



# Effectiveness of Educational Program based on Social Cognitive Theory on Spine Care Behavior in Undergraduate Students: A study Protocol

## ARTICLE INFO

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## ABSTRACT

**Aims:** The spine is one of the most important organs in the human body, playing a vital role in the stability and movement of the body. Inappropriate behaviors such as poor posture, a sedentary lifestyle, and improper backpack use can damage the spine. Social Cognitive Theory (SCT) is a theoretical framework that examines the influence of cognitive, behavioral, and environmental factors on behavior. This study aimed to investigate the effect of SCT-based educational programs on spine care behavior in undergraduate students of Torbat Heydariyeh University of Medical Sciences in 2023-202.

**Method and Materials:** This study will be a randomized controlled trial in which 100 undergraduate students of Torbat Heydariyeh University of Medical Sciences (THMUS) will be randomly assigned to two groups of intervention and control. The intervention group will participate in an SCT-based educational program. The control group will receive no educational intervention. The content of the educational program will include topics such as the importance of spine care, proper posture, physical activity, and proper backpack use. The educational program will be delivered in 10 sessions of 90 90-minute periods. Spine care behavior will be assessed using the spine care behavior questionnaire at two time points before intervention and 6-month follow-up.

**Findings:** The findings of this study are anticipated to suggest that the educational programs will be effective in improving spine care behavior in students. These findings will then be used to design more effective educational programs in this area.

**Conclusion:** This instrument could be applied to evaluate unhealthy behavior due to neck pain and so improve these risky behaviors.

**Keywords:** Spine Care Behavior, Undergraduate Students, Social Cognitive Theory

## Introduction

Spinal disorders and pain are prevalent among adults, estimated to affect 70-80% of people at some point in their lives. Young adult college students, who often spend long hours sitting in a slouched position, are particularly susceptible to developing spinal problems. Dynamic spinal stabilization techniques have been identified as effective in improving spine stability. It is crucial to raise awareness and implement educational programs based on Social Cognitive Theory (SCT) to promote proper spine care behavior among undergraduate students (1, 2). Inactivity and lack of movement, as well as excessive and inappropriate body movements, can lead to an imbalance in flexibility, strength, and muscle

endurance over time (3).

Muscles will not be able to maintain the natural posture of the body, and ultimately, the individual is at risk of physical disorders caused by the postural abnormalities (4). The consequences of neglecting proper spine care can lead to chronic pain, reduced quality of life, and even long-term disability (5). Moreover, the economic burden associated with treating spinal disorders places additional strain on healthcare systems worldwide (6).

Since back pain is also a major cause of disability in adolescents, and the occurrence of back pain at a young age plays a significant role in its incidence in adulthood, enhancing the knowledge and skills of this population would be more important (7-10).

Correct posture is a state of

musculoskeletal balance that has been defined as the minimum amount of tension and load-bearing in the body. The consequences of incorrect body posture can result in physical and spiritual health as well as economic and social aspects of individuals' lives <sup>(11)</sup>. When weak standing and sitting postures are repeated, excessive and prolonged stretching of the innervated soft tissue leads to back pain. In a study, it was reported that symptoms such as pain in the lumbar spine and pelvis are associated with forward head posture <sup>(12)</sup>. Some studies have reported a high prevalence of postural abnormalities in different age groups, especially students, in Iran <sup>(8-10, 13)</sup>. Previous studies in Iran showed a high incidence of spinal abnormalities among students of different universities <sup>(14-16)</sup>.

Spinal care behavior would happen through improving skills and knowledge, self-efficacy, and outcome expectations are the main psychological factors <sup>(17)</sup>. Due to the very high importance of maintaining the health of the spinal column in the general health of individuals, about twenty years ago, schools and training centers called Back schools were established in Sweden, and now they are widely used in Britain, Europe, America, and Australia <sup>(18)</sup> by which applying health-oriented behavior related to the spine is essential for preventing back pain <sup>(19)</sup>. Previous studies showed that awareness of the causes of back pain may help to prevent it early <sup>(20-21)</sup>. Existing evidence found that a 10-week educational program designed to improve teachers' knowledge of proper body posture was effective in improving teachers' knowledge of body posture concepts. However, the researchers noted that teachers did not achieve mastery of all body posture concepts and that they had difficulty making connections between different concepts <sup>(22)</sup>. Another researcher found that regular corrective exercises were effective in reducing spinal abnormalities like lordosis, kyphosis, and scoliosis in adolescents <sup>(23-26)</sup>. Moreover, reported that students with spinal abnormalities were more likely to report musculoskeletal pain <sup>(27-29)</sup>. Although previous studies have shown the benefits of back pain prevention, based on our knowledge, there is

no comprehensive educational curriculum for students in Iran. Implementing a spinal care education program in universities can be very beneficial. The program should also be designed and implemented taking into account risk factors, especially in universities. Awareness of behavioral risk factors can be effective in early prevention. In addition, using learning theories with students can help to make the program effective <sup>(30, 31)</sup>.

Additionally, previous studies showed that a combination of physical function improvement training and posture learning was effective in improving postural alignment, although the effects were not sustained after the intervention <sup>(32)</sup>. These studies suggest that poor posture is a significant risk factor for musculoskeletal pain. Therefore, it is important to teach students about proper posture and how to maintain spine care behaviors. Social Cognitive Theory (SCT) is a theoretical framework that examines the influence of cognitive, behavioral, and environmental factors on behavior. This study aimed to investigate the effect of SCT-based educational programs on spine care behavior in undergraduate students of Torbat Heydarieh University of Medical Sciences (THUMS) in 2023-2024.

### Method and Materials

This study will investigate the effect of an educational program based on SCT on spine care behavior in undergraduate students of THUMS during the academic years 2023-2024. To achieve this objective, a quasi-experimental design will be employed. The target population will consist of undergraduate students enrolled at THUMS.

The sample size is calculated using the following formula:  $n = [(Z_{1-\alpha/2} + Z_{1-\beta})^2 \times (612 + 622)] / (\mu_1 - \mu_2)^2$ , which with considering a 10% dropout, will be 69 participants in each group. In this study, simple random sampling will be used to select the study sample. To do this, a list of classes from each academic major will be prepared; then the classes will be numbered, and the numbers will be placed in a container. An impartial person will randomly remove two numbers from the container. Two classes will

also be assigned to the intervention and control groups by drawing lots. Since individual allocation is not possible in them, the classes of each major will be numbered, and one class from each major will be selected by the lottery method. Then, from the selected class, the eligible students were registered, and based on the population proportion of the class and the sample size, the students for the intervention or control group from the intervention or control classes were selected randomly. Participants will be excluded from the study if they report any back pain, are not regular students at the THUMS, or do not wish to participate in the study.

In this study, an educational program based on the social cognitive approach will be designed and implemented to improve spinal care behavior in undergraduate students. The program includes training on proper lifting and carrying techniques, posture, and backpack-wearing. The intervention group would have positive changes in back-related behavior, knowledge, skills, self-efficacy, and beliefs compared to the control group. Furthermore, it is expected that significant improvements in knowledge, attitude, subjective norms, perceived behavioral control, and behavioral intention will occur. The effectiveness of this educational program will be evaluated using a post-test and a 6-month follow-up through the following phases.

**Phase 1: Identifying educational objectives.** The overall goal of the program is to improve spinal care behavior in the intervention group by modifying the constructs of knowledge, skills, beliefs, and self-efficacy.

**Phase 2: Educational needs assessment.** In this phase, the status of participants will be assessed in terms of the research variables. To this end, a pre-test will be taken. In the pre-test, the mean scores of knowledge, skills, beliefs, and self-efficacy of participants in the intervention group and the control group will be measured.

**Phase 3: Selecting and organizing educational content:** The educational program content will be prepared based on the educational objectives. It will be made to make all the materials and activities available in it

consistent with the general and behavioral objectives.

**Phase 4: Determining the teaching model.** In this phase, frameworks for the activities of the educator and the learner, organizing and presenting materials related to the educational subject, are designed and implemented.

**Phase 5: Selecting educational methods and strategies.** In this phase, appropriate educational methods and strategies will be selected to improve knowledge, skills, beliefs, and self-efficacy. Educational methods for improving knowledge would be through lectures, brainstorming, and question-and-answer. Educational methods for improving skills would be practical demonstration and re-demonstration, substitution and direct experience, and behavior rehearsal. Educational methods for improving beliefs would be role-playing, discussion, and dialogue. Educational methods for improving self-efficacy would be positive feedback, setting small and achievable goals, and providing opportunities for success.

**Phase 6: Writing a lesson plan for each session:** A lesson plan is a general plan and guide for guiding educational activities. In this phase, a lesson plan will be written for each educational session. The lesson plan will include the following educational objectives, educational content, educational methods and strategies, educational activities, and time Program.

In this study, the educational program will be held in eight 90-minute sessions. Each educational session will begin with a warm-up. Then, the educational content will be presented. In the next step, educational activities related to the educational content will be performed. At the end of the session, a summary of the presented materials will be provided.

The effectiveness of the educational program will be evaluated using a post-test and a 6-month follow-up. In the post-test, the mean scores of knowledge, skills, beliefs, and self-efficacy of participants in the intervention and the control groups will be measured.

The data collection tools in this study are a self-report questionnaire and a checklist for evaluating skill performance. The self-report

questionnaire is a tool based on the important constructs of SCT, including knowledge, skills, self-efficacy, outcome expectations, beliefs, and behavior. The program evaluation will be conducted in three phases: The preliminary evaluation will be conducted before the intervention to assess the participants' baseline levels of knowledge, skills, self-efficacy, outcome expectations, beliefs, and care behavior of the spine. The impact evaluation will be conducted after the intervention to assess the effectiveness of the program. Outcome evaluations will be done at a 6-month follow-up. The educational program will be implemented by a team of experienced educators.

The data will be analyzed using SPSS version 19. Descriptive statistics such as frequency distribution and percentage, central, and dispersion indices will be used to describe the data. To ensure the homogeneity of the two groups before the intervention, the Kolmogorov-Smirnov test will be used to check the normality of the data, and the independent t-test or chi-square test will be used to check the equality of means. The normality of the data will be determined by the Kolmogorov-Smirnov test. In addition, to investigate the interaction effect and the main effects of time and group, the repeated measures analysis of variance (mixed model) test will be used.

## Discussion

This study will follow a randomized controlled trial design to assess the effectiveness of the intervention on improvements in knowledge and spine care behavior compared to the control group. It is expected that implementing an educational program based on SCT could effectively enhance spine care behavior in undergraduate students.

The findings from the sources indicate that there is a need for stronger education interventions regarding posture health and knowledge about spine care. The sources also highlight the importance of improving students' beliefs in their ability to practice proper back care behaviors. Overall, these findings emphasize the significance of

adopting and sustaining healthy back care behaviors <sup>(21)</sup>. This educational program will be focused on promoting positive attitudes towards spinal health through various strategies such as providing evidence-based information and interactive discussions. These findings will suggest that the program successfully influenced students' perceptions towards prioritizing and valuing their spinal health.

While this study has its strengths, there are some weak points as follows. Considering the sample size, it might be beneficial to consider a larger sample size to ensure greater generalizability of findings. The study is planned at a single university of THUMS, but including students from diverse universities could provide a more comprehensive picture of the effectiveness of the program across different populations. The effectiveness of the program is assessed only through a 6-month follow-up, but a longer follow-up period could reveal if the educational intervention leads to sustained improvements in spine care behavior. The study relies on self-reported data for both knowledge and behavior, which may interfere with the realities. These limitations can be addressed in future research to be considered.

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## Authors ' Contribution

MHD, FP, KY, and SM performed all study stages and had complete access to all data for analysis. They confirmed the eligibility of the students for the study. MHD was involved in drafting the article. MHD and FP supervised the whole study and approved the final version of the manuscript.

## Conflict of Interests

There is no conflict of interest.

## Ethical Permission

This study was approved by the ethical committee of Torbat Heydarieh University of Medical Sciences through the ethical code of IR.THUMS.REC.1403.001

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