

Health literacy training for diabetic patients and the role of public libraries: A quasi-experimental study

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Abstract:

Objective: Public libraries play a pivotal role in promoting health literacy by providing particular services to their clients. People with inadequate health literacy have poor health performance. Diabetes is regarded as one of the most common diseases among the developing countries. Training diabetic patients via public libraries can promote health information. The present study aimed to investigate the effect of improving health literacy among diabetic patients who are members of a public library and to determine the relationship between the patients' health literacy level, age and gender.

Methods: This is a quasi-experimental study comparing results before and after intervention. The population included 48 diabetic patients as the members of a famous public library in Tehran. A validated Iranian adult health literacy questionnaire was used for data collection and the research was conducted based on direct and indirect intervention. Paired sample t-test and chi-square test were used for data analysis.

Results: The results indicated that health literacy training could play a significant role in enhancing the health literacy level of diabetic patients. Furthermore, there was no significant relationship

between health literacy level and age. Finally, the diabetic patients' health literacy level increased in both males and females following the intervention.

Conclusion: *As citizenship training is considered as one of the main responsibilities of public libraries, using educational capacities available in the public libraries for health literacy can result in promoting social health level.*

Practice Implications: *The role of public libraries in promoting health literacy was clarified. Public libraries can provide a range of health education services for adults.*

Keywords: Health literacy, diabetic patients, public library, training, patient education

1. Introduction

In many countries, public libraries are regarded as one of the centres playing an important role in developing health awareness among individuals. The public library is a local centre for presenting information and providing all types of knowledge and information for users. In addition, public libraries can set the ground for updated healthy problems and health requirements for different people in the society. As a service institute, the public library is an accessible place to everyone and plays a key role in collecting, organizing, and providing access to information resources, which are the reasons why public libraries have a role in promoting health literacy in the community. In other words, health literacy is regarded as one of the most important problems which can be improved by using the capacity of public libraries [1–4].

Health literacy is defined as the amount of individual capacity for acquiring, interpreting and understanding primary information of health services, which is necessary for proper decision-making [5–8]. In other words, as Finset and Lie said: “In a narrow sense health literacy denotes the ability to read health related materials, while in a broader sense health literacy includes a number of abilities related to the acquisition and application of health-related information” [9]. Based on the World Health Organisation (WHO) report, people lacking the skills related to health literacy have poor health performance, poor control and prevention, limited self-care skills and ability to understand health recommendations, remain in hospital for a longer time and thus must pay higher treatment costs [10].

The concept of health literacy was first introduced in developing countries in the 1960s and 1970s in order to promote habits of healthy living. Subsequently, a specific framework was determined for the concept, including functional, interactive and critical levels [11].

Currently, health literacy plays a very important role in developing countries, and several programs and plans have been implemented in this direction. For example, the US Health and Human Service Department has designed and implemented a national plan for improving health literacy, which aims to work with various organizations, experts, politicians, societies, individuals, and families to improve different aspects of health literacy [3]. If health literacy is assumed as a set of skills, empowerments and capacities for acquiring, understanding, processing, interpreting and applying such health information, this set of skills can be regarded as a basis for measuring health literacy [5]. Health Literacy for Iranian Adults (HELIA) is one of the newest instruments for assessing health literacy in Iran; it was derived from the “Test of Functional Health Literacy in Adults (TOFHLA)” questionnaire. Recently, it has attracted a lot of attention because it offers a way to measure different dimensions of health literacy comprehensively. As the validity and reliability of this questionnaire were confirmed in Iran, it was selected for measuring health literacy in the present study [12].

It is worth noting that 60% of all deaths around the world result from non-communicable diseases and the prevalence of such diseases is increasing based on recent statistics [13]. The loss caused by such diseases and heavy costs of health systems are strong motives for designing and implementing predictive programs in different levels. Among such diseases, we can refer to diabetes as one involving disabling complications, and which is highly prevalent in many societies, especially among the developing countries [14,15]. Based on an International Diabetes Federation (IDF) report:

Country	Prevalence (%) adjusted to				Number of adults with diabetes (000s)		Mean annual increment (000)
	World population		National population				
	2011	2030	2011	2030	2011	2030	
Portugal	9.5	11.5	12.7	15.2	1021	1201	9
Romania	7.7	9.0	9.2	11.1	1506	1709	11
Russian Federation	9.7	11.5	11.5	13.9	12,593	14,113	80
Serbia	7.7	9.0	9.3	10.5	671	752	4
Spain	6.3	7.8	8.1	10.6	2840	3932	57
Sweden	4.2	5.0	5.7	6.1	386	433	2
Turkey	7.9	9.4	7.4	9.5	3502	5921	127
Ukraine	2.9	3.3	3.5	4.0	1196	1208	1
United Kingdom	5.2	6.2	6.8	7.5	3064	3646	31
Uzbekistan	6.4	7.7	5.0	6.8	813	1547	39
MENA							
Afghanistan	7.6	8.6	6.0	6.2	818	1649	44
Algeria	6.9	7.7	6.3	7.6	1435	2351	48
Egypt	16.6	19.1	15.2	17.8	7323	12,374	266
Iraq	9.1	10.4	7.2	8.0	1089	2334	66
Islamic Republic of Iran	11.1	12.8	9.3	13.1	4695	8384	194
Morocco	6.8	7.9	6.4	7.8	1268	2035	40
Pakistan	7.9	8.9	6.7	7.8	6349	11,408	266

Fig 1: Prevalence of diabetes and estimated diabetes numbers among adults aged 20–79 years for the years 2011 and 2030: 80 most populous countries [13]

It shows that during 2011-2030, the prevalence of type 2 diabetes in Iran is estimated as 11.1 and 12.8 (adjusted to the world population), 9.3 and 13.1 (adjusted to national population) and 4,695 and 8,384 (adjusted to the number of adults with diabetes), respectively¹ [13]. Therefore, the number of diabetic patients is increasing in Iran and the effect of age and gender on diabetic people has been previously reported [16–23]. Regarding the above-mentioned problems, it is evident that adequate information about the prevention of diabetes is considered as one of the factors influencing the prevention and control of this disease [1–4]. Furthermore, providing training in health literacy via public libraries, which are considered as the trustees of citizenship education among different societies, is an influential factor for the level of information, more effective control and prevention of diabetes is. Previous studies have been conducted on the significance and performance of health literacy education [24–26] although, to the best of our knowledge, no research has been separately carried out on the educational role of public libraries in promoting health literacy levels. Therefore, the present study aimed to study the status of health literacy among diabetic patients referred to the public library of the Andisheh Cultural Center in Tehran, Iran by using the HELIA questionnaire, which could evaluate the selected patients' health literacy before and after intervention both formally and informally. The relationship between the patients' health literacy level, age and gender were also explored in the present study. Finally, the role of public libraries in the process of exploration, value and place of such libraries in promoting health culture was clarified.

¹ Mean annual increment (000s) is 194

2. Method

2.1. Population and sample

The present study is a quasi- experimental study (before and after intervention). The statistical population included all diabetic patients who were the members of the Andisheh Cultural Centre Public Library and registered for educational classes during April - November 2015. Participants were selected through an announcement entitled “Better life with diabetes” in the library. Participants registered voluntarily for these classes and signed the consent letter. Fifty-two participants were selected for the pilot study (6.5 mean difference questionnaire score before and after intervention, with 0.05 significance level and 80% power and 10% dropout). 4 persons were missed to follow up. We therefore analysed data for the remaining 48 participants.

$$n = \frac{1}{1-f} \frac{(z_{1-\frac{\alpha}{2}} + z_{\beta})^2 (s_d)^2}{d^2} = \frac{1}{1-0.1} \frac{(1.96 + 0.84)^2 (7.35)^2}{(3)^2} \cong 52$$

$$52-4=48$$

2.2 Instrument

The HELIA questionnaire was used for data collection. The validity of the questionnaire was confirmed by 15 experts in different fields of medical science and reliability of the questionnaire, with a reported Cronbach' alpha between 0.72 and 0.89 [11].The questionnaire included 33 items with five different areas such as access (6 items), reading skill (4 items), understanding (7 items), evaluation (4 items), decision and application of health information (12 items) and measured the health literacy of the sample before and after direct or indirect intervention. The scoring ranged from 0 to 100. Regarding the score interpretation, health literacy is considered poor for scores between 0 and 59, borderline for the range of 60 to 74, and satisfactory for scores of 75 or above.

2.3. Intervention

Both direct and indirect interventions were conducted in four two-hour sessions over 45 days. First, the questionnaire was distributed and collected among the participants. Then, they were exposed to direct training from the head of Iranian diabetic association. They were familiarized with some information about the ways for controlling diabetes, changing lifestyle, increasing physical activity, receiving intensive training in diet, and behaviour modification. During the second session, held two weeks later, participants were trained indirectly and were familiarized with educational materials such as brochures, pamphlets and educational booklets, and the related websites required for diabetic patients which were selected and prepared by librarians' and experts' consults in this field. Finally, during the last session, participants were trained based on a direct method of intervention, like the first session, in which the patients obtained information about self-care, and reading and interpreting some health texts, related to their condition. The questionnaire was distributed among the participants at the end of the last session.

2.4. Data analysis methods

The data were analysed by using SPSS version 18. Data were described with mean \pm SD (for continuous data) and frequency/percent (for categorical data). The Kolmogorov-Smirnov test of normality was applied, and a paired sample t-test and chi-square test were conducted.

Finally, correlation between variables was measured by Pearson correlation coefficient. A p-value below 0.05 was considered as the significance level.

3. Results

- 3.1. In the present study, 48 patients among the public library members with mean age of 54.62 ± 10.61 year were included (22 males vs. 26 females).
- 3.2. Among the sample, three individuals had a high school degree (6.25%), two had a primary degree (4.17%), seven had a diploma degree (14.9%), five had an associate degree (10.42%), eighteen had a BA degree (37.5%), ten had an MA degree (2.1%) and two had a PhD (4.17%).
- 3.3. A frequency analysis of job situation shows that the highest frequency associates with students (25 persons (52%)) followed by retired individuals (12 persons (25%)), unemployed individuals (7 persons (15%)), and housewives (4 persons (8%)).
- 3.4. Some participants had experienced more than one resource of information. Thus, 24 participants (28.24%) obtained health information from doctors and the health personnel, 37 (43.53%) through using Internet, radio, and television, 17 (20%) based on educational brochures and pamphlets, journals and magazines, and 7 (8.23%) by asking friends.
- 3.5. The mean score of the health literacy level before intervention was 72.45 ± 9.99 which increased to 79.85 ± 10.22 (p-value < 0.001) after intervention. The mean score difference before and after education was 7.40 ± 10.50 (- 12.5-38.12).
- 3.6. Among the selected samples, 23% of females had borderline health literacy while 77% had adequate health literacy. Regarding the males, 19% had borderline health literacy while 81% had adequate health literacy. Generally, 79% of participants had adequate health literacy while 21% had borderline health literacy.
- 3.7. There was no significant relationship between health literacy score and the patients' age ($r = 0.379$; $p < 0.001$).

Table 1: A comparison of mean score in health literacy before and after intervention based on gender

	Female	Male	P-value
Health literacy score before intervention	72.43 ± 10.42	72.47 ± 9.8	0.989
Health literacy score after intervention	79.69 ± 10.24	79.99 ± 10.41	0.920
Health literacy difference score before and after intervention	7.26 ± 10.83	7.52 ± 10.43	0.932

In addition, no significant relationship was discovered between health literacy and gender among the patients ($p < 0.001$).

4. Discussion and Conclusion

- 4.1. Discussion: Public libraries can play an important role in offering reliable information to patients and promoting health literacy in the community. The principle mission of public libraries, especially in the digital age, is to provide different accessible types of information to society [27]. Public libraries can extend healthy life styles and promote health literacy through their educational role. The results of the present study, like other similar studies, indicate that patient education is very effective in increasing the health literacy of patients [11, 28–34]. The results are especially important for diabetes which has been recognized as the most prevalent disease of the century [35–37]. In many previous studies, the research setting was hospitals and clinics. However, the library has not been used as the setting in any of the studies conducted in this area although library space, compared to hospital, play a positive role for education. In the hospital, people are placed in a context related to illness and disease, while in the library they feel more relaxed.
- 4.2. In the present study, the intervention was implemented directly and indirectly, which was different from many previous studies. Those referred to the library obtained information about training methods and self-care (via educational pamphlets) in educational workshops and places other than workshops such as at home, the workplace, while commuting and so on. It seems that studying pamphlets before attending workshops prepared participants to accept the materials referred to in the workshop. If we believe in the capabilities of public libraries in promoting culture and levels of public literacy, such social institutions can be easily used for public training. It is important to focus on training self-care behaviours, control and informed prevention, especially with regard to diabetes. It is more efficient to promote patients' health literacy by leveraging all the advantages of public libraries, although it should be noted that there were some difficulties during the present study, such as identifying and explaining the goals to the participants, holding regular classes based on their time-table, and preparing appropriate and accurate outline for the related intervention session. Therefore, ongoing patient education can reduce the risk of long-term complications [38].
- 4.3. Conclusion: Politicians concerned with health and health education can use potential facilities of public libraries, achieve the goals determined in their programs, and set the ground for health promotion in society.
- 4.4. Practice implications: The role of public libraries in the promotion of health literacy was clarified. Such libraries can provide a range of health education services for adults.

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