Health Education and Health Promotion (HEHP) (2015) Vol. 3 (4)

Assessment of Designed Pamphlet of Osteoporosis Knowledge of Girl Students

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Abstract

Aim: The importance of osteoporosis is on its relationship with disability, mortality, adverse effects on quality of life, and also the imposed costs on individuals and society. Osteoporosis begins in early adolescence. Therefore, educational programs should begin at an early age. The present research evaluated the effect of designed pamphlet on the knowledge of female seventh grader students in city of Andisheh, Shahriar County, Iran.

Method: This RCT (Randomized Clinical Trial) study included experimental and control groups, each 70, which were attributed randomly. All participants completed the knowledge part of the questionnaire as pre-test. Then the experimental group received designed osteoporosis pamphlets, and post-test was carried out two months after the intervention, which was conducted on Jan 2016. The collected data were analyzed using SPSS 21.

Findings: The studied groups were similar in terms of demographic characteristics such as educational background, age, job and income. The results of paired t-test showed a significant difference before and two months after the intervention ($p<0.001$). Independent t-test showed a significant difference between the two groups (≤ 0.001) after two months.

Conclusion: Pamphlet as an educational tool has a significant effect on the knowledge of osteoporosis on seventh grade girl students. Therefore, being easy and cost-effective, this educational tool can be put on the top priorities of educational interventions.

Keywords: Pamphlet, Osteoporosis, Knowledge, Girl students

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Introduction

Because of increasing prevalence rate worldwide, osteoporosis is a serious and silent public health problem. It is estimated that the number of hip bone fractures will increase six times from 1990 till 2050 that is a critical public health issue [1]. The importance of this disease relates to its association with disability, mortality, adverse effects on quality of life, and also very heavy costs imposed on individuals and society [1].

Osteoporosis effects on the health of many people, especially women silently. As defined by the World Health Organization (WHO), it is bone density decrease at 2.5 standard deviation below the mean for young healthy adults of the same race and sex (score <T-2.5) [2].

Osteoporosis begins in early adolescence. Throughout childhood to 20 years of age, bone formation exceeds bone desorption, but after age 30. Educational program may increase preventive behaviors in younger adults to decrease the chance of osteoporosis in their later life.

Peak bone mass is reached around the age 30, after which bone loss starts slowly. In other words, peak bone mass is formed early in life to late adolescence or early twenties [3, 4]. The WHO declared the period 2000 to 2010 *the decade of bone joint diseases* such as osteoporosis [5]. It also announced that osteoporosis is the fourth main problem of public health after myocardial infarction, stroke, and cancer, and the most important cause of bone fractures in the world [6]. Women suffer more from bone loss today than in the past decade. This is probably due to decreased physical activity, low calcium intake, and smoking [7].

Statistics show that women are four times more likely to develop osteoporosis than men [8]. Osteoporotic fractures are among the most important consequences of this disease [9]. Osteoporotic fractures cause loss of independence in performing daily activities and reduce the ability of the individuals [10].

Loneliness, isolation and subsequent reduced self-confidence and depression, and ultimately, lower quality of life are other consequences of osteoporotic fractures [11, 12]. Larijani et al. (2005) found that about 50% of men and 70% of women over 50 years are suffering from osteopenia and osteoporosis at the national level [13].

The costs associated with osteoporosis-related fracture treatment in America are equivalent to cardiovascular diseases treatment costs, and even research has shown that osteoporosis increases the length of inpatient stay more than heart attacks and breast cancer [14]. Almost about 1.6 million osteoporosis-related fractures occur worldwide every year, and this number will reach 4.5 to 6.3 million by 2050 [15].

It is also important that the risk of death from

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osteoporosis in a woman's lifetime is equal to the breast cancer death rate and about four times of the cervical cancer death rate [16]. WHO estimates that about 530 million people will be older than 65 years in Asian countries by 2050, and osteoporosis will become one of the most important health problems in this continent due to increased life expectancy and risk factors such as changes in eating pattern, low of vitamin D and calcium intake, and lack of exercise. Considering the rising of average age of the Asian population, it has been estimated that about 50% of all fractures caused by osteoporosis will occur in Asia by 2050 [17]. It is predicted that by 2050, Iran will account for 0.85% and 12.4% of the burden of hip fractures in the world and in the Middle East region, respectively [18]. The important issue is that there are many methods to prevent osteoporosis. Osteoporosis is a preventable disease, and many fractures can be prevented largely by a combination of lifestyle changes and appropriate medical treatment [7]. With regard to risk factors affecting the development and progress of osteoporosis, it can be claimed that this disease forms in childhood and occurs in older people, because the most important factors affecting its development are related to lifestyle, which is formed during adolescence [17]. As a result, early adolescence is the best age for the prevention of osteoporosis, and it would be better to implement training programs in this period [19].

Considering the benefits of pamphlets, including ability to review contents, providing materials appropriate to the level of education and knowledge of different target groups, low cost, ability to be reproduced and distributed among a large number of people, and saving time and manpower, especially in hard circumstances, in when we are facing shortage of personnel, this method can be an appropriate training method by observing standards in providing the training package [20].

Method

This RCT (Randomized Clinical Trail) was conducted to evaluate the effect of the pamphlet on knowledge of female seventh grader students of osteoporosis. This intervention was conducted on Jan 2016. Target population was female seventh grader students in the city of Andisheh, Shahriar County, Iran.

Inclusion criteria included 1) being seventh grader level girl student, and 2) lack of a disability to answer questions. And exclusion criteria included 1) unwillingness to participate, and 2) being absent or transferred student. The subjects included 140 seventh grade female students who were randomly assigned to the experimental and control groups. To determine the sample size, we

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applied $N= 2 (Z_1 + Z_2)^2 \times S^2 / d^2$, with considering 1 percent for drop-outs or non-participation, which led to an optimal sample size of at least 70 in each group.

95% confidence level (CI) and 80% power of the test were used. The variance of the intended attribute was also used from previous studies [21]. Standard demographic and knowledge questionnaires on osteoporosis were used for data collection [21].

The demographic questionnaire included family size, age, occupation, parent education and income level of the families.

The knowledge questionnaire included 24 multiple choice questions to assess the students' level of knowledge about the risk factors associated with bone loss and the factors affecting its prevention. Scores zero, 1 and 2 were assigned to "false", "I do not know" and "correct" options, respectively.

The pretest was implemented after initial coordination with the education departments and schools and obtaining the students' consent. Then, based on the literature review and the results of pre-tests, as an educational needs assessment, the educational contents were defined. Next, the pamphlet was designed based on the contents and the students' age group. The pamphlet contained materials about osteoporosis, symptoms, complications, risk factors and the role of preventive behaviors.

Content validity of the pamphlet was assessed by four specialists, and their comments were considered. The amended version of the pamphlet was distributed in the experimental group two weeks after of the pretest, and the control group received no intervention. The post-test was carried out two months after pamphlet distribution. The collected data were analyzed using SPSS21, Chi-square test, and paired t-test for the difference before and after intervention, and independent t-test to assess the significance of the differences between the two groups. Also, in the order to comply with research ethics, the control group was given the pamphlets after collecting the data in the second step.

Findings

The results showed that the average age of the students was 13 years and overall average of the family size consisted of 4 persons. In terms of education level, 41.8% of the fathers and 55.2% of the mothers were high school graduates.

In terms of job frequency, 47.8% of the fathers and 89.5% of the mothers were self-employed and housewives, respectively.

A total of 70.2% of the family income was classified at a good level (covering living expenses).

The results of Chi-square test showed no significant difference between the

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experimental and control groups in terms of the mentioned demographic variables.

Table 1: Demographic characteristics of the students in both groups

		Experimental group	Control group	P. value
Family size		X±SD	X±SD	0.94
		4.25 ± 0.704	4.24 ± 0.908	
Father's age		42.72± 4.88	44.21± 7.038	0.149
Mother's age		37.6± 5.167	37.53 ± 6.73	0.947
Father's literacy		**N (%)**	**N (%)**	0.82
	Illiterate	1 (1.5)	2 (2.9)	
	Primary	4 (6)	2 (2.9)	
	Secondary	11 (16.4)	12 (17.1)	
	Diploma	28 (41.8)	29 (41.4)	
	University	23 (34.4)	25 (35.8)	
Mother's literacy	**Illiterate**	2 (3)	1 (1.4)	0.75
	Primary	5 (7.5)	4 (5.7)	
	Secondary	10 (14.9)	11 (15.7)	
	Diploma	37 (55.2)	45 (64.3)	
	University	13 (19.4)	9 (12.9)	
Father's job	**Unemployed**	2 (3)	1 (1.4)	0.93
	Laborer	2 (3)	2 (2.9)	
	Free job	32 (47.8)	35 (50)	
	Employed	31 (46.2)	31 (44.3)	
Mother's job	**Housewife**	60 (89.5)	62 (88.5)	0.86
	Employed	6 (9)	6 (8.6)	
	Laborer	1 (1.5)	2 (2.9)	

Analyzing the results of knowledge of the two groups (experimental and control) before the intervention showed no significant difference (P=0.227), while two months after the education, the difference was significant (p<0.001).

The results of paired t-test showed significant differences before and two months after the intervention in the experimental group. There was a significant change in the experimental group in the mean awareness scores before and after the intervention (P <0.001).

Table 2: Comparing the mean scorers of the students' knowledge in the two groups during the pre-intervention and follow-up phases

	Before intervention	Two months after the intervention	P. value
	Mean ± SD	**Mean ± SD**	
Experimental group	22.76± 4.50	28.49± 6.21	<0.001*
Control group	23.73 ± 4.80	24.97±3.99	0.024
P. value	0.227	<0.001*	

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Discussion

Osteoporosis is a growing global health problem and training programs have been designed as an essential strategy to prevent it [22]. Based on the research results, there was a significant positive difference on the knowledge of the studied students before and after the educational intervention by pamphlet. On the other hand, the significant changes in the control group are attributed to the curiosity of students in finding answers to questions and the role of media and family as well as the effect of the questionnaire itself.

The relevant studies conducted in Iran and abroad had results similar or contrary to the results obtained in this research, including the study conducted by Kamjoo et al. on the awareness level of 480 high school girls in Bandar Abbas (Iran). They reported a significant increase in the students, level of awareness [23]. In another study on 537 high schools girls in Shiraz, Pour Namdar et al. showed the positive effect of education [24] on the knowledge of osteoporosis of the students. Also Ghafari et al.'s study on female middle school students' knowledge level indicated a significant increase in their level of knowledge [25]. In a study on the effect of education on female employees' level of knowledge, Bolbol Haghighi showed a significant difference before and after training [25]. We can also refer to the results of studies conducted by Ebadi-fard Azar and Torshizi [26, 27] to support the current study results. In studies on 307 women, Blalock et al. showed that educational packages caused changes in their knowledge and beliefs but no change was observed in their behavior [28].

Francic et al. conducted a study on 198 women, and indicated a significant increase in the experimental group's level of knowledge and self-management behavior [29]. Another study on women's level of knowledge and prevention of osteoporosis, Shaquille et al. observed significant changes in the experimental group compared to the control group [30]. Gomij et al. stated a significant increase in the experimental group's level of knowledge [31] after educational intervention.

There are some studies, which are inconsistent with the results of the present study. Solomon et al., studying the effect of educational intervention via e-mail on knowledge, attitude and preventive behaviors of osteoporosis, found no difference between the intervention and control groups in terms of level of knowledge [32], which could be due to differences in methods of intervention.

This study had some limitations such as self-report gathering data method, which may have under-estimated or over-estimated results.

Conclusion

Osteoporosis is one of the most common

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public health problems globally, and many training programs have been designed so far as an essential strategy to prevent it, which have imposed huge expenses to the society. On the other hand, it is easily preventable by increasing the knowledge of people in the societies like ours. According to the results of this study, it is recommended to put health education on the agenda through the media, schools and health centers regarding the promotion of individuals' level of knowledge, especially adolescent girls who are at the most priorities of education in the world because of their susceptibility to get the disease.

Acknowledgement

The Vice Chancellor of Research of the university is appreciated for providing financial resources. Also the authors would like to appreciate the sincere help and cooperation of all the participants who kindly spent time filling out the questionnaires, as well as the education authorities of Shahriyar County for their sincere cooperation.

Ethical considerations

This research is part of a PHD dissertation in Tarbiat Modares University, Faculty of Medical Sciences, Tehran, and has been confirmed in the Ethics Committee of Tarbiat Modares University (with the reference number 52D/6584, 2015).

Conflict of interest

No conflict of interest has been declared by the authors.

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