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Effect of Self-management Educational Program on Vision-related Quality of Life among Elderly with Visual Impairment

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Abstract

Background: Visual impairment is one of the independent risk factors for falling among the elderly. Functional disabilities caused by vision disorders are the most common problems affecting the quality of life in this population. Therefore, vision self-management program (VSM) may be helpful for patients in reducing impairment and improving the quality of life.

Aim: The present study aimed to investigate the effect of self-management educational program on the vision-related quality of life among the elderly with visual impairment.

Method: This randomized clinical trial was conducted on 57 elderly people in Mashhad, Iran, in 2017. The participants were assigned into two groups of intervention (n=28) and control (n=29). The intervention group received a 6-week VSM as a 60-minute session per week, while the control group underwent the routine education in the clinic. Visual-related quality of life was measured using the 39-item National Eye Institute Visual Function Questionnaire immediately and two months after the intervention to implement home-based intervention. The data were analyzed in SPSS software, version 23.

Results: The mean age of the participants in the intervention and control groups were 66.4 ± 0.7 and 66.1 ± 7.0 years, respectively. The repeated measures ANOVA test showed that the mean score of vision-related quality of life in the intervention group was significantly higher than that in the control group ($P < 0.05$).

Implications for Practice: The self-management education can increase vision-related quality of life and its various dimensions in the elderly with visual impairment. Given that the intervention duration in this study was two months, further studies with longer duration are recommended.

Keywords: Elderly, Self-management, Vision-related quality of life, Visual impairment

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Introduction

Improved living conditions, longevity, and life expectancy have driven the societies toward the elderly phenomenon (1). The elderly population in Iran accounts for roughly 8.2% of the population in this country. The number of this group is expected to reach to more than 25 million by 2050 (2, 3). Aging causes various health problems, such as physical, mental, and intellectual weakness, various diseases, predisposing damages, decreased quality of life, as well as increased need for attention and intensive care pattern (4).

Chronic diseases limit the activities of the elderly through the creation of health, social, and psychological issues, and thereby reduce the quality of life in this population (5). Eye diseases are among the chronic diseases occurring in the elderly period. Functional disabilities are the most common problems affecting the health and quality of life among the elderly resulting in their dependence on others (6). Ophthalmic diseases are the most important causes of elderly hospitalization in Iran; accordingly, about 33% of the elderly need glasses (8).

Among the five senses, visual impairment is the most obvious sensory problem greatly affecting the compliance of the injured person with the surrounding environment (9). The growth of the number of elderly population will result in an unprecedented number of adults with visual impairment (10). Like many problems, impaired visual functions often accompany aging and are increasingly prevalent in the elderly population. When the vision loss becomes apparent, the patients' ability to perform daily activities will be at risk and diminish.

This reduction in performance is associated with illness, death, and socioeconomic burden worldwide (11). The vision loss is one of the most fearsome aging complications. The visual impairment in the elderly is one of the independent risk factors for falling. The old people with visual impairment are more likely to be hospitalized. Elderly people are also at risk of medication misuse, which is associated with an increase in hospital admission (9). Additionally, this disability has a significant impact on the economy of society due to pharmaceutical and non-pharmaceutical costs, non-acceptance of treatment, dependence due to illness, reduced income, and job loss.

The visual impairment can affect the health-related quality of life and cause irreparable damages to individuals, families, and the community, and ultimately lead to long-term admission and even death (12). The people suffering from visual impairment need to have a lifelong examination to monitor the status and response to intraocular pressure-lowering eye drops or other treatments. The spread of knowledge about visual impairment and creation of proper habits may help these patients by reducing their disorder and increasing their quality of life (13).

Based on the literature, the major elderly care problems are associated with the inadequate education of this population. Training is one of the most effective interventions at all levels of prevention. Such training should be based on knowledge and proper recognition of the educational needs of patients (1). Need-based patient education, especially among the elderly, is one of the roles of the nurses. Educational intervention can be considered as an important factor for the promotion of well-being and enhancement of the quality of life among this group (4).

Based on the milestone of qualitative studies, the self-management programs support the individuals to manage their symptoms and illnesses and deal with emotional and daily outcomes associated with a chronic disease. The self-management patterns improve the health outcomes and reduce the health care costs. However, these principles are rarely used in visual impairment services (10). Therefore, the use of self-management educational programs seems to be necessary for the health of the elderly and can improve all aspects of their life (4).

Brody et al. (2005) investigated the self-management of age-related macular degeneration. In the mentioned study, during the 6-month follow-up, the recipients of the program showed reduced emotional distress and better performance (i.e., better quality of life). In a randomized clinical trial conducted by Rees et al. (2015) with the aim of evaluating self-management program for low vision implemented in the low vision rehabilitation services, there was no significant difference between the groups regarding the quality of life, feeling good, compliance with loss of vision, and self-efficacy.

These studies highlighted the need for the development of educational and innovative programs to increase awareness and improve the performance of patients with visual impairment (12). The effectiveness of educational programs as low-cost, acceptable, and almost uncomplicated interventions in the studies performed by Girdler (10), Brody (14), Rees (15), Chien (16), Kwok (17),

and Heidari (18) et al. has been demonstrated.

There are limited studies on the effect of self-management educational program on the quality of life associated with visual impairment in the elderly, based on NEI-VFQ 39 questionnaire (the vision-related quality of life questionnaire) in Iran. Given the high prevalence of visual impairment and its complications in the elderly, the related medical expenses, and the importance of the issue, the present study aimed to examine the effect of self-management education on the vision-related quality of life among the elderly living in Mashhad using the shortened version of the Abbreviated Mental Test (AMT).

Methods

The present randomized clinical trial was conducted on the elderly referring to Khatam al-Anbia Eye Hospital, Mashhad, Iran. Research approval was obtained from the Ethics Committee of Mashhad University of Medical Sciences, Mashhad, Iran. In addition, an introduction letter was obtained from the Faculty of Nursing, and coordination was made with the officials of Khatam al-Anbia Hospital. The participants were diagnosed with visual impairment due to chronic ocular disease examined by a specialist physician. The study population was selected using convenience and purposive sampling methods until the completion of the specified sample size.

First, a shortened version of the AMT or shortened cognitive test for screening cognitive problems was filled for each of the participants who met the inclusion criteria and were willing to participate in the study. The elderly subjects were enrolled in the study after obtaining the cognitive ability score of 7 or over, completing the informed consent form, and recording the demographic data with the aid of a researcher in Khatam al-Anbia Eye Hospital. Subsequently, the participants were randomly divided into two groups of intervention and control.

First, the numbers 0-9 were assigned into the intervention and control groups by drawing. Next, the starting point was selected with closed eyes in the random number table in order to identify the single-digit numbers. In the next step, based on the previous drawing order, the individuals were entered into the control and intervention groups. This method is accompanied by the least bias since the allocation of people to the two groups was performed before the initiation of the study. To this end, numbers 1, 4, 6, 7, and 9 were used for allocation into the intervention group, and numbers 0, 2, 3, 5, and 8 were used for the control group. Prior to the intervention, a pre-test (visual-related quality of life tool) was implemented in both groups; subsequently, the intervention group experienced self-management educational intervention.

The inclusion criteria were: 1) age of ≥ 60 years, 2) moderate visual acuity (i.e., below 6.18-6.60), 3) moderate visual impairment as classified by the World Health Organization (e.g., age-related macular degeneration, glaucoma, and diabetic retinopathy), 4) no history of acute physical or mental disorders and cognitive impairment, 5) cognitive ability of ≥ 7 (in the AMT cognitive impairment test), 6) vision, speech, and hearing abilities to participate in the study, 7) reading and writing literacy, and 8) residence in Mashhad.

On the other hand, the exclusion criteria were: 1) refusal to continue cooperation, 2) absence of more than two sessions from the educational program, and 3) occurrence of any physical or mental disorders during the intervention that stopped the elderly company from attending the meetings.

The sample size was determined using the mean and standard deviation of the total score of quality of life and its five dimensions based on the mean comparison formula with confidence level of 95% and test power of 80%. According to a study conducted by Girdler (10), the sample size was estimated as 25 cases in each group (i.e., 50 subjects in total). Finally, 30 cases were considered in each group regarding the sample loss. However, since no similar study was found on the quality of life dimensions, the final sample size was determined to be 10 cases in each group based on the guidance study. The minimum sample size in each group is 30.

Data collection was accomplished using three questionnaires, namely demographic information form, NEI-VFQ-39, and shortened version of AMT (only for screening cognitive problems).

We used the Persian version of the 25-item questionnaire of vision-related quality of life with the attachment section, which has a total of 39 items. The questionnaire was originally designed by the US NEI in the mid-1990s and can be administered in individual interview or self-administered format to show the effects of visual impairment on different aspects of health-related quality of life.

This questionnaire was psychometrically tested by the research team of Asgari et al. in Iran in 2011, which showed acceptable validity and reliability (19). This instrument has 39 items in two sections, namely main part and appendix. The appendix section can be added to the main part optionally and according to the researcher's opinion, based on the study conditions, or its questions can be replaced.

The questionnaire includes several domains, entailing general vision (2 items), ocular pain (2 items), distance vision (6 items), near vision (6 items), vision-related social functioning (3 items), vision-related mental health (5 items) vision-related role difficulties (4 items), vision-related dependency (4 items), driving (3 items), color (1 item), peripheral vision (1 item), and a general health domain (2 items).

According to the guidelines of the questionnaire, the score of each domain ranges from 0 (the worst) to 100 (the best). The validity of this tool was checked by the face, content, and construct validities. In addition, the reliability of this instrument was examined using internal consistency, rendering the Cronbach's alpha coefficients of 0.7 and 0.86 for all subscales and the subscale of driving and test-retest method ($r=0.99$) (19, 20). In this study, five dimensions of the questionnaire were examined. The other data, which are merely related to the eye and not affected by educational intervention, were extracted from the clinical records of the patients. Finally, its reliability was calculated by internal consistency method using Cronbach's alpha coefficient.

This ten-item questionnaire was first developed by Hodkinson in 1972 and extracted from the 37-item Roth-Hopkins test. Bakhtiyari et al. in 2014 validated this questionnaire in Iran. The AMT questionnaire has the advantage of having a lower dependence on the educational level, compared to other questionnaires, such as Mini Mental Status Examination. The face validity of this tool was determined using two techniques. In the first method, the Persian version of the questionnaire was introduced to the experts in the field of elderly to exert their comments on the expressiveness, clarification, and understandability of the items in the questionnaire.

In the second method, the questions were provided to at least 10 elderly people with a good cognitive status and literacy. They were requested to express their opinions on the expressiveness, clarification, and understandability of the questions. Subsequently, their comments were collected and applied in the questionnaire. Cronbach's alpha coefficient was calculated after removing any item. Cronbach's alpha coefficient (0.76) was used to measure internal reliability. In addition, the test-retest reliability method was used to measure external reliability.

To examine the external reliability, we calculated the degree of consistency between the two measurements performed by one person using the intra-rater method. One point was given for every correct answer. In the end, the total points were calculated. The score of 7.10 in this test creates an appropriate balance between sensitivity and specificity (21, 22).

This questionnaire contains 16 questions for the evaluation of the function and implementation of the education delivered to the elderly at the home-based intervention (HBI) phase. This instrument facilitated the recording of the function, and thereby examination of the vision-related quality of life by self-reporting in quadruple columns assigned to mark each item. Each column in this checklist contained a two-week interval for function recordings.

The validity of this questionnaire was determined by content validity method. After studying the books and scientific publications on the research topic, the relevant forms were adjusted under the supervision of supervisors and counselors and consideration of the corrective opinions of seven members of the Graduate Council and faculty members of the Faculty of Nursing and Midwifery of Mashhad. The finalized forms were used to collect data.

In this study, all samples completed the questionnaires with the cooperation and assistance of nursing experts (especially for those who were unable to read and write). The data were collected by a questionnaire containing the questions of the vision-related quality of life in all three areas, which were asked from the subjects and recorded in the questionnaire. The participants were assured about the anonymity and confidentiality of information. They were required to respond with accuracy and honesty to all information.

Then, the intervention group were subjected to the self-management educational program for people with visual impairment for three months performed in six sessions (i.e., one month for intervention

and two months for the follow-up). These one-hour sessions were executed weekly, together with routine programs of the center through face-to-face manner. The intervention included five steps based on the educational content as follows:

1) First stage (assess): a detailed investigation of the patient's condition was performed at this stage based on examination and interview. Using a health status form for the elderly with visual impairment and previous recorded tests, the patients were examined for the history of exposure to risk factors, contact duration, history of exacerbation or recurrence of symptoms, vision problems, use of medications, sleep pattern, activity, how to use aids for visual impairment, stress and depression, proper role play, and independency. These studies are helpful in assessing the needs and adjusting the behavioral components in the next stages of the model.

2) Second stage (advise): At this stage, based on the examinations of the previous stage, diseases or abnormalities were diagnosed and reported to the patients, health hazards were identified, and the results of failure to control the disease were explained to the subjects. Furthermore, the benefits of changing their behavior and its relevance to the health and control of underlying diseases were emphasized.

3) Third stage (agree): A written agreement was made between the researcher and the patient about the patient's functions. In this regard, according to the conditions of each patient and based on the identified problems, the behavioral goals and appropriate agreement were determined, and a practical program was developed for each of the objectives. The practical programs were registered in form of behavioral goals. The patients were requested to record their functional status on a daily basis for each behavioral goal in the self-reporting manual for three months. During the meeting, the elderly were emphasized to attend the group training session (steps 1 to 3 were performed in the first two sessions).

4) Fourth stage (assist): four group training sessions were held for each patient as once weekly for four weeks using a data projector, as well as discussion sessions of 8-10 people. Each session lasted 45-60 min. The goal was to enhance the awareness of the elderly and practice skills for better adaptation with visual impairments, prevention from events, and improvement of the nutrition manner and its relationship with vision problems, improvement of the sleep, and prevention of stress and depression, maintenance of independency, role play correctly, and exploration of the ways to live happily. The participants were grouped according to basic need assessment in terms of common requirements. Immediately after the end of the intervention, post-test was performed in the intervention group.

5) Fifth stage (arrange): At this stage, a two-month opportunity was given to complete the HBI by the elderly to ensure the correct implementation of the practical programs. The researcher followed up the participants by making daily telephone call in the first two weeks, followed by a weekly telephone call to remind the performance of the practical programs. In order to ensure that the process is properly performed by the elderly, at the same time, the elderly completed a checklist for self-reporting on the received training during the intervention, approved by seven faculty members in nursing. At the end of each month, the checklist was monitored by the researcher and reviewed to be completed again by the elderly if additional information was required. After a two month follow-up, the test was repeated using the vision-related quality of life tool and the scores obtained from the tool were recorded in both groups.

In this study, the content of the self-management educational program was prepared based on a comprehensive elderly assessment. To prevent the exchange of information between the members of the two groups, all subjects in the intervention group were asked to avoid presenting educational pamphlets to the control group or discussing about the lessons learned. In addition, according to the planning, different days were determined for the referral of the two groups. The control group received the routine trainings in the clinic, and then filled out the questionnaires. They were given some gifts to be encouraged to continue cooperation.

In order to observe ethical considerations, the control group were provided with the self-management booklet at the end of the study. This content covered a large part of the elderly functions in terms of the physical, mental, and social dimensions. Then, the two groups were compared regarding the quality of life using statistical tests.

The collected data were transferred into the SPSS (Statistical Package for the Social Sciences) after coding. Descriptive statistics, including measures of dispersion and central tendency, such as mean,

standard deviation, frequency distribution, and charts, were used to describe the characteristics of the participants in each of the groups. The normal distribution of the quantitative variables was determined by Shapiro-Wilk and Kolmogorov-Smirnov tests. The homogeneity of confounding variables in two groups was assessed by independent t-test, Mann-Whitney U test (for quantitative variables), and Chi-square test (for qualitative variables).

The intra-group comparison in terms of the quality of life scores before and after the intervention in both control and intervention groups was performed using repeated measures ANOVA test and Friedman test (for non-normally distributed data). The 95% confidence interval was considered to test the hypotheses in data analysis. The data were analyzed by SPSS, version 23.

Results

The mean ages of the elderly in the intervention and control groups were 66.4 ± 0.7 and 66.1 ± 7.0 years, respectively. The youngest and the oldest elderly were respectively 60 and 82 years old. The results of the Mann-Whitney U test showed no significant difference between the intervention and control groups ($P=0.474$). Other characteristics and related tests, as well as other demographic information, are listed in Table 1.

Table 1. Comparison of socio-demographic characteristics and background information between the intervention and control groups

Variables		Intervention group (n=28)	Control group (n=29)	P-value
Age	Mean±SD	66.4±0.7	66.1±7.0	0.47**
		Frequency (percentage)	Frequency (percentage)	
Gender	Male	20 (71.4)	14 (48.3)	0.07□
	Female	8 (28.6)	15 (51.7)	
Marital status	Married	27 (94.4)	21 (72.4)	0.02
	Divorced	0 (0.0)	2 (6.9)	
	Deceased spouse	1 (3.6)	6 (20.7)	
Educational level	Reading and writing	1 (3.6)	3 (10.3)	0.60□
	Primary school	8 (28.6)	8 (27.6)	
	High school	8 (28.6)	5 (17.2)	
	Academic	11 (39.3)	13 (44.8)	
Variables		Intervention group (n=17)	Control group (n=19)	P-value
Type of diseases	Hypertension	3 (17.6)	0 (0.0)	0.33
	Diabetes	10 (58.8)	11 (57.9)	
	Diabetes and hyperlipidemia	0 (0.0)	1 (5.3)	
	Diabetes and hypertension	3 (17.6)	3 (15.8)	
	Diabetes, hyperlipidemia, and hypertension	1 (5.9)	2 (10.5)	
	Others	0 (0.0)	2 (10.5)	
Variables		Intervention group (n=18)	Control group (n=18)	P-value
Types of medications	Anti-hypertension	3 (16.7)	2 (11.1)	0.90
	Anti-diabetes	9 (50.0)	9 (50.0)	
	Anti-diabetes and hypertension	3 (16.7)	2 (11.1)	
	Anti-diabetes and hyperlipidemia	1 (5.6)	1 (5.6)	
	Anti-diabetes, hyperlipidemia and hypertension	1 (5.6)	0 (0.0)	
	Anti-hyperlipidemia and hypertension	0 (0.0)	1 (5.6)	
	Others	1 (5.6)	3 (16.7)	
Continous of Table 1.				
History of hospitalization	Yes	11 (39.3)	14 (48.3)	0.41□
	No	17 (60.7)	15 (51.7)	
History of receiving another vision rehabilitation	Yes	1 (3.6)	0 (0.0)	0.49
	No	27 (96.4)	29 (100.0)	

program				
Wearing glasses	Yes	20 (71.4)	18 (62.1)	0.45□
	No	8 (28.6)	11 (37.9)	
Main cause of visual impairment	AMD	4 (14.3)	4 (13.8)	0.24□
	Glaucoma	10 (35.7)	4 (13.8)	
	Diabetic retinopathy	9 (32.1)	12 (41.4)	
	Others	5 (17.9)	9 (31.0)	
Intraocular pressure (mmHg)	Left	21.4±1.9	21.5±6.0	0.72*
	Right	20.4±9.5	20.4±9.1	0.99*

AMD: age-related degeneration

□ Chi-square test

* Independent t-test

** Mann-Whitney U test

The intragroup comparison at the pre-test, post-test, and follow-up was accomplished using the repeated measures ANOVA. The assumption of homogeneous covariance of vision-related quality of life scores was significant ($P < 0.001$) at the pre-test, post-test, and follow-up using Mauchly's test; therefore, the assumption of sphericity was not established. The result was corrected degrees of freedom, Greenhouse-Geiser ($P = 0.157$).

The results of the repeated measures ANOVA showed that the mean scores of vision-related quality of life in the participants were statistically significant ($P < 0.001$) in terms of groups and stages of measurement. Among these, the group ($P = 0.03$), unlike time ($P = 0.29$), had a significant effect on the vision-related quality of life score. No significant interaction was observed ($P = 0.14$) between groups and stages (Table 2).

Table 2. Comparison of mean score of vision-related quality of life in the elderly between the intervention and control groups

Mean overall score of vision-related quality of life	Intervention Mean±SD	Control Mean±SD	Test result
Pre-test	62.3±20.7	50.8±24.9	$P = 0.06^*$
Post-test immediately after intervention	63.9±20.9	50.5±24.4	$P = 0.03^*$
Post-test two months after intervention	64.7±21.6	50.4±24.5	$P = 0.02^*$
Difference between follow-up and pre-test	2.4±10.1	-0.3±2.1	$P = 0.02^{**}$
Difference between post-test and pre-test	1.6±7.0	-0.2±0.9	$P = 0.004^{**}$
Difference between follow-up and post-test	0.7±3.7	-0.1±2.6	$P = 0.99^{**}$
Repeated measures ANOVA test results for intra-group comparison	Total effect, $P = 0.000$ Group effect, $P = 0.03$ Time effect, $P = 0.29$ Interactions, $P = 0.14$		

* Independent t-test

** Mann-Whitney U test

*** Repeated measures ANOVA test

Discussion

The present study focused on the evaluation of self-management education effect on the vision-related quality of life in the elderly living in Mashhad using a shortened version of the AMT. As the findings of this study indicated, the mean vision-related quality of life score increased in the intervention group after performing self-management education. However, no such changes were observed in the control group. The findings of the present study are consistent with the results reported in several studies.

Accordingly, in a randomized clinical trial, Brody et al. (2005) assessed the effectiveness of the self-management of age-related macular degeneration in a 6-month follow-up (14). In another study, Girdler et al. (2010) evaluated the effect of self-management program, along with routine program, on health outcomes and participation; they also examined the effect of depression in the pre-test on variable outcomes among 77 elderly with vision loss due to aging (10).

In a randomized clinical trial conducted by Rees et al. (2015), a self-management program for low vision was implemented in low vision rehabilitation services using 153 subjects (93 cases in the intervention group and 60 cases in the control group). In the mentioned study, the intervention group

received an 8-week self-management program, in addition to the routine care. Each session lasted 3 h and was directed by two visual rehabilitation counselors using visual acuity test and interviews before the intervention, and two interviews after the intervention in the follow-up period (i.e., first month and sixth month).

In the mentioned study, vision-related quality of life was estimated by the Impact of Vision Impairment Questionnaire, and other effects of the interventions were evaluated by means of emotional well-being, overall self-efficacy, and adaptation to vision loss tools. The results of the mentioned study revealed no significant differences between the groups in terms of the vision-specific quality of life, emotional well-being, adaptation to vision loss, and self-efficacy at the one- and six-month follow-up assessments. In addition, the univariate and multivariate analyses indicated that the intervention had no impact on outcome measures (15).

The findings of this study are inconsistent with the results reported by Rees et al. This discrepancy may be due to the use of different tools, as well as a longer follow-up period, compared to the present study. According to the literature, self-management education programs have different components, such as diet, exercise, activity-based care, pain relief, prevention of more damage during activity, problem-solving skills, as well as cognitive and behavioral components. The previous studies have considered only three or four of these components. However, the present study attempted to integrate all components into the program to cover the physical, mental, and social areas for the elderly.

In addition, the mentioned educational program has been performed by a team of physicians, opticians, social workers, nutritionists, behavioral therapists, and so forth. Moreover, in the previous studies, no significant role was considered for the nurses. However, the present study was designed with the clinical and educational experiences of the nurses in the health and elderly areas and in line with the policies of the health system of Iran and in cooperation with the research team to provide a new approach to nursing interventions in the country.

All of the discussed studies have been conducted outside of Iran. Therefore, it was necessary to perform the current study due to the limited research on eye nursing interventions, especially in Iran. Moreover, the present study was carried out on the elderly, while the previous ones have investigated the middle-aged people.

Implications for Practice

The results of this study showed that self-management education can affect and improve vision-related quality of life in the elderly with visual impairment. The awareness of the conditions and areas of visual impairment, as well as the way an individual can adapt to the disorder can be effective in general health, social functioning, mental health, dependence, and also improvement of quality of life in relation to the existing disorder. Because one of the elderly nursing roles is education based on the needs of the elderly and special considerations, the educational interventions can be considered as an important factor in raising the quality of life among the elderly (4).

Therefore, considering the effectiveness of self-management education in improving the vision-related quality of life in the elderly, they can be used in educational program. Regarding the fact that these programs are easier to access and more economical for the elderly and the healthcare system, they are recommended to be applied.

Adequate and scientific knowledge about the impact of effective factors on the choice of appropriate education in each community will facilitate the execution of proper interventions by officials and practitioners of different areas, especially healthcare providers, in order to attain the lowest cost, satisfaction, and maximal mental and physical health for the elderly referring to the health centers or those residing in elderly homes.

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Conflicts of Interest

The authors declare that there is no conflict of interest.

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