



The Role of Health Literacy in Reducing Healthcare Costs and Referring to the Hospital among Elderly

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Abstract

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Introduction: Health literacy is the individuals' capability to obtain, process, and understand the necessary health information required for appropriate health-related decisions. Inadequate health literacy is associated with a variety of adverse health consequences and inappropriate use of healthcare services. The present study aims to investigate the relationship between patients' health literacy and treatment costs among the elderly.

Methods: This research was a descriptive-analytical study. The research sample included 1008 main pensioners of the Social Security Organization of Ahvaz. The research instruments were two questionnaires: Test of Functional Health Literacy in Adults (TOFHLA) and Health Services Utilization. The data obtained were analyzed using the SPSS software. Descriptive statistics (frequency, mean, and standard deviation) and analytical statistics (Pearson correlation) with a significance level of 0.5 were used.

Results: This study's findings revealed that more than 80% of the participants have inadequate health literacy. The results also show the inverse and negative relationship between people's health literacy and the number of referrals to health centers, and its inverse relationship with treatment costs.

Conclusion: Improving health literacy reduces the cost of treatment in the health system and increases individuals' welfare and health. This is especially important for the elderly, whose health needs are higher than ordinary people. Social contact points with the elderly should be addressed, including libraries and librarians to educate and promote health literacy.

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Introduction

Through creativity and intelligence, human beings have always sought to improve their quality of life. Meanwhile, the developed and ruling social organization in each country, relying on economic, social, and scientific support, has brought welfare and life expectancy to citizens. A prerequisite for achieving well-being and a healthy lifestyle depends on knowing how to access medical care and people's understanding of health information (1). Health information increases the community's health knowledge and individuals' ability to appropriately and

adequately deal with diseases and increase the welfare of the community. Accordingly, well-being paves the way for the growth and flourishing of individual abilities, social relationships and reducing anxiety and grief. Therefore, the study of factors affecting it, including the impact of health literacy on well-being, is considered by researchers (1-4). Accordingly, libraries and librarians' role in this regard has been considered (5, 6).

Health is one of society's welfare indicators, and considerable budgets are spent for its realization and promotion. However,



these budgets are limited, especially in developing countries, and need to be controlled. Therefore, monitoring health costs and optimizing them were considered a health system concern and management in countries. Various factors, such as per capita gross domestic product (GDP), urbanization rate, and percentage of population 65 years and older, positively and significantly affect health expenditures (7). These factors are essential to the elderly population because, according to statistics, the average cost of treatment for the elderly is three times that of the ordinary person. According to the World Health Organization (WHO) definition, any person over 60 years old is considered elderly (8). In Iran, in the last census of 2016, more than 9% of the population of 80 million people is over 60 years old (more than 7 million people) (9), which are expected to reach about one-third of the country's population until 2050 (10). This population's healthcare increases the number of referrals, the costs of care, treatment, and hospitalization, and imposes a burden on the community's healthcare costs due to their frequent visits. This means the need to pay more attention to medical centers and hospitals, and as a result, increase the cost of care, treatment, and hospitalization (11-13).

One of the factors that can help improve health and reduce these costs is health literacy. Health literacy means access to a level of personal knowledge, skills, and abilities that effectively improves personal and social health through lifestyle changes (1). Health literacy enables a person to understand the information correctly in the process of exchanging health information. Health information is the information used in the continuous process of care from welfare and health to prevention, diagnosis, decision-making and treatment, and self-care before and after illness and treatment. Dissemination of health information and health literacy promotion is one of the areas of librarians' services. They can do this together with researchers and research centers (14) because libraries are among the centers for people to receive health information (15). Accordingly, librarians are among the most suitable individuals for teaching health information literacy (16).

Inadequate health literacy is associated with a variety of adverse health consequences and inappropriate use of healthcare. Studies show that some of these consequences include increased costs of illness and the rate of hospitalization and use of emergency services among people with low skills (17-20). Some previous research has pointed to health literacy's role in improving life quality (20-23). Numerous studies have been conducted in the health literacy area. The relationship between health literacy and the health status of the elderly has been studied in a number of them (24-31). For example, Izadirad et al., using the Test of Functional Health Literacy in Adults (TOFHLA), studied 354 elderly in Isfahan. The results showed that 79.6% of the elderly were inadequate, 11.6% borderline, and only 8.8 % of the elderly had adequate health literacy. Also, people with low health literacy go to the doctor for treatment more than others (32). Research findings conducted on the health literacy of the elderly indicate researchers' emphasis on improving the status of the elderly and, consequently, the need to improve their health literacy. However, the gap in the economic effects of elderly health literacy and the role of health literacy in reducing the cost of treatment in Iran suggests the need for research in this regard. Therefore, the present study aimed to determine health literacy and its relationship with the number of referrals and treatment costs in the elderly and intends to answer the following questions:

1. Is there a relationship between health literacy level and the

age of elderly referring to health centers?

2. Is there a relationship between the level of health literacy and the number of elderly referring to health centers?

3. Is there a relationship between the level of health literacy and treatment costs of elderly referring to health centers?

Methods

The study population consists of the elderly from the main pensioners of the Social Security Organization of Ahvaz. According to the city's annual statistics of the Social Security Organization in 2011, 47,000 people from the pensioner population lived in Ahvaz.

Considering the significant population of this community, the researchers determined the sample size of 1008 people based on $1 - \beta = 90\%$, $\alpha = 0.01$ using NCSS software and in terms of the relationship between the use of health services and health literacy according to the study of Nekoei-Moghadam et al. (33). Questionnaires were distributed and collected in the medical centers affiliated to the Social Security Organization among the statistical population.

The data collection tool was TOFHLA. The questionnaire's reliability was obtained through Cronbach's alpha test with 95% confidence, and its reliability was 0.79 for the numeracy section and 0.88 for the reading comprehension section (24). This questionnaire consists of two sections: reading comprehension and numeracy. The "reading comprehension" section assesses participants' ability to read and understand instructions, and the "numeracy" section assesses the individuals' ability to comprehend and act on physicians' recommendations and health education they provide to patients and their needs. The total score of this questionnaire is 100. Each correct answer to the question in the first section of the questionnaire has one score, and the total score of the person in this section can be between 0 and 50. The second section of the questions is scored based on the standardized scoring table in this section. In this way, the number of correct answers is counted, then, according to the table, the score determined for the respondents is considered. Finally, the health literacy score is divided into three levels: inadequate (scores from 0 to 59), borderline (scores from 60 to 74), and adequate (scores from 75 to 100) (12).

Another research tool of this project to measure the utilization of health services is the "Health Services Utilization" questionnaire, which takes into account the period of the last six months, data such as the existence of the disease in individuals and the number of referrals to health centers (33). This questionnaire's validity and reliability have been confirmed in a study by Mohtasham Amiri et al. in 2011 (34). In the present study, only the number of referrals, which is part of this questionnaire, has been used.

Data were analyzed by SPSS statistical software using descriptive statistics (frequency, mean, and standard deviation) and Pearson correlation test.

Results

One thousand eight questionnaires were distributed among the participants, of which 932 questionnaires were collected. After distributing the questionnaire and collecting it, the questionnaires of people over 60 years old were separated from them as an elderly population, of which 651 questionnaires belonged to people over 60 years old. The mean age of the subjects was 70 ± 8.2 . Out of 651 participants, 110 (16.9%) were women,



and 541 (83.1%) were men. Statistical analysis of data related to the level of health literacy of the participants in the study showed that the health literacy of 574 participants (88.2%) was inadequate, 46 (7.1%) borderline, and 31 (4.8%) adequate.

Findings showed that the age and health literacy level of elderly participants in the test had a significant negative correlation ($p < 0.001$, $r = -0.319$). In other words, as a person moves up in the age range, his health literacy level moves in the opposite direction and decreases.

Based on the data obtained, the average referral of the elderly

participating in the present study was 2.32 times. (Table 2)

There was a significant negative correlation between the number of patients referred to medical centers and their health literacy score ($p = 0.01$, $r = -0.138$), i.e., the lower a person's health literacy, the more the number of referrals to medical centers. This study's findings also indicated a significant negative correlation between individuals' costs for health services and their level of health literacy ($p = 0.013$, $r = -0.09$). This means that the lower the health literacy, the higher the cost of treatment for each health service. (Table 3)

Table 1. Descriptive results based on health literacy variable

Health literacy level	Frequency	Percentage
Inadequate	574	88.1
Borderline	46	7.1
Adequate	31	4.8
Total	651	100

Table 2. Descriptive results based on the referral number variable

Health literacy level	Frequency	Referral number	Mean	SD
Inadequate	574	1367	2.38	1.24
Borderline	46	85	1.84	1.41
Adequate	31	63	2.03	1.81
Total	651	1515	2.32	1.29

Table 3. The correlation coefficient between the referral number and treatment costs with participants' health literacy score

Health literacy level	Health literacy	
	correlation coefficient	P-value
Referral number	-0.138 *	0.01
Treatment costs for health services	-0.09 *	0.013

* $P < 0.05$

Discussion

Health literacy is the amount of individuals' capability to access, process, and understand the necessary health information and services needed to make appropriate health decisions (16). These decisions have an undeniable effect on achieving personal health and relative well-being of the elderly. However, the present study's findings showed that approximately 88% of the elderly who participated in the test, selected from the community of pensioners of the Social Security Organization, have inadequate health literacy. These findings are consistent with the results of many studies that have assessed health literacy in Iran, including Reisi et al. (25) and Mohseni et al. (27), who estimated the health literacy of 79.6% and 52% of the elderly as inadequate, respectively. Kamali also reviewed 17 articles in a review article reporting a wide range of inadequate health literacy in the elderly (26).

Findings demonstrated that with lower health literacy, the number of referrals to medical centers is higher. This point has been proven in previous studies such as Izadirad et al. (32) by stating that the elderly with less health literacy more often refer to doctors. Also, No-Kohan Ahvazi et al. (35), who in their study examined the number of elderly referred to pharmacies under the auspices of the Social Security Organization, emphasized that the number of elderly referred to pharmacies annually is 38% higher than non-elderly people. In the study of Nekoei-Moghadam et al. (33), it has been emphasized that the number of elderly referred more often and their use of health services is high.

Proving the negative relationship between the number of people referring to medical centers and their health literacy is a prelude to proving the relationship between health literacy and medical costs. The lower the health literacy, the more referrals,



which means that the more people who refer to health centers, the more costs are imposed on the responsible organization. In a study by Howard et al. (17), the same relationship has been proven, that is, people with unnecessary referral times incur additional costs for the insurance organization, which is inversely related to people's health literacy. Therefore, determining incentives to control costs, emphasize preventive care, and maintain and improve providers' quality of services to prioritize the provision of services by health systems is essential. Preventive interventions and health literacy promotion can be financially effective and reduce the need for further treatment. This means that it is sometimes necessary for governments to invest, apart from service financing systems, based on individual treatment and rehabilitation, in preventive measures and the health literacy promoting of the whole community (36).

One of the main challenges in the health system field is "living with superior quality," which means that not only is increased attention to life expectancy, but today in the world, "dynamic aging" is crucial (37), and the need for dynamic aging is self-awareness in the face of diseases and risks that health literacy is the starting point.

Conclusion

Health information generally increases the community's health knowledge and, consequently, the quality of life, so when dealing with the disease, health information helps the patient experience less anxiety. For this reason, the person is more capable of dealing correctly with diseases. This ability allows them to participate in healthcare programs and have more health and well-being, maintain their independence in daily activities, and visit health centers less often when unnecessary. Reducing referrals to medical centers will reduce the overall costs of the treatment system. Besides, it enables savings to be spent optimally, especially in developing countries that face permanent deficits in budgets, equipment, facilities, specialized and non-specialized staff. Therefore, by reducing the treatment burden imposed on medical centers, it is possible to improve the quality and technical level of services.

Lack of adequate health literacy is especially crucial

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