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Research Article

Effectiveness of Self-medication Prevention in the Elderly based on the Protection Motivation Theory

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ABSTRACT

Introduction: Self-medication in elderly can lead to different complications. The aim of the present study was determining the effectiveness of the intervention self-medication prevention in the elderly based on protection motivation theory.

Method: This quasi-experimental interventional study was conducted on young elderly in the city of Ahvaz. For this purpose, 75 individuals as the experimental group and 75 individuals as the control group were randomly selected for the study. And, after one of training, they were followed for two months. The data collected were analyzed using the statistical software SPSS version 16 and employing t-test and chi-squared test.

Results: After the implementation of the educational program, significant difference in the increase of mean scores of perceived susceptibility, perceived severity, and perceived fear in the elderly in the in the experimental group ($P<0.05$). However, no significant association between the use of educational programs and the reduction of self-medication in the experimental and control groups was found ($P>0.05$).

Conclusion: the programs prepared for the prevention of self-medication in the elderly based on the protection motivation theory is effective enough to be implemented in broader environments.

Keywords: Fear, Threat, Self-medication, Educational Intervention, Health Promotion, Health Education

INTRODUCTION

Nowadays, due to advancements in medicine and consequently the reduction of infant mortality, reduction of fertility rate, changes in the economic, social, and political conditions and welfare status, the elderly have the fastest growth rate among different age groups in the world. And the highest level of increase in the elderly population will occur in developing countries including Iran (1). The statistics show that the population of the elderly aged over 60 years in the world was 10 percent and it will increase to 22 percent by 2050 (2). According to the 2011 census, the elderly accounted for the 8.2 percent of the total Iranian population and it is estimated

that the population will pass 10 percent in the next ten years (3, 4). The United Nations categorizes the population structure of countries based on the ration of the elderly population into three categories of the young, adult and elderly. And on this basis, it considers countries with 4-6 percent elderly population as adult. Therefore, Iran is considered to be among adult countries (5). Therefore, paying attention to the elderly for maintaining and improving their health is highly significant for every country, especially developing countries (6). Statistics show that 53 percent of the causes of death are related to unhealthy lifestyle and behaviors (7). On the other hand, the common diseases of the elderly can be prevented by observing a healthy lifestyle (8). Thus, having a healthy lifestyle that includes exercises, an appropriate diet and other factors related to a healthy lifestyle is important in all stages of life, including old age, and can lead to health improvement (9). Studies have indicated that old age is a sensitive period in human life and paying attention to the problems of requirements of this period is a social necessity. And self-medication in the elderly requires a special attention as this group is more vulnerable, compared with other age groups (10, 11). Therefore, elderly, due to being afflicted with diseases more, may self-medicate and thus be more afflicted with medicine-related complications. In addition, biochemical, physiological and pharmacokinetic changes in the elderly lead to too much or inappropriate medicine consumption (12). In this regard, the necessity of intervention and education regarding the reduction of self-medication has been pointed out in different studies; for example, Shanker et al have considered educational programs to be necessary in this regard by pointing out self-medication in developing countries in their paper (13). De Melo et al have pointed out that paying attention to education and promotion of appropriate patterns of medicine use is useful in medicine abuse prevention (14). The study by Jackson indicated that wrong beliefs on medicine was common among the explored population and clarified the necessity of education in this regard (15). Balbuena et al pointed out that self-medication in elderly is a problem that should be especially followed in public health policies and the factors impacting this behavior such as socioeconomic characteristics and health services for the elderly should be dealt with by designing appropriate studies and interventions (16). On the other hand, the effectiveness of educational programs in changing favorable behaviors will be more as much as they have a theoretical support based on basic health needs (17). In this regard, protection motivation theory was introduced by Rogers in 1975 and, since then, it has been widely used as a framework for prevention and intervention in health-related behaviors. This theory was initially developed to describe the impacts of fear on health-related behaviors and attitudes. The connections resulted from the creation of fear have a significant impact on choosing behaviors. Threat appraisal asses the maladaptive behaviors. The threat appraisal process includes intrinsic and extrinsic rewards and the perception of the threat (severity and vulnerability). The coping appraisal process assess the ability to cope with and tackle the threat of the risk. The factors in coping appraisal process include the variables (response efficacy and self-efficacy) and response costs (18). It seems that, by using this theory, appropriate educations can be provided for encouraging the elderly to avoid self-medication. Therefore, the present study was designed with the objective of exploring the effectiveness of self-medication prevention as an intervention in the elderly based on the protection motivation theory.

METHODS

This study was an interventional study of pre-test-post-test control group design that was conducted in summer 2016 on the young elderly in the city of Ahvaz. For sampling, after coordinating with the related authorities, 150 young elderly in the city of Ahvaz were selected using convenience method and they were randomly divided into two groups i.e. the experimental and control groups. The participants

in the study were informed of the research method, confidentiality of the information and the objective of the study and they all entered the study willingly. Diagnostic evaluation based on a descriptive study conducted on a similar target population was done and, based on that, the educational program content was designed. Afterwards, the programs designed for the elderly in the experimental group were implemented during a month and the individuals were followed for two months.

The implementation of the educational program

The main educational method in this study was using the approach of adult education. For this purpose, the participants were divided into five fifteen-individual groups (smaller groups). Based on the interviews with the elderly, it was known that writing education was less favorable to them. Therefore, face to face education and short discussion sessions were selected as the main educational approach in the present study. In line with this, six sessions were held during one month (two sessions a week on Mondays and Wednesdays at 10 to 10:45) at East Ahvaz Health center by the teacher and two teacher assistants. The syllabus in each educational session was selected based on the findings of descriptive studies ad stronger predictors and was as follows: the first session: physiological changes in the elderly; the second session: the complications resulting from self-medication in old age; the third session: perceived vulnerability to the physical and mental complications, being dependent on others and the reduction of mental ability; the fourth session: perceived severity of mental disorders, drug resistance, financial problems, death possibility; fifth session: self-efficacy in the lack of self-medication using verbal persuasion regarding the lack of being ashamed to tell the physician about one's physical and mental problems ; persuading to tolerate the crowdedness of medical centers by reciting prayers and poems or by being accompanied with friends and family (trusted and favored individuals), verbal persuasion regarding the importance of visiting physicians and monitoring body's status in the old age with the aim of preventing affliction with diseases or disease progress, verbal persuasion regarding the fact that paying health costs is not waste of money, rather, it is investment in health. Sixth session: this session was considered for answering the participants' questions. It should be pointed out that the educators used white robes with the aim of creating more impact and gaining more attention.

Also, a phone number was considered for answering the participants' questions for twenty four hours each day for two month after the end of the educational sessions. In addition, two pamphlets titled "self-medication in elderly" and "pharmacotherapy in elderly" were prepared at the beginning of the course and given to the participants. It should be noted that four posters were also designed with the aim of creating medium fear together with the increase of effectiveness regarding the lack of self-medication were designed and placed in the educational environment till the end of the educational course.

Data collection

The data collection tool in this study was written questionnaire and the information was collected by interview with the participants. The questionnaire was consisted of two sections. The first section was dedicated to background and demographic information and was consisted of five questions on the participants' personal information that explored information such as age (years), sex (male, female), marital status (single, married, widowed), education level (illiterate, elementary, middle school, diploma, university education) and the history of self-medication in the past month during the study (yes, no). The second section was related to protection motivation theory constructs for which a standard questionnaire (19) was used.

STATISTICAL ANALYSIS

The data analysis was done using the statistical software SPSS version 16 and by employing chi-squared test and t-test.

RESULTS

Before the implementation of the educational program, the experimental and control groups were explored in terms of demographic and background variables and no significant difference between the two groups was seen in this regard; the results of this exploration are presented in table 1.

Table (1) comparative study of background and demographic variables in the experimental and control groups

Variable		Experimental group Number (percent)	Control group Number (percent)	P-value
age	60 to 65 years	38 (47.5)	42 (52.5)	0.520
	66 to 70 years	23 (48.9)	24 (51.1)	
	71 to 74 years	14 (60.9)	9 (39.1)	
sex	male	16 (55.2)	13 (44.8)	0.535
	female	59 (48.8)	62 (51.2)	
Education level	Illiterate	25 (65.8)	13 (34.2)	0.176
	Elementary	256 (43.9)	32 (56.1)	
	Middle school	8 (36.4)	14 (63.6)	
	diploma	12 (52.2)	11 (47.8)	
	University	5 (50)	5 (50)	
Marital status	Single	4 (40)	6 (60)	0.418
	Married	53 (48.2)	57 (51.8)	
	Widowed	18 (60)	12 (40)	

In addition, the groups were explored in terms of protection motivation theory before the intervention and no significant difference was found in this regard either. As seen from the results in table 2, no significant statistical difference was found between the experimental and the control groups in any of the protection motivation theory constructs (severity, vulnerability, response cost, response efficacy) before the intervention.

Table (2) the statistical indices related to the protection motivation theory constructs in the two groups before the education

Group / Variable	Experimental group (number: 75 individuals)		Control group (number: 75 individuals)		P-value (independent t-test)
	mean	Standard deviation	mean	Standard deviation	
Perceived severity	24.76	4.76	25.03	3.85	0.679
Perceived vulnerability	15.82	3.22	16.62	3.53	0.150
Perceived response cost	14.76	2.49	15.08	2.73	0.455
Perceived response efficacy	24.41	3.14	24.77	2.62	0.448
Perceived self-efficacy	16.34	3.95	17.10	3.77	0.231
Perceived reward	12.33	4.32	13.20	4.22	0.216
Perceived fear	13.78	2.51	14.02	2.08	0.525

Table 3 shows the mean change coefficients for protection motivation theory constructs that have been obtained by subtracting pre-intervention scores from post-intervention scores. The results in this section show that the educational program has been effective in increasing the mean scores of perceived vulnerability, perceived severity and perceived fear in the elderly in the experimental group.

Table (3) comparative study of protection motivation theory constructs in the experimental and control groups before and after the intervention

time Variable and group		Before the intervention Mean (standard deviation)	After the intervention Mean (standard deviation)	P-value
Perceived severity	Intervention (number:66 individuals)	24.50 (4.84)	26.19 (2.16)	0.020
	Control (number: 59 individuals)	24.86 (4.00)	24.93 (3.18)	0.900
Perceived vulnerability	Intervention (number:66 individuals)	15.89 (3.27)	17.57 (2.53)	0.001
	Control (number: 59 individuals)	16.89 (3.09)	16.50 (2.66)	0.452
Perceived response cost	Intervention (number:66 individuals)	14.75 (2.50)	14.54 (1.46)	0.578
	Control (number: 59 individuals)	15.01 (3.00)	15.52 (2.29)	0.674
Perceived response efficacy	Intervention (number:66 individuals)	24.04 (3.02)	24.90 (1.53)	0.064
	Control (number: 59 individuals)	24.66 (3.48)	24.93 (3.48)	0.594
Perceived self-efficacy	Intervention (number:66 individuals)	16.40 (3.84)	17.04 (2.36)	0.263
	Control (number: 59 individuals)	17.27 (4.11)	16.91 (2.26)	0.551
Perceived reward	Intervention (number:66 individuals)	11.54 (3.77)	12.75 (4.41)	0.081
	Control (number: 59 individuals)	13.38 (4.10)	13.03 (4.13)	0.566
Perceived fear	Intervention (number:66 individuals)	13.87 (2.37)	14.65 (1.93)	0.042
	Control (number: 59 individuals)	14.18 (4.10)	13.71 (2.04)	0.244

Table 4 shows the level of self-medication before and after the educational intervention. Considering the findings, although the self-medication has been reduced after the educational intervention, the change is not significant.

Table (4) history of self-medication before and after the educational intervention in the two explored groups

Time	Before the educational intervention		After the educational intervention	
Group	no Number (percent)	yes Number (percent)	no Number (percent)	yes Number (percent)
Experimental	44 (58.7)	31 (41.3)	56 (84.6)	10 (15.2)
Control	48 (64)	27 (36)	43 (72.9)	16 (27.1)
Before the educational intervention $\chi^2 = 0.450$, $P_{value} = 0.502$ After the educational intervention $\chi^2 = 2.708$, $P_{value} = 0.100$				

DISCUSSION

Considering the harmful consequences of self-medication in the elderly, the necessity of planning and creating preventive interventional strategies is clear. Therefore, the present study was conducted with the aim of designing, implementing and evaluating the educational program of self-medication in the young elderly in Ahvaz based on the protection motivation theory.

The findings of the present study indicated a significance increase in the mean scores of perceived vulnerability, severity and fear of the

possibility of being afflicted with the complications of self-medication and seriousness of these complications in the group which in turn indicates the positive impact of the presented educational program in this regard. In this regard, different studies have also pointed out the usefulness of offering educational classes in the improvement of perceived severity and vulnerability of the self-medication complications among the participants which are in line with the findings of the present study (20, 21). For example, Niksadat et al, in their study conducted with the aim of determining the impact of a health-belief-model-based education on the improvement self-medication preventive behaviors on the women covered by health centers in district 3 of Tehran, reported that the mean scores of perceived vulnerability and severity in the participants had been increased significantly after the education, compared with before the education (20). In another study, Shamsi et al explored the impact of education, on the basis of health belief model, on self-medication in mothers in the city of Arak. The findings of their study indicated that the interventions were able to have a significant impact on the increase of means scores of perceived vulnerability and severity in the experimental group (21). These findings can mean that when an individual sees himself as vulnerable against a harmful health threat and feels at risk, he will have fears and will resort to protective actions. It seems that presenting educational content regarding the serious and significant complications of self-medication in the elderly can be useful in the improvement of their perceived vulnerability, severity and fear and can finally result in appropriate healthy behaviors.

The findings of the present study indicated that the educational did not have a significant impact on the improvement of self-efficacy in the participants. In this regard, Niksadat et al reported in their study that their intervention resulted in the improvement of the mean score of self-efficacy for prevention of self-medication and their result is not consistent with the findings of our study (20). Also, the results of the study by Nieto-Vázquez et al on osteoporosis in women verified the hypothesis that educational interventions result in the improvement of health perceptions regarding osteoporosis but no significant increase in perceived self-efficacy score was found (11). Of course it should be pointed out that their study was conducted on women visiting health centers who have a lower age and they may be more influenced by the program. This shows the necessity of providing educational programs for prevention of risky behaviors at a lower ages and these programs may be more useful at a lower age. In addition, considering the nature of self-efficacy and its need for practical skills such as self-regulation skills and the like, it seems that its improvement needs more extensive interventions.

Also, the findings of the present study indicated that educational interventions were not able to have a significant impact on the mean scores of perceived response cost, perceived response efficacy and perceived reward among the participants in the study. The results of our study in this regard are not consistent with the results of the studies conducted on healthy behaviors with this theory. For example, in their study with the aim of determining the impact of protection-motivation-theory-based education on preventive behaviors for the harmful impacts of sun exposure in male students, Maseudi et al showed that the mean scores of perceived response efficacy and reward efficacy were significantly increased in the participants, after the intervention (23). Baghianimoghadam et al too reported that their educational intervention had a significant impact in all constructs of protection motivation theory (24). Of course, as pointed out, these studies are conducted on young individuals and one should be cautious in comparing their results with the results of the present study.

Table 20 shows the results related to the effectiveness of the educational program in reducing self-medication. Despite the reduction of self-medication in the elderly in the experimental group, the reduction has not been statistically

significant. This result is not consistent with the findings of similar studies on prevention of self-medication (20, 21). In line with this, Nilsson suggests that designing strategies for the reduction of self-medication is difficult ad requires a high level of accuracy in designing interventions (25). The lack of significant difference in the reduction of self-medication in the preset study can be due to different factors the most important of which, in the researchers' views, is the low number of participants in the study, sample attrition and low number of educational sessions.

Considering limited information on the usefulness of educational interventions and the factors impacting self-medication in the elderly in Iran, the present study can be significant. However, the present study has also some limitations including the collection of data through questionnaire that can be accompanied by a level of error and the participant may not sincerely mention the information. The study was conducted on young elderly and the problems related to collection of data from this age group was also one of the limitations of the present study. Convenience sampling is another limitation of the present study that weakens the generalization of the results. In addition, the present study had 16.7 percent sample attrition and the future studies are recommended to use methods such as rewarding participants and creating more motivation in them to prevent sample attrition so that more appropriate analysis is done on the effectiveness of the program.

CONCLUSION

Considering the usefulness of the present study in improving perceived vulnerability, severity and fear, it seems that employing this approach can have a more impactful role in interventions for the prevention of self-medication in the elderly.

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