Effectiveness of Theory-based Educational Intervention on Low Back Pain Preventive Behaviors in Nursing Aid Staff

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Authors

Sarallah Shojaei[1,2] *PhD*
Sedigheh-Sadat Tavafian[1] *PhD*
Ahmad Reza Jamshidi[3] *MD*
Seyedeh-Somayeh Kazemi[4*] *PhD*

[1] Department of Health Education and Health Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran.

[2] Department of Community Health Nursing, Faculty of Nursing and Midwifery, Qom University of Medical Sciences, Qom, Iran

[3] Rheumatology Research Center, Tehran University of Medical Sciences, Tehran, Iran

[4] Health Network, Mazandaran University of Medical Sciences, Chaloos, Iran.

* *Correspondence*

Address: Health Network, Mazandaran University of Medical Sciences, Chaloos, Iran.
Phone: +98 (11) 52226160
Fax: +98 (11) 52221635
P.O.Box: 4661619373
Email: somayeh.kazemi7@gmail.com

ABSTRACT

Aim: Work - related Musculoskeletal Disorders (WMSds) are mainly associated with nurses' high physical demands. Training healthy behavior can reduce these disorders. This study aimed to evaluate the effect of educational intervention based on Social Cognitive Theory (SCT) on changing unhealthy behaviors leading to(LBP) in nursing aid staff working in Qom hospitals.

Method and Materials: A quasi-experimental study was conducted from 2017 to 2018 with educational intervention based on SCT was performed on 452 nursing aid. Data collection tools were the questionnaire of SCT constructs, the LBP Prevention Behavior Questionnaire (LBPBPQ), the Quebec Back Pain Disability Scale (QBPDS), and the Visual Analog Scale (VAS) for LBP. The training was based on the four structures of self-efficacy, self-regulation, outcome expectation, and moral disengagement in groups of 20 to 30 individuals. Then the pre-and post-intervention data were compared through the statistical tests.

Findings: After the intervention, SCT structures were increased significantly. The mean score of lumbar health behavior after training showed a significant increase from 32.59 to 32.57. The mean score of LBP after training decreased significantly from 5.17 to 3.98 and the mean score of physical disability of LBP decreased significantly after training.

Conclusion: Educational intervention based on SCT reduces the severity of LBP and the consequent disability.

Keywords: Educational Intervention, Social Cognitive Theory (SCT), Unhealthy Behaviors, Nursing Aid Staff, Low Back Pain (LBP)

Introduction

Work-related Musculoskeletal Disorders (WMSD) are a significant issue in the health care sector especially nurses [1]. Its prevalence is mainly associated with nurses' high physical demands that still remain poorly studied in Primary Health Care (PHC) [2]. Given that occupational traumatic behaviors are the main cause of Low Back Pain (LBP) in these people and training healthy behavior can reduce these disorders.

Occupational conditions predispose to musculoskeletal disorders, the most common of which today is LBP[3]. The prevalence of LBPis higher in some occupations than in others. The highest incidence and recurrence of LBPis seen in employees such as construction workers, nurses and drivers [4]. Due to the nature of the task, nursing is one of the occupations in which WMSDs are highly prevalent [5] because of significant heavy activities [6]. Different factors are involved in the incidence of LBP in nurses, among which patient transfer has been considered as an important factor. In a study by Trinkoff et al., it was found that nurses were more likely to have lumbar injuries when transferring patients requiring sudden movements with inappropriate posture [7]. Activities that require frequent body changes, lifting heavy loads, bending and rotation, due to the imbalance of the body and pressure on the lumbar region, can play a role in causing LBP [8].

Carrying a patient requires a set of physical movements and postures such as bending, twisting, and repetitive movements, and may cause excessive force and shear force on the spine when moving or changing the patient's body position [9]. Therefore, nurses who perform more patient transferring/ movement have more lumbar problems than others [10]. In a study by Ghadyani et al. [11], the most important unhealthy behaviors in nursing staff in relation to chronic mechanical LBP were found to be due to lifting and moving the patient in bed, transferring the patient to a chair and stretcher, and arranging the patient's bed. Previous study found that increasing age, type of ward, work experience, frequent bending, inadequate rest, relocation of patients, and emergency conditions such as Cardiac Pulmonary Resuscitation (CPR) also lead to LBP among nurses [12].

The rise of musculoskeletal disorders in nurses affects not only the nurses themselves but also the community, treatment and care systems, and patients. Furthermore, it imposes enormous direct and indirect costs [13]. Chronic LBP is one of the many problems caused by these disorders, which by creating disability as well as physical, emotional and occupational problems, and thus imposing direct and indirect costs, necessitates due attention [14]. Low bac pain leads to leaving from work, Job burnout, disability, early retirement [12].

Among the ways to prevent chronic LBP are to teach the correct principles of body mechanics, stick to the principles of ergonomics, and taking correct posture. Using an ergonomic program can significantly reduce back and shoulder damages, missed work days, and limited work days [15]. In a study by Traeger et al., back pain prevention training reduced back pain [16]. Changing negative habits, eliminating the risk factors for LBP, and creating positive preventive habits can reduce many back pain problems [17].

Many factors may affect people's decision to adopt a healthy behavior. Providing knowledge and messages alone is not enough to change behavior; rather it is important to understand the potential intermediaries that may lead to success in achieving behavioral change [18]. Theory-based interventions can motivate people to change their attitudes and behaviors [19]. Therefore, health educators should pay attention to the type of behavior, target population, and patterns used in similar previous interventions in order to choose the appropriate model for their interventions [20]. The use of patterns and theories of behavior change helps to identify the characteristics of the individual and his/her environment that may affect his/her behavior in some way. Due to the fact that all of the triple dimensions (individual, behavioral, environmental) are effective in LBP, the look at this issue should also be comprehensive and versatile to correct the behavior. One of the theories in this regard is Bandura's Social Cognitive Theory. This theory describes and predicts human behavior and considers it to be the result of continuous interaction between the individual, behavior and environmental determinants. It looks comprehensively and multidimensionality at the issues around, and can respond to the problem, and help prevent and treat LBP [21]. In the present study, to provide the educational content, the four effective structures of self-efficacy, self-regulation, outcome expectation, and moral disengagement of this theory were selected in performing lumbar health behaviors in nursing aid staff.

Given that the main burden of patient transferring/movement and providing care services is included in nurses' duties, LBP and its common physical and psychological consequences will impose significant costs

to these people, and ultimately, to the entire health care system [22], this study was conducted with the aim of developing an educational program to change the harmful behaviors to the spine among nursing aids so that by providing a proper intervention, an effective step in preventing back pain could be taken.

Method and Materials

This semi-experimental study was conducted in 2018 to assess the effect of educational intervention on changing unhealthy behaviors causing spinal cord injuries and LBP in nursing aid staff .

The study population was the nursing staff who working in hospitals of them 452 nursing aids were selected by Convenient Sampling.

Inclusion criteria included being age 20 to 60 years old, having a work history of at least one year in hospitalization (patient transferring) services, having work-related LBP lasting more than three months and approved by a physician, desire to participate in the study, having no active disease in the neck or lumbar joints and no congenital anomalies in the spine, and also having no physical defects. Exclusion criteria included simultaneous participation in treatment, exercise, nutrition, and other physiotherapy programs, and suffering from illnesses and problems preventing the person from attending the study or training classes.

In this study an educational intervention was designed based on the most important structures of Social Cognitive Theory (SCT). In providing the educational content, the structures of self-efficacy, self-regulation, outcome expectation, and moral disengagement were considered as the mediating variables affecting on preventive behavior of LBP. Additionally, issues such as underlying occupational causes of LBP, correct spinal position during

patient care services, correct methods of moving the patient, correct body postures, proper back exercises, using preventive and reducing back pain behaviors and using the predictive structures of SCT to avoid doing harmful spinal behaviors were included in the educational content. This educational program included four 2-hour education/ practice sessions that held by health education and promotion specialist in 2018 in educational spaces in hospital and university of medical sciences. The methods applied here were consisted of guided practices, confirmation of skillful experiences, verbal persuasions, encouragements, behavior self-monitoring, creation of conditional rewards, goal setting, benchmarking, training of skills, setting tasks on a proper slope of hardness and response, negotiations, stress reduction techniques, and role-playing.

Data collection tools included as follows.

The questionnaire based on the effective structures of Bandura's SCT whose validity and reliability was measured in previous studies [23]. The Musculoskeletal Work Related Low Back Pain Behavior Prevention Questionnaire (LBPBPQ) had 12 questions in care and hospitalization services, and its score range was 12-48; higher score was more desirable. It included self-efficacy, self-regulation, outcome expectation, and moral disengagement structures. The self-efficacy structure had 7 questions and its score range was 7-35. The self-regulation structure had 6 questions and its score range was 6-30. The outcome expectation structure had 8 questions and its score range was 8-40. The moral disengagement structure had 4 questions and its score range was 4-20. In this instrument the higher score showed the more desirable.

The Qubeck Back Pain Disability Scale (QBPDS) included 25 questions with a score range of 0-100; lower score represented lower disability [24].

The Visual Analog Scale (VAS) for LBP with the score range of 0-10; the lower was the score, the less painful was the pain [25].

These three tools were completed by the participants in two stages of before and six months after the intervention. Then before- and after-comparisons were done.

The internal consistency of the questionnaire based on the effective structures of Bandura's SCT, as assessed by the Cronbach's α coefficient, showed satisfactory results with alpha ranging from 0.75 to 0.85 for each concept and 0.83 for the entire questionnaire. The ICC of the MWRLBPBPQ also was found to be satisfactory, indicating that the questionnaire had good stability. The five-part Likert scale (from score 1 meaning "totally agree" to score 5 meaning "totally disagree" was used for all items [23].

To assess the LBPBPQ validity, an expert panel of 10 specialists including two neurosurgeons, one rheumatologist, one epidemiologist, three nursing teachers, and three health education experts checked the items and provided recommendations. After assessing the content validity, the questionnaire was simplified so that each participant could answer the questions easily. These procedures have been described in a previous study [23]. A pilot study was conducted among 25 nursing assistants from different units in Qom hospitals to determine the face validity of each question. Based on this, items were evaluated and modified for appearance, fitness, brevity, clarity, ease of understanding, and inclusiveness [26].

The QBPDS is a condition-specific measure of disability first described by Kopec et al. [27]. This is a 20-item self-administered instrument designed to assess the level of functional disability in individuals with LBP. To complete this scale the patient was asked to rate the degree of his or her difficulty in performing different activities from 0 (not difficult at all) to 5 (unable to do), giving a total score ranging from 0 (no disability) to 100 (maximum disability). The reliability and validity of the Iranian version [4] have been documented.

In present study SPSS ver. 18.0 (SPSS Inc., Chicago, IL, USA) was used for all data analysis. Student t-tests or paired t-tests were used for continuous variables, and chi-square tests were used for categorical variables when comparing differences. Moreover, to describe and analyze the data, central and scattering indicators, as well as parametric and nonparametric tests and analysis of variance of repetitive measurements were used. Individual was the smallest unit that is being analyzed to assess intervention effects.

Findings

A total of 452 nursing aids participated in the study with a mean age of 37±8.3 years. Table 1 shows the participants' demographic information.

The results of the Analysis of Variance (ANOVA) of repetitive measurements at three times of studied structures of SCT at three timepoints of before, immediately and six months after the intervention are shown in Table 2.

The mean score of preventive LBP behavior before and six months after the intervention is shown in Table 3. The behavior score improved significantly by 6 months in the target group based on paired sample T test. All studied health care workers in this study were official employees of the hospitals and so were accessible after six months. Therefore, there were no missed participants.

Discussion

The results of this study showed that the effect of intervention based on SCT structures was significant in optimizing the participants. The training program was

Table 1) The demographic description of the participants

Variables (n = 452)	(Mean ± SD)
Age	37±8.3
Work history	10.27±8.1
Gender	N (%)
Male	289 (63.9)
Female	163 (33.6)
Occupation status	
Formal	31 (7)
Informal	16 (3.5)
Contractual	366 (81)
Other	22 (4.7)
Education Level	
Bachelor	58 (12.8)
College	14 (3.1)
Diploma	112 (24.8)
Elementary	113 (25)
Primary school	138 (30.5)

Table 2) The scores of the studied structures across the three time periods (Mean ± standard deviation)

	Before intervention Mean± SD	Immediately after intervention Mean ± SD	6-months follow-up Mean ± SD	P*
Self-efficacy	25.92±5.39	28.83±5.28	27.36±4.70	<0.0001
Self- regulation	19.91±5.47	23.44±4.99	22.49±4.97	<0.0001
Outcome expectation	32.21±0.25	34.88±0.25	33.46±0.21	<0.0001
Moral disengagement	14.17±3.27	16.40±3.21	15.67±2.95	<0.0001

* Repetitive Measurements (RANOVA)

also able to increase self-efficacy such that the participants reached a stage where they could control and monitor their behavior and the consequences, recognize the preventive LBP behavior and provide the ground for behavior correction by controlling emotions and overcoming the inhibitory emotional responses. However, after 6 months, there was a slight decrease in the scores of the SCT structures. It can be concluded that since humans are, generally, inclined to forget; the effectiveness of education may decrease over time. Although educational intervention alone is effective initially, it needs to be reminded and noted frequently. Therfore, in order to achieve the ultimate goal, one should not give up, and continuous pursuit and effort is an important thing that should not be neglected until achieving the ultimate goals. The study of Kazemi et al. showed that educational intervention that is accompanied by repetition and reminder is

Table 3) Comparison of the score of preventive behavior, low back pain, and physical disability across the two time periods (Mean ± standard deviation)

Outcome ╲ Time	Before intervention	Six months after intervention	P value
Preventive LBP* behavior	31.59±8.00	32.57±6.7	0.017
Visual Analog LBP score	5.17±2.6	3.98±2.47	<0.0001
LBP disability	49.40±20.95	46.48±19.41	0.0003

* Low Back Pain

more successful and effective [28].

The study also found that training based on the effective structures of SCT increased preventive behaviors against LBP. In a qualitative study conducted by Tavafian et al., the participants acknowledged that not only they did not have a positive understanding of back health behaviors, including how to maintain the correct biomechanical condition of the spine, but also did not have the necessary skills to do these behaviors [29]. The results of other studies in the line with this study showed that with even a short-term training and recommendation to perform healthy behaviors, a positive change in the individual's behavior could be made [19]. The mean score of performing the behaviors and ergonomic principles that prevent chronic LBP after presenting the school curriculum in the form of multimedia showed a significant difference in the intervention group comparing to the control group [30]. Another study in Sweden in which 213 people with chronic LBP were randomly divided into two groups (one group undergoing a cognitive-behavioral training program and the other undergoing a treatment program), the treatment group showed improvement in 26 out of the 33 variables after one year of follow-up training, and the training group showed a significant change in behavior comparing to the other group [31].

The results of this study further showed that in the next stage of training, the amount of back pain and the resulting disability have decreased. The findings of previous study also indicated an increase in the score of the physical function domain of quality of life after training in the intervention group, which can be due to the effect of training program and doing the preventive LBP behaviors [32]. Similarly, one other study indicated that people attending Back school classes had less severe pain and less relapses after three years comparing to those who did not receive these trainings and did not exercise [33]. Another clinical trial, which was performed on people with LBP, showed that in the intervention group who received training, the days of absence from work were less; furthermore, they were more adaptive to pain and had higher satisfaction [20]. It has also been reported that a low-back pain education program improved the quality of life of employees with LBP; they scored higher on the indicators of "physical condition", "physical function " and "general health" [34].

Similar to previous studies , this research has some limitation . In this regard, the low level of education of some participants, self-report of data gathering and lack of cooperation of some participants in filling out the instruments are among the limitations of the study.

Conclusion

According to the effective results of the training program based on SCT in prevention and treatment, it can be included in

prevention and primary healthcare programs in the country's health care system and thus reduce the costs imposed by frequent visits to physicians. Due to the fact that the approach of LBP and ways to prevent it is a priority in the programs of the Ministry of Health, Treatment and Medical Education at the first, second and third levels of prevention, this program can be used in educational centers and work environments to change the life style of people, and ultimately, improved their health and quality of life.

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