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The Effect of an Education Program Based Onprotection Motivation Theory (PMT) on Improving Nutritional Performance of Elderly People

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Abstract: A theory-based education program can increase the participation of elderly people in terms of good nutritional behaviors. This study aimed at assessing the effect of an education program based on Protection Motivation Theory (PMT) on improving nutritional performance of elderly people. This quasi-experimental study was conducted on 200 elderly people over 60 years of age in the city of Hamadan in early April in 2015. The PMT-based questionnaire and a checklist of food groups were modified based on Iranian culture. According to experts, the questionnaire received adequate scores in terms of CVR and CVI within the acceptable range and its Cronbach's alpha coefficient was calculated by 83%. The education program was conducted in the form of lectures and group discussions via brainstorming method and the data were collected before and 2 months after the implementation of the intervention. The data were also analyzed using measures of central tendency, dispersion, independent and paired t-tests, one-way ANOVA, Chi-square and correlation coefficient at a 95% confidence level. Following the educational intervention, the results of the paired t-test showed that the mean scores of knowledge, behavior, protection-motivation, fear, perceived severity and the items of food frequency questionnaire had increased significantly in the experimental group, unlike the control group, compared to the mean scores before the educational intervention ($p<0/001$). This study revealed that the PMT-based education program had an effect on the improvement of nutritional performance of the elderly people; however, further investigations in other age and gender groups as well as using other educational methods were also recommended.

Key words: Health education, Protection Motivation Theory (PMT), nutritional, performance, elderly people

INTRODUCTION

Aging population is the result of advances in medical and health science as well as social development. This increase is noticeable in Iran and other countries in a way that this increase compared with the 7.1% annual growth in world population is considerable and higher than 2.5% (Dorosty, 2007). Demographic transition in developed countries has a higher rate and if this rapid transition occurs in poor societies, they will have less time for aging population in terms of planning. The increasing number of elderly people has focused the attention of international community on improving the quality of life in the elderly particularly based on provision of healthcare (WHO, 2010). Nevertheless, nutritional status in older people is an important issue that has received little attention in developing countries. Nutrition can affect mortality, morbidity and quality of life in elderly people (WHO, 2002). From the perspective of the World Health Organization (WHO), elderly people are considered as a new force in the road to development. In today's world, a demographic revolution is taking place since there are globally about 600 million people aged 60 or over. This amount will double in 2025 and it will reach to 2 billion people in 2050 and most cases will live in developing countries. The number of people over 60 years of age in

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Iran in the last national population and housing Census in 2007 was 5.119 million people constituting 2.7% of the population. It is estimated that over the next 25 years (since 2026), it will reach to about 10%. According to the latest statistics from the Ministry of Health, 7.26% of Iran's population is comprised of individuals over 60 years of age (Cheng *et al*., 2002).

Provision of healthcare for the elderly as one of the most vulnerable groups in society is of health priorities (Fralic and Griffin, 2001). According to the WHO in the statistics report in 2010 as well as some other sources, those ages 60 years old and over are considered as senior citizens or elderly (Mowe *et al*., 1994). The results of numerous studies worldwide have shown that nutritional status plays a prominent role in the health and disease of people aged 65 years old and over and it is the most important factor affecting the low-income and poor elderly (Nes *et al*., 2001). Several studies have demonstrated that poor nutritional status increases not only hospitalization rate but also complications, mortality, lower quality of life and duration of hospitalization among the elderly people. Poor nutrition once considered as part of the normal aging process is a common problem in the elderly. But in fact it is can be identified, prevented and treated and its early diagnosis provides timely intervention. A large proportion of chronic diseases affecting the elderly can be prevented and treated by improving nutrition. This also emphasizes the importance of screening for nutritional status in the elderly people (Brownie, 2006; Mourey *et al*., 1988; Sullivan *et al*., 1989; Colledge and Ford, 1994). Nutrition in this age group is very important although it has received little attention in developing countries (Colledge and Ford, 1994). The results of some studies showed that almost 35% of cases of cancer are associated with unhealthy eating habits (Edington *et al*., 2000). One of the most significant causes of nutritional problems is lack of knowledge on nutrition which results in poor performance in this regard and brings about problems such as malnutrition and the risk of non-communicable diseases. To promote the level of knowledge among the elderly in the field of good nutrition and food consumption patterns of this sector of society, proper education programs can be designed and implemented. Nutrition education is a combination of intervention strategies designed to make an informed choice of food and other nutritional behaviors that lead to health and well-being in individuals (Hall *et al*., 2000). The first step in nutrition education is raising awareness on the importance of good nutritional behaviors as increased awareness of nutrition results in changes in behaviors which means good nutritional behaviors are substituted for wrong ones (Laws *et al*., 2000). The effectiveness of education depends on appropriate use of theories in behavioral science (Omran and Morley, 2000). In designing interventions in nutrition education using theoretical frameworks is also recommended (Eshaghi *et al*., 2007). Such theories can help examine interventions, speculations and assumptions with regard to strategy and objectives; therefore, today, the use of theories for education and health promotion specialists is almost mandatory (Havas *et al*., 1998).

Selecting a framework for health education is the first step in the educational planning process (Strinmetz and Potter, 1996). Among these theories is Protection Motivation Theory (PMT) focused on understanding and predicting health behaviors individuals show to protect themselves against traumatic events (Farivar *et al*., 2009). Thus, the application of this model helps to understand risk behaviors better and provides the context to reform unhealthy behaviors (Contento, 2007).

Given the above mentioned issues, it seems that the assessment of nutritional status of the elderly is one of their medical needs. Therefore, this study aimed at assessing the effect of educational intervention on the elderly people in order to clarify the influential factors and design and implement appropriate and objective interventions to reduce nutritional problems among these senior citizens.

MATERIALS AND METHODS

This quasi-experimental study was conducted in a form of pre and post-test with two groups (experimental and control) of the elderly people aged 60 years old and over in the city of Hamadan. The results of the pilot study showed that nutritional knowledge in the elderly was 5.13% and the researchers claimed that this value will promote to 5.83% through education. On the basis of the sample size, 95% confidence level, 90% study power and taking into account the with drawal of some individuals from the study according to the fit formula; 200 individuals selected through simple and convenient sampling were employed (100 individuals assigned to the experimental group and 100 people to the control one). Matching was also performed in the experimental and control groups regarding demographic variables. The inclusion criteria in this study were the age of 60 years old and above and physical health (i.e., the ability to attend educational classes). The data collection instrument included a PMT-based questionnaire and a questionnaire designed based on the structure of Willett Food Frequency Questionnaire containing seven sections. The first section consisted of 4 items about demographic data and the second section included 4 items related to knowledge assessment with answers including true-I do not know-false. Each true answer was scored 2 and the

answers I do not know and false were assigned 1 and zero, respectively. The third section was composed of five items associated with performance measurement with always-sometime-never answers scored two, one, zero, respectively. The fourth section had 4 items related to the assessment of attitudes with answers including agree-neutral-disagree scored, respectively two, one and zero. The fifth section consisted of 4 items related to fear assessment with answers never-hardly ever-often-sometimes-always. Each always answer was scored 4 and each sometimes answer was scored 3. The answers often, hardly ever and never were scored 2, 1, 0, respectively. The sixth section was composed of 4 items associated with the assessment of perceived severity with answers including strongly agree-agree-neutral-disagree-strongly disagree. Each strongly agree and agree answer was scored 4 and 3, respectively. Scores 2, 1, 0 were also assigned to neutral, disagree, strongly disagree answers, respectively.

The seventh section included 17 items associated with the assessment of level of food consumption. This questionnaire was designed based on the structure of Willett Food Frequency Questionnaire. The food groups examined in this study were elicited from other studies and modified based on Iranian food items. Finally, 17 food groups were obtained including whole-grains, cereals, potatoes, dairy products, vegetables, fruit, meat, beans, meat, nuts, oils (liquid and solid), tea and coffee, pickles, simple sugar, honey and jams, drinks, desserts and snacks with answers high-medium-low. Each high answer was scored 2 and each medium and low answer was scored 1 and 0, respectively. The content of the items was considered in relation to the consumption of food items according to standard serving size or the amount normally known for people in society. According to specialists, the validity of the PMT-based questionnaire with 95% coefficient received the adequate score within the acceptable range in terms of CVR and CVI. The Cronbach's alpha for the items of this study questionnaire implemented in the pilot form was calculated as 83%. The teaching method was in the form of lectures, brainstorming and subsequent discussions because the elderly needed to express their negative attitudes and barriers to provide correct information and have right motivation in the later stages in order to adopt healthy behaviors. At the end of the education session a poster of the food pyramid was given to participants to install in their home kitchens in order to have continuous exposure to health messages. As well an educational manual with useful information about the types of food and their benefits was distributed among the participants to increase their awareness and knowledge levels. The 2 months after the final educational session, the questionnaires were re-administered to the participants. Fortunately, none of the participants were excluded from the study and all the 200 participants in the first part re-completed the questionnaires. The data were analyzed by using the SPSS16 Software and compared using measures of central tendency as well as independent and paired t-tests, one-way ANOVA, Chi-square and Pearson correlation coefficient with 95% confidence level. It should be noted that in order to observe research ethics, the educational program was held for the control group in two sessions after finishing the research.

RESULTS AND DISCUSSION

Of the total number of the elderly people in this study, 117 individuals were female and 83 individuals were male. Among the participants of this study, 112 individuals aged 60-70 years old, 109 participants had high school diploma and 91 people held university degrees. The 83 individuals had incomes ≤270,000 tomans (about 78 dollars) per month and 117 people earned >270,000 tomans (about 78 dollars) a month. Increased age had reduced knowledge, attitude and performance of the elderly people and this relationship was statistically significant (p<0/001). There was also a statistically significant relationship between level of education and level of knowledge among the elderly (p<0/001). As well; there was a statistically significant relationship between knowledge, attitude and performance with gender and income in a way that the scores obtained by the elderly with higher income were more than those by the other groups. In Table 1, the mean and the standard deviation of the structures examined are presented separately for the experimental and the control groups (Table 1).

Table 1: The evalution of mean, standard deviation and standard deviation of knowledge, behaviour, motivation, fear, perceived severity of the study population by sex

Groups	Mean·SD	SD	Mean	Number
Awareness				
Control	0.11390	1.13902	5.3400	100
Intervention	0.08250	0.82505	5.8100	100
Practice				
Control	0.25589	2.55888	6.2400	100
Intervention	0.11121	1.11210	7.6600	100
Protection motivation				
Control	0.14250	1.42503	7.3600	100
Intervention	0.10188	1.01876	7.6500	100
Fear				
Control	0.19618	1.96176	6.9000	100
Intervention	0.34617	3.46171	12.4200	100
Severity				
Control	0.14404	1.44036	10.6900	100
Intervention	0.19618	1.96176	13.3000	100
Self-efficacy				
Control	0.39402	3.94020	7.9900	100
Intervention	0.46637	4.66368	12.2600	100

Table 2: Paired t-test knowledge structures, protection motivation,

performance, fear, severity, and food frequencey questionnaire subjects in the intervention group training

Parameters	p-values (2-tailed)
Awareness	0.004
Practice	0.000
Protection motivation	0.968
Fear	0.151
Severity	0.000
Self-efficacy	0.000
Willett food frequency questionnaire	0.000

Moreover, following the educational intervention, the results of the paired t-test showed that each structure including knowledge, behavior, protection-motivation, fear, perceived severity and the items of food frequency questionnaire were significantly different compared to the status of each structure before the educational intervention (Table 2).

CONCLUSION

In this study, the mean scores in all six areas in elderly men after the educational intervention were higher than those before the intervention. In a study by Samadi *et al.* (2004) on the examination of knowledge, attitude and performance of the elderly by using a healthy lifestyle and through a questionnaire on the elderly people in the city of Tehran; the mean scores obtained after educational intervention were significantly higher than those before the intervention (Croll *et al*., 2001). As well, the results obtained were consistent with the results obtained by Longman (1997) on determining the status of the elderly diet. Shams and Atarodi (2001) and Chernoff (2001) also found similar results (Lynch and Happell, 2008); however, the results by Richman were in contrast with the findings of this study. In general, the results showed that the elderly people had moderate knowledge and relatively good attitudes and behaviors. Nevertheless in the study by Samadi *et al.* (2004), the individuals studied had relatively low knowledge, attitude and performance in terms of healthy lifestyle which could be due to the high average age of the participant elderly people (Samadi *et al*., 2007; Horwath *et al*., 1992; Chernoff, 2001; Richmond *et al*., 1996). In the present study, there was a statistically significant relationship between level of education and level of knowledge among the elderly ($p<0/01$). In most of the previous studies, a significant statistical relationship was also found between level of knowledge and literacy rate which reflects its role as one of the important social factors affecting health. The findings of the present study demonstrated that the scores of level of knowledge and performance in the elderly people with higher income and education whose costs of living were provided through their own salary or payment was more than those in the elderly people whose costs were met by other ways such as their children or supporting institutions. Ryan *et al.* (1992) found similar findings that could result from the use of experiences and interactions with others in different societies. On the other hand; increased age had reduced knowledge, attitudes and performance in the elderly people which can come from isolation, lower interaction and decreased level of health in these people. In a study by Samadi *et al.* (2004), the earned scores by the elderly in the social field were higher than those by inactive elderly people (Chernoff, 2001; Richmond *et al*., 1996; Ryan *et al*., 1992). However, the results of a longitudinal study on women aged 70-75 years old showed that healthy behaviors is a stronger predictor of premature death compared with other social factors (Ford *et al*., 2008). Although, sociologists believe that lifestyle and healthy behaviors depend on the character of the person who is affected by the factors and social conditions in which people are born, grow up, live and get old rather than being influenced by individual factors. Therefore, comprehensive and detailed planning with a proper nutritional performance approach affecting health is essential to maintain and promote health in age groups including the elderly and improve people's attitudes to lifestyle.

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