ISSN: 2476-5279; International Journal of Musculoskeletal Pain Prevention. 2019; 4(3): 211-221

Social Media Intervention for Lower Back Pain Education Study (SMILE): A Protocol for a Randomized Trial To Reduce Occupational Low Back Pain in Nursing Professionals

ARTICLE INFO

Article Type
Protocol study

Authors
Seyedeh-Somayeh Kazemi[1], *Phd*
Sedigheh-Sadat Tavafian[1*], *Phd*
Ali Montazeri[2], *Phd*

How to cite this article
Kazemi S.S, Tavafian S.S, Montazeri A. Social Media Intervention for Lower Back Pain Education Study (SMILE): A Protocol for a Randomized Trial To Reduce Occupational Low Back Pain in Nursing Professionals. 2019; 4(3): 211-221.

[1] Department of Health Education and Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran.
[2] Health Metrics Research Center, Iranian Institute for Health Sciences Research, ACECR, Tehran, Iran.

** Correspondence*
Address: Tehran, Jalal Al Ahmad, Nasr Bridge.
P.O. Box: 14115-111
Phone: +98 (21) 82884547
Fax: +98 (21) 82884555
Email: tavafian@modares.ac.ir

Article History
Received: Oct 23, 2019
Accepted: Nov 29, 2019
ePublished: Jan 20, 2020

ABSTRACT

Aim: Low Back Pain (LBP) in the nursing profession remains an important health issue. This study aims to assess whether a theory-based interactive social media intervention could change job-related risk behaviors among nursing personnel.

Instrument and Methods: This is a community-randomized controlled trial. Three settings of hospitals will randomly be assigned to the study arms: Intervention setting 1 receiving an in-person educational package; intervention setting 2 receiving the same material a web-based, and a control setting receiving nothing. The intervention would contain materials related to occupational risk behaviors and will try to promote the knowledge, attitude, skill, and self-efficacy of nurses on low back pain preventive behaviors. The primary outcome will be reduction in low back pain. The study also will assess whether the intervention could reduce pain-related disability and improve the quality of life.

Discussion: Occupational LBP among nurses could adversely affect both patients' and nurses' health. This study is an attempt to see if social media could play a role to guide the development and implementation of future interventions.

Trial registration number: IRCT20170313033054N2.

Keywords: Occupational Low Back Pain, Social Media, Risk Behavior, Disability, Quality of Life.

Introduction

Work-related Musculoskeletal Disorders (WMSDs) are estimated to be the most common and frequent of all occupational diseases [1]. Furthermore, they are the most important factor in losing time and damage to the workforce [2]. Musculoskeletal disorders when are created people have an inappropriate physical condition while doing their jobs and tasks, causing pain in muscle and bone such as pain in the waist, neck, shoulder, elbow, wrists, Arms, hands and also organic lesions in some areas and organs [3].

Musculoskeletal disorders account for 7% of all diseases in the community; of which Low Back Pain (LBP) is one of the most prevalent disorders [4]. LBP is a common, recurrent and costly health problem worldwide [5]. LBP affects between 51 and 90% of people at some point during their lifetime [6, 7]. It has been evidenced that LBP is one of the main reasons for seeking medical care [8, 9]. It causes a massive medical and economic load on individuals, families, communities, industry, and governments [10-12].

The prevalence of LBP in is higher in some professions than in others [13]. For instance, nursing professions are particularly experiencing a higher risk of LBP and it accounts for 60% of the reported occupational disorders this population [14-16]. Nursing has been recognized between the top professions at risk of LBP [17], with LBP rates exceeding those employed in heavy industry [18, 19]. The year prevalence of LBP in nurses has a mean of 70% [20-22] and the lifetime prevalence ranges from 35 to 80% [17, 23-25]. Recurrence rates of LBP in nurses exceed 70% [26].

**Corresponding Author:* Address: NO. 212, Health Education and Health Promotion Department, Faculty of Medical Sciences,Tarbiat Modares University, Nasr Bridge, Jalal-Al-Ahmad Highway, Tehran, Iran Phone: +98 (21) 82884547 Fax: +98 (21) 82884555.

[DOR: 20.1001.1.24765279.2019.4.3.3.5]
[DOI: 10.52547/ijmpp.4.3.211]

LBP in the nursing profession occur for several reasons including the nature of nursing care, patient mobility, long-standing, rotational movements, and repeated bending [27, 28]. Even those who are working in emergency departments and intensive-care units are likely to suffer more from LBP due to their specific working conditions [27]. The impact of LBP for nurses is large and includes work absenteeism, increased risk of chronicity, associated personal and economic costs, reduced nursing workforce efficiency, disability and decreased quality of life [17]. There are myriad factors have been identified for low back pain. Biomechanical risk factors such as physical load, force, frequency, vibration, bending, twisting, lifting, pushing/pulling, carrying, heavy physical work, posture. Psychosocial risk factors may affect a workers' psychological response to their work and influence the risk of low back disorders. For example, the mental workload, job stress, job satisfaction, social relations, job security, job demands, organizational level. Individual or personal risk factors such as age, gender, Body Mass Index (BMI), family history, genetics, smoking, physical activity, work experience [29]. Although several factors play a role for LBP in nurses, one of the most important reasons for LBP due to occupation among nurses are behavioral factors [30, 31]. In other words, it is argued that if nursing professions could take care of their behaviors during working hours then it would be possible to reduce or lessen their pain and suffering. It is argued that the main barriers to nurse education are time constraint, shortness of classrooms in hospitals, several job commitments, and the costs. Indeed, to overcome these limitations we decided to use an interactive social media intervention. The use of social media interventions is increasingly becoming popular in public health and a number of studies showed that they were promising platform for promoting healthy behaviors especially when they were theory driven.

[32-34]. Several studies indicate interventions that were strongly based in theory had a greater impact than those that were not [35]. Thus, we decided to indicate behavioral factors that cause LBP among nurses, design and develop an appropriate intervention based on the PRECEDE model (Predisposing, Reinforcing and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation), and finally implement the intervention.

The PRECEDE is part of the PRECEDE-PROCEED (Policy, Regulatory and Organizational Constructs in Educational and Environmental Development) model and it is the most popular and commonly used health education planning model [36]. As shown in Figure 1, a behavior can be influenced by predisposing, reinforcing, and enabling factors and thus an educational intervention or program based on the PRECEDE model seeks to identify these three factors and then if necessary make changes to predisposing factors (including knowledge, attitudes, beliefs and values), reinforcing factors (including attitudes and behaviors among those who are involved), and enabling factors (including access to resources, availability of health services, policies and legislation, and existing regulations, and behavioral skills that affect the adoption of a health behavior). Therefore, the reason for using this model to develop an interactive social media intervention for the prevention of LBP is mostly comes from the multidimensional nature of job-related low back pain. In fact, this study tries to find out predisposing, reinforcing and enabling factors that can be applied to a program in the workplace in order to reduce LBP among nursing professions. Another important reason for using the PRECEDE model is the unique ability to use it in designing and

[DOR: 20.1001.1.24765279.2019.4.3.3.5]
[DOI: 10.52547/ijmpp.4.3.211]

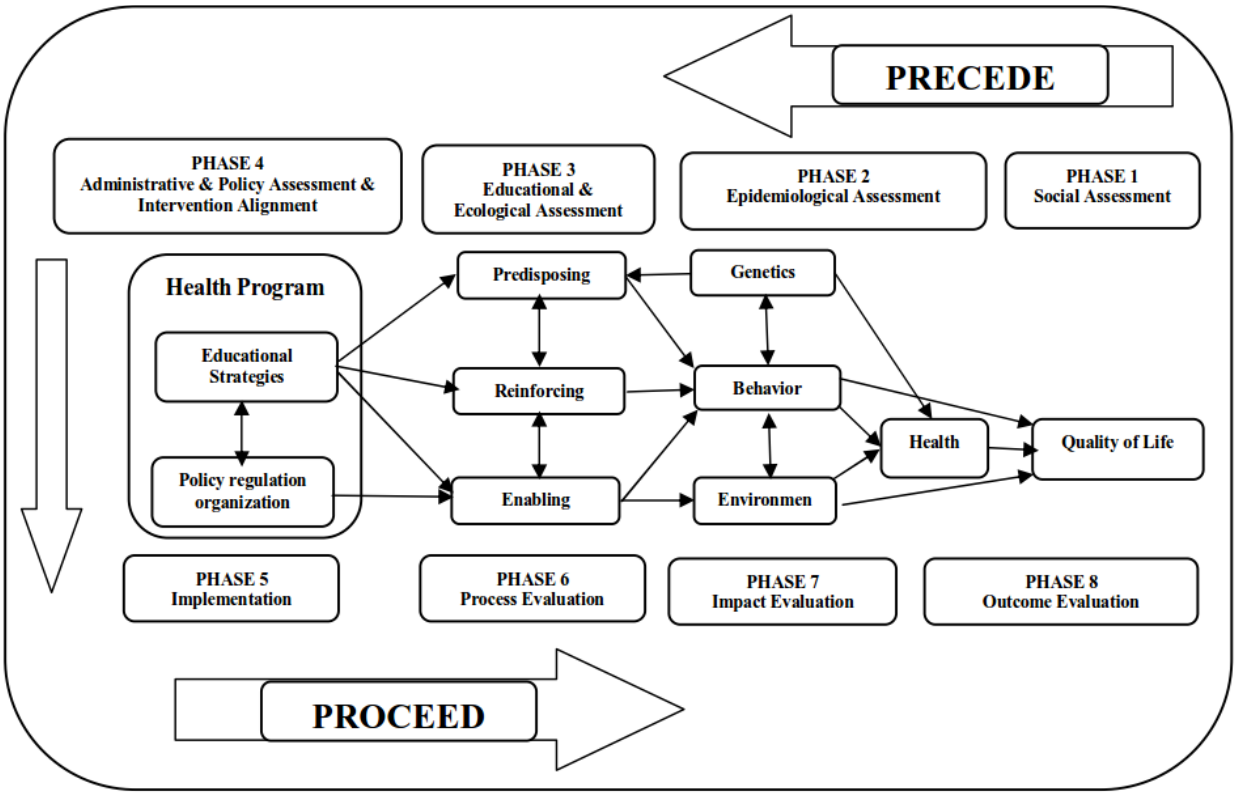

Figure 1) PRECEDE-PROCEED Planning Model

implementing educational interventions in the work environment. This is why the model has been the foundation of many health education and health interventions in the past three decades [36].

Several studies exist that examine the effectiveness of different educational interventions in this population [37-41]. For instance, a study reported that stretching exercises in nurses with LBP resulted in significant lower pain scores at follow-up compared to the control group [41]. However, a recent systematic review of the literature on the efficacy of interventions for LBP in nurses concluded that 'at present there is no strong evidence of efficacy for any intervention in preventing or treating LBP in nurses. The authors recommended that it might be worth exploring high quality individualized interventions [17]. Yet, many health behavior change websites are not theory driven and fail to incorporate proven, evidence-based approaches. A study by Evers et al. (2003) found that of 37 public health behavior change sites, few were theory driven or used evidence-based approaches [42].

The overall aim of this study is to develop and evaluate a theory based interactive social media intervention in order to reduce occupational LBP in nurses working in teaching hospitals.

Instrument and Methods

This study consists of three phases. An overview of the different phases containing aims, methods and participants are depicted in Table 1. The overall aim of this study is to develop and evaluate a theory based interactive social media intervention in order to reduce occupational LBP in nurses working in teaching hospitals.

This is a community-randomized controlled trial. The study will conduct in three hospitals. First, we will provide a list of all hospitals, and three hospitals will select randomly. Then selected hospitals allocated randomly

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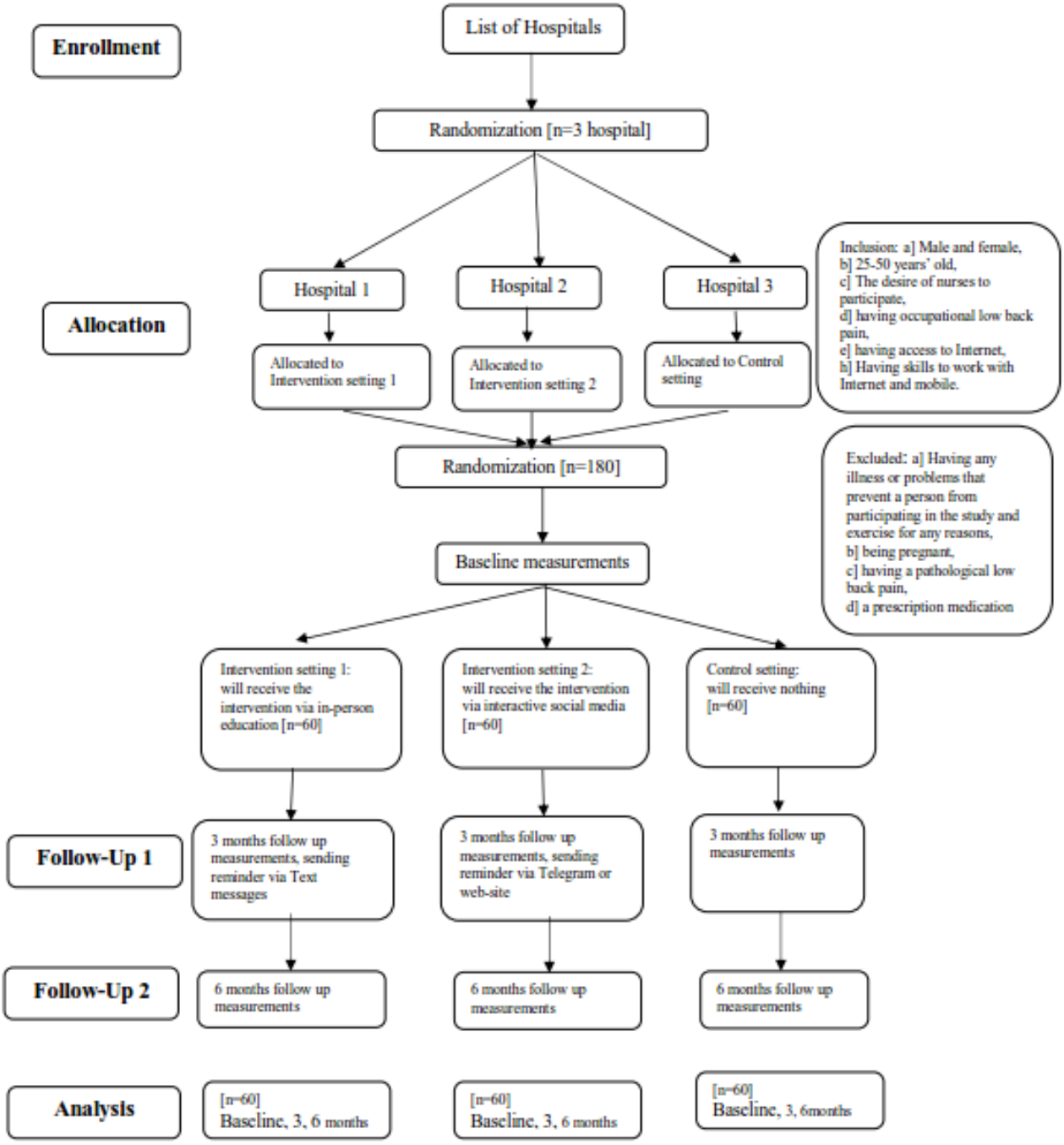

Figure 2) CONSORT flow diagram

by Roll of a dice to two intervention settings and one control setting. The intervention settings will receive educational programs while the control setting will receive nothing. Participants will be assessed at three points in time: at the baseline, three and six months follow up. The study procedure from enrollment through follow up data collection and analysis are shown in Figure 2. The study setting will be hospitals affiliated to Mazandaran University of Medical Sciences. The participants are nurses working in hospitals affiliated to Mazandaran University of Medical Sciences. Inclusion criteria in this study will be as: being female, 20-25 years' old, the desire of nurses to participate, having occupational LBP, having access to Internet and having

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[DOI: 10.52547/ijmpp.4.3.211]

Table 1) The study overview

Phases	Aim	Methods	Participants
Phase 1			
Situational analysis	**Step 1:** Identifying predisposing, reinforcing, enabling and environmental factors affecting occupational behaviors	In-depth interviews	Hospital's executive, managerial and policy-making, target groups [Nurses]
	Step 2: Design questionnaire	Based on step 1	Researcher
Phase 2			
Design interventions	Target group training	Based on social media and in-person	Researcher
Phase 3			
Implementation	**Step 1:** Transfer educational content to target group	By social media and in-person intervention	Nurses
Intervention Evaluation	**Step 2:** Evaluate the program Identify the impact of the program in the target group	Questionnaire Checklist	Nurses

and having skills to work with Internet and mobile. Exclusion criteria in this study will be having any illness or problems that prevent a person from participating in the study and exercise for any reasons, being pregnant, having a pathological low back pain, and having a prescription medication for low back pain.

The main aim of this study was LBP reduction. Thus, we will identify the individual and environmental factors affecting the back pain. For recognizing risk factors, and effective factors in promoting the health of the low back and design intervention, we will use the PRECEDE PROCEED model. The findings of this phase will be obtained through semi-structured interviews.

On based the educational and ecological assessment phase, we can determine factors that, if modified, would be most likely to result in behavior change and to sustain this change process. These factors are generally classified as predisposing, enabling, and reinforcing factors [36]. According to administrative and policy assessment phase, we will identify resources, organizational barriers and facilitators, and policies for intervention implementation and sustainability [43]. The educational content will include occupation LBP and causes, the role of human and environmental factors affecting low back pain , stressors in the workplace, impact on back pain and stress management techniques, communicate effectively, reinforcing and enabling factors affecting the health-promoting behaviors of the low back , ergonomic and correct position of the spine in daily work, stretching exercises to increase flexibility ,strengthening exercises to increase muscle strength.

This educational material will be evidence-

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[DOI: 10.52547/ijmpp.4.3.211]

based and elaborated using understandable language and different formats, including pictures, video and 2 - 3D animation. The nurses will be able to contact a researcher by email, call and website. Furthermore, to reinforce nurses' motivation and participation, encouraging certificate (for annual evaluation) will implement.

The intervention setting 1 will receive the intervention via in-person education. They will receive education content in two sessions and 60 minutes per session and through group discussions, role-playing, questions-answers, lectures, educational films and, animations.

The intervention setting 2 will receive the intervention via a web site. They will receive training on how to use the site and they will be monitored by the main investigator. The content of the education will upload to the site in two days and at a specified time, such as the In-person intervention hospital. The content of intervention will be similar to setting one. Both of the intervention settings will receive a weekly reminder during the study period.

The control setting will receive nothing. However, after completion of the study the control group will receive one of the interventions based on their interest.

The primary outcome will be, reduced lower back pain. Lower back pain reduction will be assessed by using a VAS questionnaire.

Secondary outcomes will include reduced pain-related disability and increased quality of life.

Data collection instrument will the standard questionnaire contained Visual Analog Scale, The Quebec Back Pain Disability Scale, Health Survey SF-36 and self-design questionnaire. The questionnaires will complete by nurses in 3 points time; before intervention, 3 months and 6 months after intervention. The questionnaires will nameless to participation's confidence towards the intervention.

The LBP Visual Analog Scale (VAS) has been widely used for measuring pain [44]. Operationally a VAS is usually a horizontal line, 100 mm in length, anchored by word descriptors at each end, from none to an extreme amount of pain (none, mild, moderate and severe) [45]. The validity and reliability of this scale have been repeatedly confirmed [46-48].

Reduced pain-related disability will be assessed by using the Quebec Back Pain Disability Scale (QBPDS) and increased quality of life will be assessed by using the Short Form Health Survey (SF-36) and at three points in time: at the baseline, three and six months after the intervention.

QBPDS is a 20-item self-administered instrument designed to assess the level of functional disability in individuals with back pain. Each item is rated on a 5-point Likert scale ranging from 0 to 5 giving a total score of 20 to 100. Higher scores indicate greater disability [49]. The validity and reliability of the Iranian version of the questionnaire are confirmed elsewhere [50].

SF-36 is a 36-item questionnaire that measures eight dimensions of health status including physical functioning (10-item), role physical (4-item), bodily pain (2-item), general health (5-item), vitality (4-item), social functioning (2-item), role emotional (3-item) and mental health (5-item) [51]. The psychometric properties of the Iranian version of the questionnaire are well documented [52].

Other variables also will be measured, including knowledge, attitude, self-efficacy, reinforcing factor, enabling factor and behavior (by self-design questionnaire). The self-designed questionnaire will design of 30 items and six components. Components will include knowledge, attitude, self-efficacy, reinforcing factor, enabling factor and behavior. Items with the Likert spectrum

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will be five parts. Its validity and reliability will be calculated.

One hundred and eighty nurses working in hospitals affiliated to Mazandaran University of Medical Sciences who are eligible to enter into the study will be recruited. The sample size including 10% drop, 60 people are estimated for each study group in order to detect at least 20 percent differences in the primary outcome between intervention and control groups. As such the study would have a power of 80% at 5% significant level. For randomization, first we will provide a list of all hospitals from Mazandaran University of Medical Sciences. The name of hospitals will write on the card and placed in the box. Then the cards will blend and select 3 cards one after another. Then selected hospitals will allocate to intervention and control setting based on Roll of a dice [two hospitals as intervention settings and one hospital as the control setting]. That way the numbers 1 and 2 will for the intervention setting 1, numbers 3 and 4 for the intervention setting 2 and the numbers 5 and 6 for the control setting.

In each hospital, participants will select based on the random number table and staff ID. We will label the staff ID. Then, we will select the starting point on the table and will be continued until the number of samples is completed.

The researcher will generate the random allocation sequence and will enroll participants, then will assign participants to interventions. This study will be Single blind and participants will not be informed about setting allocation.

Statistical analysis

The quantitative data will be analyzed using SPSS V.23 (and if necessary, AMOS software). Descriptive statistics will include frequencies, means, and standard deviations. The Kolmogorov-Smirnov test will be used to check the normal distribution of data.

Between three groups the primary and secondary outcomes will assess using One Way ANOVA, Post-hoc (LSD) for determining the mean differences between which group. Also, for each group, we can use from ANOVA with a repeated measure for assessing the specific variable in three-time points. Continuous outcomes measured at the baseline and the third month will assess using baseline-adjusted ANCONA in the third month. For each group, continuous outcomes measured in the third month only will assess using paired-sample t-tests. Then the six-month outcomes will analyze and compare with the baseline and the third-month outcomes. The Mixed between-within subject analysis of variance will use to compare the two types of interventions. Sensitivity analysis for the primary outcome analysis used linear regression models adjusting for baseline prognostic variables, BMI, working hours, smoking, long-standing, heavy lifting, patient displacement, frequent bending and stress at the workplace.

For analysis assessing the correlation between demographic variables, using Correlation Tests (Pearson for parametric data and Spearman or Kendall for nonparametric data) and Chi-square test. The ethics committee of Tarbiat Modares University approved the study. All participants will ask for permission and completing the informed consent prior to the study commence.

Discussion

One of the features of this study is to pay attention to the promotion of health in the workplace. This study will investigate the efficacy of interventions for the reduction of LBP in nurses. The main framework of this study will be the theory-driven and evidence-based approach to develop an interactive social media intervention for nurses.

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Moreover, we will execute the In-person intervention. Then we will compare the result of two education methods. Finally, this study will achieve the result of intervention based on interactive social media according to the workload and multiple shifts in the hospitals.

Strengths of this study include the community randomized controlled study design and that the study will be designed and implemented according to specific planning. The interactive social media will provide flexibility and convenience for users, supporting adherence to the program. Also, this study will compare two different educational methods but the same content. One of the concerns will be that participants will not be assessed by a clinician and LBP will commonly be diagnosed through self-report. A second concern, during the course some participants might use pain relief medications which will affect the outcome of the study.

One of the strengths and weaknesses of the study is the 12-month follow-up that brings two concepts: 1. Will education interventions be maintained long-time?

2. Or in the long-time, its effect will be paled?

Trial status

IRCT registration number:
IRCT20170313033054N2
Registration date: 2018-02-25
Recruitment start date: 2018-03-21
Recruitment end date: 2018-05-19

Acknowledgements

The authors will thank the nurses and staff of hospitals of Mazandaran University of Medical Sciences. In particular, educational supervisor, nursing manager, accreditation officer, and nurses in first Phase and nurses participating in the Intervention Phase.

Conflicts of Interests

The authors declare that they have no competing interests.

Ethics Permission

The Tarbiat Modares University of Ethics Committee for Health Research Ethics (IR. TUM. REC. 2017/545) approved the study. Informed consent will be obtained from all participan ts. The data (when ready) will be available from the corresponding author on request.

Consent for publication

Not applicable

Funding Support: The study is funded by a grant from Tarbiat Modares University. The role of the funding body in this study, financial assistance was to collect data.

Authors' contributions

SSK: Collection, analysis, interpretation of data, writing the manuscript, read and approved the final version.

SST: Read and approved the final version.

AM: Analysis, writing the manuscript, read and approved the final version.

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[DOR: 20.1001.1.24765279.2019.4.3.3.5]
[DOI: 10.52547/ijmpp.4.3.211]