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The Impact of Cognitive-Behavioral Stress Management Training Program on Job Stress in Hospital Nurses: Applying PRECEDE Model

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ARTICLE INFORMATION

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ABSTRACT

Background: Nursing is one of the most stressful jobs. The present study aimed to determine the effect of a cognitive-behavioral stress management training program based on PRECEDE model on stress reduction among nurses.

Methods: In this quasi-experimental study, which was conducted in 2010, 58 female nurses in Hamadan, northwest Iran were enrolled in the study and were divided into two equal groups included 29 nurses from one Hospital and 29 nurses from the other as intervention and control groups respectively. The data collection tool was a self-administered questionnaire including demographic characteristics and nursing stress scale (NSS). In addition, a questionnaire based on PRECEDE model was used in order to assess predisposing, reinforcing and enabling factors. The intervention was a training program including five sessions during three weeks in which relaxation and problem-solving training was thought. A pre-test and a post-test were performed 1.5 months apart. The t-test, Mann Whitney and Willxocon statistical tests were used for data analysis at 95% significant level using SPSS 13.

Results: The baseline score average of job stress was 113.0 and 109.8 for intervention and control groups respectively (*P*=0.250). After intervention, score average of job stress decreased to 94.0 in experimental group while that of control group remained relatively unchanged (109.2), (*P*<0.001). A significant difference was found in PRECEDE model constructs and stress management behaviors in intervention group compared to control group after training interventions (*P*<0.001).

Conclusion: Training programs based on PRECEDE model might be effective on decreasing job stress in nurses.

Introduction

Nowadays, occupational stress is a prevalent common problem and costly issue in work places. Approximately, all people expose to job stress to some extend[1]. The effect of occupational stress depends on both personal characteristics and job elements. Occupational stress may emerge as the result of interaction between personal characteristics and environmental factors when the work environment demands are beyond the workers' tolerance[2].

Researches indicated that occupational stress among nurses, leading them to job quitting, some mental and physical disorders, impairing occupational relations, and low nursing care quality and job dissatisfaction[3]. Stress management approaches are the methods used by people to overcome environmental stress successfully[4]. There are various methods to be used for adaptation, including relaxation, discussion and dialogue, and physical activity[5]. Nursing is a well-known stressful job, which may have negative effect on the quality of the services provided by nurses. The tension rate among nurses has a reverse relationship with the quality of the services they provide[6].

The value of health education programs depends on their efficacy, which in turn is affected by correct utilization and administration of educational theories and models[7]. The PRECEDE model which was designed by Lawrence Green in 1979 is a planning model for health promotion and is an abbreviation of predisposing, reinforcing and enabling factors causes in diagnosis and evaluation[8]. The PRECEDE model emphasizes on the process of designing and planning health education and promotion programs. This model is used in patient and staff education programs[9]. This model consists of five stages: first stage is social diagnosis. In this stage, quality of life in subjects is assessed. The second stage is epidemiological diagnosis which health problems related to the quality of life are identified. Third stage is behavioral diagnosis. In this stage, behavioral and non-behavioral factors causing health problems, which were identified in the previous stage, are sorted and by ordering behaviors based on importance and variability. Then behaviors which will be the focus of educational interventions are selected. Fourth stage is educational diagnosis. In this stage the predisposing, enabling and reinforcing factors that influence on behaviors which were identified in the previous stage will be determined. Fifth stage is evaluation, which performed in three levels of process, impact and outcome evaluation[9,10]. The effect of PRECEDE model as an interventional framework for improving a certain behavior has already been approved in several studies for controlling hypertension[11], improving nutritional behaviors[12], and promoting the use of safety helmet among cyclists[13]. Stress management training has not been enough emphasized in Iran. Because of a lack of interventional study about occupational stress in nurses by PRECEDE model, this study was conducted to determine the effect of cognitive behavioral stress management training based on PRECEDE model to reduce stress in nurses.

Methods

This quasi-experimental study was conducted on nurses working in the training hospitals in Hamadan County in 2010. Based on the results of pilot study[14], the job stress is more common among female nurses than male nurses. Accordingly, the current study was conducted on the female nurses exclusively. The result of pilot study indicated no significant difference in occupational stress level among five training hospitals in Hamadan County. Therefore, two hospitals, Fatemieh and Shahid Beheshti, were randomly selected as intervention and control hospitals respectively. According to the results of previous studies[14,15], the sample size was calculated at 0.05 significant level. A random sample of 64 nurses were selected and divided into two equal groups. At the end of follow-up, 29 nurses in intervention group remained for analysis. A nurse was dropped out of study due to sickness and two others due to intermittent presence in educational classes. In addition, 29 nurses among control group remained for analysis. Three of them refused to fill out the questionnaire. Data were collected during three work shifts (morning, evening and night).

The data collection instrument was a three-part questionnaire including: demographic, nursing stress scale (NSS) and an author developed questionnaire based on PRECEDE model components to evaluate the present status. The NSS questionnaire contained 34 questions designed by Gray-Toft and Anderson[16] in 1981 regressing the occupational stress of the nurses with a Likert-4 scale with a minimum and maximum score of 34 and 136 respectively. A score lower or equal to 68 considered as low tension, a score between 69 and 103 as moderate tension and a score equal to or above 104 as high tension. The questionnaire was designed by using PRECEDE framework includes; questions

related to predisposing factors (knowledge and attitude). The questions of stress knowledge and the ways to deal with it were 11 questions with a range of score of 0-11. There were nine questions regarding attitude using Likert-5 scale. The upper scores indicated a more positive attitude toward stress-related risks and coping with them. The questions regarding enabling factors (existence of educational resources and their availability and skills to use them) consisted of four questions about utilization stress management methods regarding existence of educational resources with a score range of 0 or 1, availability of educational resources with a score range of 0 or 1 and the skills of using these resources with a score range of 0 to 2 respectively. The reinforcing factors questions included 2 questions related to encouragement of others and the positive feelings of individual after applying stress management behaviors, with a score range of 0 and 1. Related resources were used in designing the mentioned questionnaires[16].

An expert panel of several health education specialists confirmed content validity of questionnaire. To determine the reliability of the questions regarding knowledge and attitude, test-retest method was used and the correlation coefficient of these questionnaires was 0.83 and 0.89 respectively. The reliability of the enabling factors questionnaire and NSS based on Cronbach alpha coefficient was 0.80 and 0.93 respectively.

The stress management behaviors questionnaire consisted of five questions with one of the questions having 12 choices with a score range of 0 to 16 and other four questions were related to the rate to which stress coping behaviors were performed. Likert-4 scale was used for these four questions with a score range of 0 to 3. Various resources were used for designing this questionnaire[18].

In intervention group, training courses were held for three weeks in five consecutive 60-90 minutes sessions. The first educational planning session was held for the officials of Fatemieh Hospital including head nurses, supervisors and matrons (as reinforcing factors) for three hours. Nurses in both groups of intervention and control voluntarily participated in the

study. During the course of the educational program, no intervention was done on the control group. In this program an instructions booklet about the methods of stress management, educational CDs for muscle relaxations and checklists were given to the nurses of intervention group and they were only asked to state their exercises in the checklists.

The evaluation during the educational programs was performed using checklists for the cognitive behavioral stress management training methods including relaxation, aerobic exercises, creative problem solving and time management. The final evaluation (post-test) was done 1.5 months after the end of training course.

All nurses participated voluntarily in the study and were assured that their information would remain confidential. Having at least 4 months to end of the duty was considered to inclusion and more than one session absent was exclusion criteria in the study.

Results

The mean age of intervention group and control group was 32.44 and 30.06 yr, respectively. In both groups, the majority of the nurses worked in rotating shifts. Knowledge and attitude of nurses toward stress and stress-related risks and signs, stress-influencing individual and community factors, and methods of coping them were evaluated as predisposing factors based on PRECEDE model. Before intervention (at baseline), there were no significant differences between the average scores of knowledge and attitude among both groups, but 1.5 months after training course, the score of knowledge increased significantly in intervention group ($P<0.001$). The average score of attitude before and after the intervention was high in both groups (Table 1).

According to the components of the PRECEDE model, the presence and availability of the educational resources and the skills in coping behaviors were considered as enabling factors. The educational resources were the booklet of coping with stress, trainers, psychologist, educational classes and workshops, relaxation CD and educational slides about correct aerobic exercises. The skills that were taught included

progressive muscle relaxation, aerobic exercises, creative problem solving and time management. There was no significant difference in

enabling factors between two groups before intervention but a significant difference was observed after intervention (Table 2).

Table 1: Comparison of the mean scores of knowledge, attitude, behavior and job stress between the two study groups before and after intervention

Variable	Before intervention			After intervention		
	Control Mean (SD)	Intervention Mean (SD)	*P* value	Control Mean (SD)	Intervention Mean (SD)	*P* value
Knowledge	7.06 (1.53)	7.00 (1.22)	0.853	6.20 (1.80)	9.79 (0.77)	<0.001
Attitude	29.41 (3.50)	28.89 (3.43)	0.674	26.86 (3.41)	28.72 (3.27)	0.039
Behavior	6.00 (2.44)	6.00 (2.05)	1.000	5.96 (2.42)	12.03 (2.32)	<0.001
Job stress	109.82 (8.21)	113.00 (12.41)	0.250	109.20 (7.86)	94.03 (8.49)	<0.001

Table 2: Comparison of the frequency of skills performed between intervention and control groups using Willcoxon test

Stress management skills	Control (%)			Intervention (%)		
	Before	After	*P* value	Before	After	*P* value
Relaxation			0.791			0.001
Wrong	25 (86.2)	24 (82.8)		25 (86.2)	0 (00.0)	
Fairly Correct	4 (13.8)	5 (17.2)		4 (13.8)	3 (10.3)	
Correct	0 (00.0)	0 (00.0)		0 (00.0)	26 (89.7)	
Respiratory exercises			0.314			0.001
Wrong	24 (82.8)	24 (82.8)		22 (75.9)	0 (00.0)	
Fairly Correct	5 (17.2)	5 (17.2)		7 (24.1)	2 (6.9)	
Correct	0 (00.0)	0 (00.0)		0 (00.0)	27 (93.1)	
Problem Solving			1.000			0.001
Wrong	27 (93.1)	27 (93.1)		27 (93.1)	0 (00.0)	
Fairly Correct	2 (6.9)	2 (6.9)		2 (6.9)	3 (10.3)	
Correct	0 (00.0)	0 (00.0)		0 (00.0)	26 (89.7)	
Time management			1.000			0.001
Wrong	25 (86.2)	25 (86.2)		24 (82.8)	0 (00.0)	
Fairly Correct	4 (13.8)	4 (13.8)		5 (17.2)	1 (3.4)	
Correct	0 (00.0)	0 (00.0)		0 (00.0)	28 (96.6)	

Encouraging other people and positive individual feelings after stress management behaviors were considered as the reinforcing factors which was considerably low or almost absent before intervention in both groups with no significant difference in two groups. After the intervention, an increase was evident in encouraging other people to conduct stress management behaviors (*P*<0.001).

Before intervention there was no significant difference in the stress management behaviors of the two groups but after implementing edu-

cational programs and these behaviors increased significantly in intervention group compared to control group(*P*<0.001). As shown in Table 3, there was no evident stress management behavior in most of the nurses in both groups at baseline. However, most of the nurses in intervention group often or always conducted the instructed behaviors after intervention. The average score of occupational stress was 113 in experimental group and 109.82 in control group at baseline with no significant difference, however, the mean score of job stress in intervention group reduced to

94.03 after intervention, while it remained un-changed in the control group (Table 1).

Table 3: Comparison of the frequency rate of performing stress management behaviors between intervention and control groups using Willcoxon test

Stress management behaviors	Control (%)			Intervention (%)		
	Before	**After**	*P* value	**Before**	**After**	*P* value
Relaxation			0.791			0.001
Never	22 (75.9)	22 (75.9)		1 (3.4)	26 (89.7)	
Sometimes(2-1 times a week)	5 (17.2)	4 (13.8)		19 (66.5)	3 (10.3)	
Often(5-3 times a week)	2 (6.9)	2 (6.9)		7 (24.1)	0 (0.0)	
Always (2-1 times a day)	0 (0.0)	1(3.4)		2 (6.9)	0 (0.0)	
Respiratory exercises			0.314			0.001
Never	19 (66.5)	20 (69.0)		1 (3.4)	18 (62.1)	
Sometimes(2-1 times a week)	4 (13.8)	5 (17.2)		4 (13.8)	8 (27.6)	
Often(5-3 times a week)	1 (3.4)	4 (13.8)		11 (37.9)	1 (3.4)	
Always (2-1 times a day)	5 (17.2)	0 (0.0)		13 (44.8)	2 (6.9)	
Problem Solving			1.000			0.001
Never	23 (79.3)	26 (89.7)		7 (24.1)	27 (93.1)	
Sometimes(2-1 times a week)	4 (13.8)	1 (3.4)		13 (44.8)	1 (3.4)	
Often(5-3 times a week)	2 (6.9)	1 (3.4)		7 (24.1)	0 (0.0)	
Always (2-1 times a day)	0 (0.0)	1 (3.4)		2 (6.9)	1 (3.4)	
Time management			0.211			0.001
Never	24 (82.8)	27 (93.1)		5 (17.2)	27 (93.1)	
Sometimes(2-1 times a week)	3 (10.3)	0 (0.0)		10 (34.5)	2 (6.9)	
Often(5-3 times a week)	2 (6.9)	1 (3.4)		11 (37.9)	0 (0.0)	
Always (2-1 times a day)	0 (0.0)	1 (3.4)		3 (10.3)	0 (0.0)	

Discussion

The aim of the present study was to evaluate the impact of a cognitive- behavioral stress management training program applying PRE-CEDE model in order to improved stress management behaviors among nurses for decreasing occupational stress. A pre-post test design with control group was chosen in order to meet the aims of this study. Different aspects of the framework of this study discussed as below.

Regarding the predisposing factors (knowledge and attitude), the average score of intervention group increased more than the control group which confirms the findings of the previous studies[16,17]. The attitude of subjects in both intervention and control groups were positive before and after the training course and the analysis of t-test revealed no significant difference between the groups at baseline, but the difference was significant after the intervention. High attitude and the necessity of coping with stress in nurses can be due to their education level and scientific information that they possess. In one similar study[18], the researchers used PRECEDE model to improve the quality of patient care after cardiac surgery and the attitude of experimental group increased after educational intervention compared to control.

In the present study, the use of educational resources by nurses and the availability of these resources to them before education were minimum but this has increased in experimental group after intervention, which is a statistically significant increase. Most participants were not familiar with the methods of coping with stress but the experimental group subjects learned these methods sufficiently compared to pre-intervention period as well as the control group. The enabling factors increased as the result of training course including educational classes, progressive muscle relaxation CDs, educational CDs, educational booklet by the educator, pictures and educational slides about proper aerobic exercises, educational workshops for creative problem solving, and time management in a practical manner in an artificial situation in

presence of the educator. These results are confirmed by one research on improving of student safety behavior[19]. The stress management skills such as progressive muscle relaxation as enabling factors, can play a positive role in decreasing stress and anxiety among nurses which was illustrated both in the present study and in the previous research conducted by Dehkordi et al[20].The reinforcing factors in reducing occupational stress after educational intervention in intervention group increased much more than control group which are similar to the results of similar studies[17].

In this study the behavioral factors were considered as the stress management behaviors. Based on the findings, the mean behavioral score and the degree of accomplishing those behaviors for dealing job stress indicated a significant increase after educational interventions in experimental group.

The mean occupational stress score decreased significantly in intervention group compared to the same group before intervention as well as the control group pre- and post-intervention. These are in accordance with Rezai's research about the effect of teaching the communication skills on the nursing stress[15]. In addition, the findings of the present study approve the results of several studies which have utilized the PRECEDE model in behavior modification of mothers regarding anemia and children's iron deficiency[17] and self-regulation behaviors (exercise, relaxation and nutritional behavior) in order to control the premenstrual syndrome[21]. Although this study has several strengths, such as being theory based and quasi-experimental design, the study had some limitations. First, the sample was homogeneous. In addition, some nurses did not cooperate to fill out the questionnaires. However, future studies in this context should be conducted to include male nurses as well as health workers working in different fields.

Conclusion

Due to stressful nature of nursing job, Increasing stress management training programs in hospital nurses is largely recommended. PRECEDE model is a useful framework in forecasting stress management behaviors and can be a base for educational intervention in nurses. Thus, for reducing occupational stress and finally promoting physical and mental health in nurses, using such educational programs used in this study is recommended and emphasized.

Conflict of interest statement

The authors declare that they have no conflict of interest.

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