in this study did not accurately report their number of falls and fear of falling due to lack of trust or other undisclosed fears (e.g.- losing their independence, stressing family relationships, jeopardizing their public housing status, etc.).

Lastly, this study was not designed to explain or identify why the MOB program did not reduce the fear of falling in each language group. This limitation should be considered when designing future MOB or other evidence-based fall prevention studies.

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Key Points

- This study found that translated A Matter of Balance (MOB) program materials were not associated with reduced fear of falling in Chinese-speaking participants but did seem to reduce fear of falling in the English and Spanish groups.
- The MOB program was effective in reducing the amount of falls from 6 months prior to MOB to 6 months after completing the course in the English group while the Chinese group had an increase in falls during the same time period.
- Future studies focused on evaluating the cultural and language/literacy impacts of evidence-based fall prevention programs like MOB are warranted.

Table 1:

Demographic Characteristics by Language among Matter of Balance (MOB) Participants

Language of MOB Class (n)	Chinese (37)	Spanish (25)	English (28)	p-value
Female Gender (n, %)	28 (78)	22 (88)	27 (96)	0.057
Age Category (n, %)*				
<75	9 (25.0)	12 (42.9)	15 (65.2)	0.042
75–79	14 (38.9)	10 (35.7)	4 (17.4)	
>79	13 (36.1)	6 (21.4)	4 (17.4)	
Countries of Origin (n)	China (34) Hong Kong (1) Philippines (1) Taiwan (1)	Bolivia (1) Cuba (4) Dominican Republic (11) Peru (1) Puerto Rico (3) No Answer (5)	United States (27) Cuba (1)	N/A
Mean Years in the US (SD)	27.5 (12.3)	22.3 (17.8)	N/A	N/A

* missing n=3

Table 2:

Survey Answers by Language for Participants Who Completed the MOB Course

	Chinese (37)	Spanish (25)*	English (28)	p-value
Education (n, %)				
Less than high school	23 (64)	14 (67)	3 (12)	<0.0001
High school	4 (11)	7 (33)	18 (69)	
College and higher	9 (25)	0	5 (19)	
Mean number of health problems (SD)**	1.5 (0.9)	1.3 (0.9)	1.5 (1.2)	0.8352
Use of an assistive device (n, %)***	13/33 (39)	13/20 (65)	11/23 (48)	0.1942
Baseline: Had 1 fall in past 6 months (n, %)	6/36 (17)	3/22 (14)	5/26 (19)	0.8744
Completed final class FES-I (n, %)	37 (100)	19 (76)	21 (75)	0.0009
Baseline FES-I Mean (SD)	40.9 (12.6)	32.0 (10.8)	28.9 (10.0)	0.0001
Final Class FES-I Mean (SD)	48.0 (12.3)	27.5 (8.3)	25.0 (7.2)	<0.0001
Mean change from baseline (paired t-tests)	7.1 (15.6) p=0.009	-6.6 (10.9) p=0.016	-2.7 (7.9) p=0.14	-
Completed 6-month follow-up FES-I (n, %)	33 (89)	-	21 (75)	0.18
6 month FES-I Mean (SD)	47.2 (14.3)	-	27.0 (9.6)	<0.0001
Mean change from baseline to 6 month (paired t-tests)	6.7 (13.8) p=0.0088	-	-0.4 (5.8) p=0.8	-
6 month f/u: Had 1 fall in past 6 months (n, %)	10/33 (30.3)	-	3/21 (14.3)	0.18

* Six-month follow-up surveys were not available from Spanish-speaking MOB group

** Diabetes, hyper- and hypotension, heart condition, neuropathy, lung condition, stroke, other

*** Walker, cane, hearing device, vision device, other