Efficacy of Health Belief Model-Based Intervention for Enhancing Nursing Staff Beliefs Regarding Osteoporosis Prevention at Primary Health Care Centers

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Abstract

Objective: To evaluate the efficacy of Health Belief Model Based-intervention for enhancing post-menopausal nurses' belief regarding osteoporosis prevention.

Method and Materials: A quasi-experimental design is carried out on a purposive "non-probability" sample of (60) post-menopausal nurses , who are attending the primary health care centers in Mosul City. A questionnaire has been developed for the purpose of the study. Content validity and internal consistency reliability for the study instrument are determined through a pilot study. Data are collected with the study instrument and the interview technique as means of data collection The data was analyzed by using percentage, frequency, mean, standard deviation and chi-square.

Results: Finding show participants characteristics, the mean age is 53.467, the age 56- to 60 years old were recorded the highest percentage (43%), Respect to the education level most of post-menopausal nurses were secondary in nursing (70%); and their nursing institute graduate& nursing college graduated (30%), The results demonstrated that the difference was higher among the intervention group than the control group.

Conclusion: The developed osteoporosis education program using the health belief model had a remarkable and significant impact for enhancing post-menopausal nurses' health belief regarding osteoporosis prevention behaviors. The HBM-based intervention seemed more successful in raising participants' knowledge, altering their view of osteoporosis, and inspiring them to engage in preventative behaviors to lower their risk of developing osteoporosis and its effects.

Keywords: Health belief model (HBM) based intervention, osteoporosis prevention, nursing staff

INTRODUCTION

In Iraq, osteoporosis is a common health problem but unfortunately, the real prevalence and socioeconomic burden of the disease are underestimated. Osteoporosis is define by a decrease in bone mass and a change in bone architecture that makes bones more brittle and increases the risk fracture especially of the vertebrae in the spine, bones of the fore-arm, and the hip and wrist, it occurs more in females [1]. It is typically defined in an individual with a reduction in the bone 'T-score' of mineral density (BMD) of ≤ -2.5 according to Dual Energy X-ray absorptiometry (DXA) examination [2].

Over 200 million people are thought to be affected by osteoporosis worldwide. Approximately 1 in 2 women and 1 in 5 men older than 50 years will eventually experience osteoporosis fractures [3]. around the world 50 percent of women and 20 percent of men over the age of 50 are expected to suffer an osteoporosis-related fracture [4]. It is generally found in later age, but it is the result of numerous variables- modifiable and non- modifiable. Bone quality is difficult to quantify. Bone quality is not readily quantifiable. Following the decline of estrogen hormone after menopause in women and testosterone in men, postmenopausal osteoporosis (type 1 osteoporosis) is common condition in female patients following menopause [5].

Calcium is an essential micronutrient which is very pronounced important for bone and teeth health, vitamin D can help intestinal absorption of ingested calcium. In addition to aiding in muscular contraction and protein synthesis in the muscles, vitamin D also

helps to create bones. According to the Ministry of Health's (MOH) 2017 Recommended Nutrient Intake (RNI) guidelines, post-menopausal women must consume 1000–1300 mg of calcium daily. Many studies found that post-menopausal women are at risk of low calcium intake than the recommended value. vitamin D can help intestinal absorption of ingested calcium [6].

Osteoporosis should ideally be prevented starting in childhood, aiming to achieve high peak bone mass accompanied by an inherently healthy lifestyle throughout life, This help to minimize bone loss during middle and old age, and in parallel to avoid or diminish other fracture risk factors. Increasing effective physical activity, quitting smoking, and consuming enough calcium and vitamin D in the diet are the most crucial ways to avoid osteoporosis. The understanding of risk factors and methods to prevent osteoporosis and lower the chance of acquiring the disease in later life can be achieved through prevention education programs extremely effectively [7].

The Health Belief Model (HBM) is a psychological model for changing health behaviors that was created in 1950 by public health professionals in the United States (US) with the goal of transforming human lifestyles toward healthy habits [8]. The HBM has six constructs that explain or predict why people will take action to prevent, control, or screen for a disease; these constructs include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy and was developed in response to the failure of a free tuberculosis (TB) health screening program. Nevertheless, some models and theories have been developed to explain health behaviors. Since then, the Health Belief Model has been adapted to explore a variety of long-term and short-term health behaviors [9].

According to this model, changes in health behaviors and practices are predicted by susceptibility is a belief about the likelihood of receiving a disease or condition. P. severity is a belief about the seriousness of the condition. P. threat is amount of severity and susceptibility. P. benefit is a belief that a certain action will decrease the risk of impact and P. barriers are a belief about the costs of the action. Cue to action (Health motivation) is a motivate to readiness and self-efficacy is one's confidence in the ability to successfully act [10].

Method and Materials:

A quasi-experimental design is conducted to evaluate the efficacy of the HBM to enhancing beliefs among post-menopausal nurses at primary health care from (November 9, 2022 to January 2, 2023). The study was conducted at the primary health care centers in Mosul city. Non- probability, purposive sample of 60 post-menopausal nurses was selected, (30) experimental group, and (30) control group. These groups were chosen according to the age criterion and the criterion of the target sample female nurses who loss menstrual period for 12 months or more and not suffering from chronic disease.

The study data were collected by (Health Belief Model questionnaire to measure beliefs about osteoporosis), it consists of two parts; part one involves socio-demographic characteristics age, marital Status, educational level, socioeconomic status and residential unit. Part two Osteoporosis Health Belief Scale (OHBS) that developed by Kim et al., 1991 and includes a 42-item instrument consisting of seven subscales addressing health beliefs. The subscales address susceptibility, severity (seriousness), benefits of exercise, benefits of calcium intake, barriers to exercise, barriers to calcium intake, and health motivation. Each item was rated by using a 5 point Likert scale with 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. Accordingly, a maximum total score for OHBS was equal to five and a minimum total score was equal to 1. Intervention the researcher conducted a pre-test for study and control groups and then gave the intervention to the study group. After that, the first post-examination was repeated, and then after two months, the second post-test was carried out to assess the extent of the e intervention's efficacy in changing the nurses' belief towards osteoporosis prevention. Data is collected from nurses by interview technique. The data was analyzed by using percentage, frequency, mean, standard deviation and chi-square.

The questioner consists from two parts:

Part I: Socio-Demographic Characteristics: This part deal with nurses' socio-demographical characteristics which included sex items (Age, educational level, marital status, socioeconomic status, educational level, residential unit)

Part II: Osteoporosis Health Beliefs Scale (OHBS): It measure post-menopausal nurse's beliefs about

osteoporosis. The researchers translated it and used it. It comprises 7 subscales related to: Perceived susceptibility & seriousness to osteoporosis, perceived importance of regular exercise & dietary calcium intake, perceived barriers to exercises & calcium intake and Perceived health motivation. It used a 5 – point Likert scale from "strongly disagree" - " strongly agree". Answers were classified and scored by assigning "1" for" strongly disagree" answer and "5"

for "strongly agree" answers. Each scale consists from 6 questions, possible score for each subscale ranged between "6-30" with a low score suggesting low perception and high score indicating high perception. Scale interpretation for the six subscales from (6-18 low perceived, & high perceived 19-30) in relation to perceived health motivation subscale negative view of health 6-18 positive view of health from 19-30). It created and validated by Kim et al., (1991b) [11].

RESULTS

Table 1

The experimental and control groups' demographic variables and homogeneity (N= 30).

Characteristics		Experimental		Control		Total		χ^2
		F	%	F	%	F	%	
Age	45 – 50	8	27%	9	30%	17	28%	**0.650**
	51 – 55	9	30%	11	37%	20	33%	
	56 - 60	13	43%	10	33%	23	39%	
	M (SD)	**53.467 (4.224)**		**53.067 (4.234)**		**53.267 (4.198)**		
Marital Status	Married	20	67%	20	67%	40	67%	**0.843**
	Unmarried	3	10%	4	13%	7	12%	
	Divorced	2	6%	3	10%	5	8%	
	Widowed	5	17%	3	10%	8	13%	
Residency	Rent	12	40%	11	37%	23	38%	**0.071**
	Owner	18	60%	19	63%	37	62%	
The socio -economic status	Less than 200,000	2	7%	1	3%	3	5%	**1.458**
	200,000-500,000	1	3%	0	0%	1	2%	
	501,000-800,000	10	33%	10	33%	20	33%	
	801,000-1,100,000	15	50%	17	57%	32	53%	
	1,101,000-1,500,000	2	7%	2	7%	4	7%	
	1,501,000 or more	0	0%	0	0%	0	0%	
Educational level	Secondary school in nursing	21	70%	18	60%	39	65%	**0.831**
	Nursing institute	6	20%	9	30%	15	25%	

	graduate							
	Nursing college graduate	3	10%	3	10%	6	10%	

F: Frequency, %: Percent, M: Mean, SD: Standard deviation, χ2: Chi-square

Table1. shows that the study participants were 60 post-menopausal nurses between 45 - 60 years old, and the overall mean age for the participants was 53.467 (SD =4.224). Regarding other demographic characteristics, most of the participants for the control group were house owner (63.%). For the Experimental and control group most of participants were (67%) married. There were no statistically significant differences in the baseline demographical characteristics between the groups (Table 1)

Table 2

Descriptive Statistics Measuring Change in Health Belief Model Concepts, Across Study Group.

variable	The study Group											
	Experimental (n=30)						Control (n = 30)					
	Pre test		Posttest 1		Posttest 2		Pre test		Posttest 1		Posttest 2	
Osteoporosis Health Belief Scale	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Perceived susceptibility	2.40	1.16	3.43	1.17	3.90	0.48	2.13	0.94	2.43	1.22	2.33	1.12
Perceived Severity	2.50	1.25	3.60	1.16	4.40	0.56	2.37	1.27	2.77	1.25	2.90	1.12
Perceived Benefits of Exercise	2.60	1.28	3.70	0.60	4.00	0.45	2.77	1.41	2.17	1.21	2.60	1.54
Perceived Benefits of calcium intake	2.33	1.32	3.83	0.46	4.00	0.37	2.17	1.34	2.57	1.25	2.83	1.34
Perceived Barriers to exercise	2.57	1.22	3.87	0.35	3.90	0.40	2.57	1.38	2.57	1.38	2.73	1.28
Perceived Barriers to calcium intake	2.43	1.33	3.43	0.90	3.87	0.43	2.57	1.28	2.63	1.47	3.03	1.38
Health motivation	2.33	1.06	3.53	0.73	3.87	0.43	2.53	1.11	2.33	1.37	2.50	1.33
total	2.45	0.31	3.63	0.36	3.99	0.28	2.44	0.36	2.50	0.44	2.70	0.46

HBM: Health Belief Model, Ex: Experimental group (n = 30), Co: Control group (n = 30), M: mean, SD: Standard Deviation, Minimum beliefs score = 1, Maximum beliefs score = 5

Table (2): indicated that before the intervention, mean scores for all concepts of HBM. However, after the intervention were significantly different in the study group, while it was not significant in the control group.

The difference was higher among the intervention group than the control group and it was positive for all concepts except for perceived barriers. This issue indicates that prevention education caused significant

Discussion of the Study Results

This chapter extensively introduces the outcomes of the research in tables and these refer to the objectives of this report, which are as follows:

According to the results of (Table 1), the mean ± SD age of the study group and control group was (53.067 ± 4.234) and (53.467 ± 4.224) respectively. Concerning other demographic characteristics, the majority of participant were 56-60 (43%), and house owner (63%). Regarding marital status, experimental and control group most of participants were (67%) married. Table (1) this study is consistent with (A Mowafy, et.al 2019) who found that statistically differences between cases and control in all sociodemographic parameters, except marital status. Controls had a statistically higher social class and education than cases [12].

The findings showed a positive influence of prevention education program for enhancing of post-menopausal nurses' belief in osteoporosis preventive behavior based on the Health Belief Model. In particular, the participants found post-prevention education program that osteoporosis is a serious condition if they did not follow the preventive measures.

In addition, the perceived susceptibility, perceived severity, perceived benefits, health motivation were significantly improved after intervention with health belief model-based health intervention.

The current study findings were in agreement with Mansour et al, (2017) this study results revealed that the average scores of susceptibility to osteoporosis, seriousness, benefits of exercise, benefits of calcium intake and health motivation were significantly increased after intervention compared to the scores before intervention. These results could be reflecting that the most of females were believed that osteoporosis would significantly affect their lives and the high score seems to imply that young adults understand the benefits of calcium intake [13].

This result was concordant with similar study carried by Malak & Toama (2015) in Jordanian who reported that there was a significant increase the health beliefs of perceived susceptibility, perceived severity to osteoporosis, perceived benefits of exercise and perceived calcium intake to prevent osteoporosis, and to significantly reduce the perceived barriers to increase in scores of susceptibility, severity, perceived benefits, health motivation. It further reduced perceived barriers of post-menopausal nurses in the intervention group.

exercise and calcium, in order to portend an increase in self-reported health motivation [14]. The present study findings incongruent with **Mohammed et al,(2019)** this study shows the average scores of the items of osteoporosis health belief scale pre & post program. The average scores of susceptibility to osteoporosis seriousness, benefits of exercise, benefits of calcium intake and health motivation were significantly increased post- program compared to the scores pre- program While the average score of barriers of exercise and barriers to Ca intake were significantly decreased after the implementation of prevention program [15].

Conclusions

Through HBM based intervention we have the opportunity to prevent osteoporosis and its consequences that cause a lower quality of life and high medical costs. HBM based intervention seems to be more effective in increasing participants' awareness, altering their perception toward osteoporosis and motivating them to apply preventive behaviors to reduce the risks of the osteoporosis & its effects.

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