Received: 4 May 2020 | Revised: 30 October 2020 | Accepted: 3 November 2020

DOI: 10.1111/ppc.12685

ORIGINAL ARTICLE

Perspectives in PSYCHIATRIC CARE WILEY

The effects of pain management education on knowledge, attitudes, and beliefs in nursing students in Turkey: A quasi-experimental study

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Abstract

Purpose: The aim of this study is to examine the effects of pain management education on nursing students' knowledge, attitudes, and beliefs concerning pain management in Turkey.

Design and Methods: A quasi-experimental design with pretest/posttest measures was used. The study sample included 79 students.

Findings: The nursing students were found to have enhanced knowledge, attitudes following the initial education, and at the 3-month evaluation, compared to their knowledge and attitudes about pain before the education. However, education had no influence on their organic and psychological beliefs as they did not change across time.

Practice Implications: Pain management education improved the knowledge and attitudes of nursing students. Nurse educators could revise their teaching methods and adopt interactive education methods.

KEYWORDS

attitudes, beliefs, knowledge, pain management, students

1 | INTRODUCTION

Effective pain management is an important part of nursing care and one of the indicators of the quality of care in that it decreases pain, increases the quality of life, prevents complications, accelerates healing, shortens hospital stay, and improves patient satisfaction.[1–3]

Limited knowledge and negative attitudes of nurses are considered as the main barriers to effective pain management.[4,5] Several studies suggest that nurses have inadequate knowledge about pain and inappropriate attitudes regarding pain management.[6–8] However, they should play an essential role in making decisions about pain management since they are the health professionals who spend the most time and interact most frequently with patients.[7]

A nurse's education addresses many important concepts and helps establish practice norms. While nursing students face and offer care to many patients experiencing pain, to be more effective, they should be knowledgeable about assessing and managing pain.[9] Nursing faculty are responsible for preparing students to practice competently in the area of pain management. If students do not acquire profound knowledge about pain assessment and management, they are not prepared to make accurate decisions about pain management.[10]

According to the results of a study by Chan and Hamamura[9] in Hong Kong, nursing students' knowledge and attitudes about pain should be improved. In addition, Chinese nursing students had negative attitudes and insufficient attention to pain management.[11] In a study of final-year nursing students in Turkey, the students had low scores for knowledge of pain. It was emphasized that pain management should be dealt with more extensively in the nursing curriculum.[12] Results of the studies suggest that nursing education about pain management needs to be improved.[9–13]

Nurse educators are responsible for preparing nursing students for pain management before they start to work as a nurse.[14,15] It is important to evaluate nursing students' knowledge and attitudes about pain so that nurse educators can be aware of the students' strengths

and weaknesses regarding pain management.[9] In addition, nurse educators should be aware of modern interactive teaching methods available to teach pain management and facilitators for putting theoretical information into practice, as well as understanding negative attitudes to pain, misconceptions, cultural differences, and social attitudes that interfere with care. This awareness plays an important role in preparing students for the clinical work environment.[15–17]

Beliefs and attitudes of individuals can affect their professional behavior.[18] Pain beliefs are mainly divided into organic and psychological beliefs. Organic beliefs are based on the perception that injuries or damages cause pain, and the more severe an injury, the more severe the pain experienced. Therefore, biomedical thinking, such as controlling activity and exercise and eliminating the condition causing pain, forms the most important aspect of pain management based on organic beliefs. In the case of psychological beliefs, pain originates from psychological factors such as anxiety and depression and can be managed by techniques such as relaxation and distraction.[19,20] It is stated in the literature that the pain beliefs of individuals can affect their strategies for coping with pain as well as their behaviors and attitudes concerning pain and treatment processes. It has been emphasized that offering education based on evaluations of pain beliefs in undergraduate nursing programs may result in more successful pain management outcomes.[21]

The pain beliefs of nurses, who play a key role in a healthcare team, are as important to pain management as the pain beliefs of patients.[21] Nurses' pain beliefs and knowledge of the culture within which their patients experience pain may affect their management of that pain.[22] There have been few studies on the pain beliefs of nursing students.[21,23,24] Insufficient knowledge about pain beliefs has been reported to be the main barrier to appropriate and correct pain management.

Pain assessment and management are intrinsic to nursing care, and teaching strategies that promote effective learning about the complexities of pain management are needed to improve the curricular content.[10] In addition, it is suggested in the literature that interventional studies about active student-centered learning activities are needed.[10] Therefore, the present study was performed to examine the effect of pain management education using interactive education methods on knowledge, attitudes, and beliefs of the nursing students about pain management. Examining the variable's knowledge, attitudes, and beliefs in a new population will contribute to the literature. The results of the study will also provide evidence regarding undergraduate nursing education and pain management in clinics and could contribute to the improvement of patient care outcomes. In addition, they may provide guidance for nurse educators and further studies on the issue.

2 | METHODS

2.1 | Design

The present study has a quasi-experimental design using pretest/posttest measures.

2.2 | Study setting and period

The study was conducted in the health sciences faculty of a university between March and June 2019.

2.3 | Participants

Convenience sampling was used to enroll the participants. The study population comprised 90 second-year students studying in the nursing department in the health sciences faculty during the 2018–2019 academic year. The second-year nursing students did not study anything about pain and pain management in their first year. Four students did not attend the classes and four other students did not attend the first session. The study sample included 82 students before education. One student did not attend the second and third sessions of the education. As a result, 81 students completed their education. Two students did not attend the practicums. Therefore, the study sample comprised 79 students. The students who did not consent to the study received the same educational experiences, but their data were not included in the analysis.

The inclusion criteria:

- accepting to participate in the study,
- not previously having received education about pain.

The exclusion criteria:

- not completing three education sessions,
- not attending the regular practicums of the academic year,
- declining to participate in the study.

2.4 | Procedure

Education about pain and pain management was offered at three sessions, and the following subjects were presented and discussed. *The first session* involved definitions and types of pain, theories of pain, and the physiology and pathophysiology of pain. *The second session* involved postoperative pain and the factors affecting this pain. In addition, physiological and psychological outcomes of postoperative pain experienced by patients were addressed. The section also focused on pain assessment, tools for pain assessment, and pharmacological and nonpharmacological interventions in pain management. *The third session* involved creating a concept map concerning pain management and discussing and roleplaying a pain-related case. The students also shared practicum case studies as well as their experiences of caring for patients with pain. In all the sessions, student-centered interactive education methods such as brainstorming, group work, and roleplays were used (Table 1). A total of 12 h of education was offered, and each session lasted 4 h.

TABLE 1 Content of the pain and pain management education

Education	Teaching and learning activity	Content of education
Session 1 **4 h**	– To enable students to talk about their own pain experiences by using brainstorming and group work – Transfer of theoretical information by using a PowerPoint Presentation	– Definition and types of pain – Physiology and pathophysiology of pain – Theories of pain
Session 2 **4 h**	– Transfer of theoretical information by using a PowerPoint presentation and interactive teaching methods like brainstorming, group work, and roleplays	– Postoperative pain and affecting factors – Physiological and psychological outcomes of postoperative pain experienced by patients – Pain assessment tools and pain assessment – Pharmacological and nonpharmacological interventions for pain management
Session 3 **4 h**	– Creating a concept map about pain management – Discussion and roleplay about a pain related case – Students' sharing practicum case studies as well as their experiences of caring for patients with pain	– Revision of knowledge and skills taught

2.5 | Data collection

The students were given the data collection tools and they were requested to respond to them individually before the education, just after the education, and 3 months after the education. During 3 months after the education, the students attended practicums in a hospital, where they provided care for patients experiencing pain.

2.6 | Data collection tools

Data collection was performed by using the characteristics form of nursing students, the nurses' knowledge and attitudes survey regarding pain (NKASRP),[8,25] and the pain beliefs questionnaire (PBQ).[26]

2.6.1 | The characteristics form of nursing students

Developed by the researchers in light of the literature, this form is composed of nine questions about age, sex, marital status, health problems, medications received, strategies used to cope with pain, sufficient information about coping with pain, and a pain assessment scale.[27,28]

2.6.2 | The nurses' knowledge and attitudes survey regarding pain

The NKASRP was developed by Ferrell et al.[29] in the United States in 1987 to evaluate the knowledge and attitudes of nurses about pain management. The survey was revised in 2014 and reported to be valid and reliable.[30] Its construct validity was achieved by comparing scores of nurses at various levels of expertize, such as students, new graduates, oncology nurses, graduate students, and senior pain experts. It was found to distinguish between levels of expertise. The test–retest reliability of the survey was examined ($r > 0.80$) by repeat testing among staff nurses attending an in-service education program ($n = 60$). Internal consistency reliability was determined (Cronbach's alpha > 0.70).[30]

The survey is composed of 38 items about attitudes to pain management and pharmacological and nonpharmacological approaches. Out of the 38 questions, 22 are true/false, 14 are multiple choice, and 2 are about two case studies, each with two subquestions. Higher scores show appropriate knowledge and attitudes about pain management.[25,29]

The validity and reliability of NKASRP for the Turkish population were tested by Yildirim et al.[8] Linguistic validity and translation-back-translation were used to adapt the survey into Turkish. Cronbach's alpha for the Turkish version of the survey was reported to be 0.74.[8] It was found to be 0.70 in the present study.

2.6.3 | The pain beliefs questionnaire

The PBQ was created by Edwards et al.[31] in the United Kingdom in 1992 to understand the psychological and organic beliefs regarding the causes of pain. The questionnaire is composed of two subscales regarding the sources and treatment of pain: organic beliefs (eight items) and psychological beliefs (four items). Cronbach's alpha was reported to be 0.71 for organic beliefs and 0.73 for psychological beliefs.[31]

The validity and reliability of the questionnaire for the Turkish population were tested by Sertel Berk & Bahadır.[26] Cronbach's alpha was reported to be 0.66 for organic beliefs and 0.71 for psychological beliefs. The test–retest reliability was 0.51 for organic beliefs and 0.74 for psychological beliefs. The questionnaire involves 12 items. Higher scores for each subscale show strong pain beliefs regarding that subscale.[26] As the total score for each subscale of the PBQ increases, the belief that damage and feelings are preventing individuals from controlling their pain experience is stronger.[32]

In the present study, Cronbach's alpha was found to be 0.68 for organic beliefs and 0.82 for psychological beliefs.

2.7 | Data analysis

Data were analyzed by using the Statistical Packages for the Social Sciences 20. The characteristics of the students were examined by using numbers, percentages, and mean values. The repeated-measures analysis of variance with Bonferroni correction was utilized to examine the students' knowledge and attitudes about pain and their organic and psychological beliefs before, just after, and at 3 months after the education.

2.8 | Ethical considerations

Ethical approval was obtained from the ethical committee of the university where the study was conducted (approval number: 2019/84-84), and written permission was obtained from the dean of the health sciences faculty in the university. The participants were given information about the purpose and time of the study and their right to leave whenever they wanted. They were also assured that the data to be gathered would be kept confidential. Then, their written and oral consent was obtained. In addition, permission for use of the NKASRP and the PBQ for the Turkish population was obtained from the authors.

3 | RESULTS

3.1 | Characteristics of nursing students

The mean age of the students was 20.18 ± 1.45 years. Of all the students included in the study, 77.20% were female and 98.70% were single. Also, 82.30% of the students did not have a health problem and 88.60% did not take any medications regularly. Regarding strategies used to cope with pain, 68.40% and 64.60% of the students were found to use analgesics and sleep, respectively. In addition, 73.40% reported not having sufficient information about coping with pain and 40.50% said they rarely used a scale to evaluate pain (Table 2).

TABLE 2 Characteristics of nursing students (*n*: 79)

Item	n (%)
Age	20.18 ± 1.45
Sex	
Female	61 (77.20%)
Male	18 (22.80%)
Marital status	
Married	1 (1.30%)
Single	78 (98.70%)
Health problems	
Yes	14 (17.70%)
No	65 (82.30%)
Taking medications	
Yes	9 (11.40%)
No	70 (88.60%)
Strategies used to cope with pain[a]	
Analgesics	54 (68.40%)
Sleep	51 (64.60%)
Massage	33 (41.80%)
Hot application	20 (25.30%)
Cold application	15 (19.00%)
Having a rest	59 (74.70%)
Herbal alternatives	25 (31.60%)
Smoking	5 (6.30%)
Taking alcohol	3 (3.80%)
Adequate knowledge of coping with pain	
Yes	21 (26.60%)
No	58 (73.40%)
Using a pain assessment tool to assess pain	
Never	20 (25.30%)
Rarely	32 (40.50%)
Sometimes	22 (27.80%)
Always	5 (6.40%)
	79 (100%)

[a]More than one option was marked.

3.2 | Knowledge and attitudes

The mean percentage of the correct answers concerning knowledge and attitudes about pain was 45.85 ± 8.43% before the education, 76.80 ± 10.22% just after the education, and 65.91 ± 10.87% at 3 months after the education, with a significant difference ($p < 0.001$; Table 3). To determine which period created the difference, post hoc pairwise comparisons were made with Bonferroni correction. Since there were three comparisons in the analysis, the *p*-value was divided by 3 (0.05/3), and 0.017 was obtained. The results of the analysis showed a significant difference between the mean scores before the education and those just after the education ($p < 0.001$), between the mean scores before the education and those at 3 months after the education ($p < 0.001$), and between the mean scores just after the education and those at three months after the education ($p < 0.001$; Table 4).

3.3 | Pain beliefs

The mean scores for pain beliefs were compared across time. The mean scores for organic beliefs were 3.32 ± 0.48 before the education, 3.35 ± 0.53 just after the education, and 3.39 ± 0.63 at 3 months after the education, without a significant difference ($p = 0.696$; Table 5). The mean scores for psychological beliefs were 4.63 ± 0.78 before the education, 4.76 ± 0.80 just after the education, and 4.59 ± 0.83 at 3 months after the education, without a significant difference ($p = 0.314$; Table 5).

TABLE 3 The comparison of the nursing students' mean scores for knowledge of and attitudes to pain across time

Nurses' knowledge and attitudes survey regarding pain	Before education *M* ± *SD*	Just after education *M* ± *SD*	Three months after education *M* ± *SD*	*F*	*P**
Knowledge and Attitudes	45.85 ± 8.43	76.80 ± 10.22	65.91 ± 10.87	191.434	0.000

Note: M is the overall percentage of correct answers and *F* is the repeated-measures analysis of variance with Bonferroni correction.
Abbreviation: *SD*, standard deviation.
*$p < 0.05$.

4 | DISCUSSION

4.1 | Knowledge and attitudes

What determines nurses' approaches to pain management and assessment is their knowledge, attitudes, and beliefs.[33] In the present study, the mean percentage of nursing students for knowledge and attitudes before education was found to be 45.85%. This shows that the students had inadequate knowledge and inappropriate attitudes about pain and its management, which is consistent with the literature.[11–13,34,35] In the current study, the nursing students were found to have enhanced knowledge and attitudes just after the education (76.80%) and at 3 months after the education (65.91%) compared to their knowledge and attitudes before the education (45.85%). The lower score for knowledge and attitudes at 3 months after the education compared to the score just after the education suggests the effect of education on knowledge and attitudes. The decrease in the mean scores of knowledge and attitudes can be attributed to the temporal effect on memory. In a comparative study with students in a nursing school in Texas, knowledge and attitudes were shown to differ between three levels of students: first-semester juniors (59.65%), second-semester juniors (61.23%), and first-semester seniors (67.67%). The mean score for knowledge and attitudes increased after education.[36]

In a study with preregistration nursing students (Bachelor of Science in Nursing) and practical nursing students at four education sites in two postsecondary institutions in Canada, the students were found to have major gaps in knowledge and attitudes related to understanding the risk of respiratory depression after opioid therapy, calculating medication dosages, administering medication, and understanding pharmacology. The students did not have sufficient knowledge and positive attitudes about pain assessment and management. Nurse education was reported to influence the mean scores for NKASRP.[13] Keefe and Wharrad[37] in the United Kingdom evaluated the effect of an e-learning intervention on pain management education. They found that the mean score of the intervention group was 73.06%, suggesting that the e-learning intervention is useful in the pain management education of nurses. It is essential that an extensive knowledge base should be created for undergraduate nursing education to improve learning and that this should be utilized in clinical practice.

In the present study, the nursing students had a higher score for knowledge and attitudes after education (76.80%), but their scores slightly decreased after their practicums (65.91%). This decrease can be explained by a temporal effect on knowledge. It can be recommended that vertical and horizontal integration of pain management into different courses should be performed to achieve long-term retrieval of the knowledge acquired and to avoid a decrease in knowledge. In addition, students should be provided opportunities to discuss pain management of the patients they provide care for during practicums to enable them to record the knowledge in their long-term memory and to maintain their positive attitudes.

TABLE 4 Further analysis of the nursing students' mean scores for knowledge of and attitudes to pain across time

Pairwise comparison	Mean paired difference ± *SE*	95% Confidence interval for the difference		*p*[a]
		Lower bound	Upper bound	
1–2	−30.94 ± 1.57	−34.80	−27.09	0.000
1–3	−20.06 ± 1.57	−23.91	−16.21	0.000
2–1	30.94 ± 1.57	27.09	34.80	0.000
2–3	10.88 ± 1.66	6.81	14.95	0.000
3–1	20.06 ± 1.57	16.21	23.91	0.000
3–2	−10.88 ± 1.66	−14.95	−6.81	0.000

Note: 1: Before education, 2: Just after education, and 3: 3 months after education.
[a]Repeated measures analysis of variance with Bonferroni correction.

TABLE 5 The comparison of the nursing students' mean scores for pain beliefs across time

	Before education *M ± SD*	Just after education *M ± SD*	Three months after education *M ± SD*	*F*	*p**
The pain beliefs questionnaire					
Organic beliefs	3.32 ± 0.48	3.35 ± 0.53	3.39 ± 0.63	0.363	0.696
Psychological beliefs	4.63 ± 0.78	4.76 ± 0.80	4.59 ± 0.83	1.164	0.314

Note: F is the repeated-measures analysis of variance with Bonferroni correction.
Abbreviations: *M*, mean score; *SD*, standard deviation.
**p* > .05.

4.2 | Pain beliefs

In the current study, the education given did not have an influence on the nurses' organic and psychological beliefs, which did not change across time. In a randomized controlled study performed to evaluate the efficacy of a culture-sensitive and standard pain neuroscience education program, the education program did not create a significant group-by-time interaction effect regarding the PBQ organic and psychological scores.[38] A randomized controlled study with patients and nurses in The Netherlands showed that postoperative pain education enhanced knowledge and beliefs.[39] A study from Canada revealed that the continuing pain education offered to health professionals giving long-term care did not influence their organic beliefs.[40] Organic pain beliefs contribute to the perception that pain is harmful and impossible to control.[32] It has been stated that organic beliefs are associated with physical functioning and that as organic pain beliefs decrease, physical functioning is observed to increase.[20] Therefore, the students' low score for organic beliefs (3.32 ± 0.48), which was not affected by the education in the present study, may demonstrate positive attitudes in the students that may contribute to effective pain management.

Kennedy et al.[24] in their study of healthcare students at a university in Ireland discovered that nursing students' beliefs and attitudes about lower back pain did not differ from the other students; however, physiotherapy students had more positive beliefs than medical students and nursing students. These differing attitudes and beliefs may be rooted in a number of factors, including the level of pain knowledge. Babadağ and Alparslan[21] performed a descriptive study in nursing students in Turkey and reported scores for organic (3.46 ± 0.51) and psychological (4.81 ± 0.76) beliefs that are similar to the present study. The students' pain beliefs were reported to change in accordance with sociodemographic features and pain-related variables.[21] Another study with nursing students revealed that the age of the student had a relationship with their psychological beliefs and that with increased age, pain can be due to psychological factors such as anxiety and depression.[41] According to a study of healthcare students attending a 2-year university program in Turkey, no significant difference was found in the organic and psychological beliefs between child development and care students who did not receive education about pain, and physiotherapy assistants and students, paramedic students, and elderly care students who were offered education about pain.[23] Psychological beliefs deal with the effects of psychological factors in pain experiences. To exemplify, feeling anxious and constantly thinking about pain increase perceived pain. It is known that relaxation and using distraction can be effective in pain management.[19,20] Therefore, in the present study, the low scores of the students for psychological beliefs before and after the education indicate that they had a positive attitude and were aware of the role of nonpharmacological interventions in pain management.

5 | LIMITATIONS

Since the study was performed with second-year nursing students at a university in Middle Anatolia, Turkey, its results cannot be generalized to all nursing students. Another limitation of the study is that since all the second-year students were included in the study, there was no control group.

6 | CONCLUSION

Using oral presentations and interactive methods can be associated with increasing scores related to the knowledge and attitudes of the students regarding pain and pain management. Offering pain management education by using a sufficient variety of educational methods and allocating adequate time for this education may play an important part in improving knowledge and attitudes.

In the present study, the students received low scores for pain beliefs, which remained the same after education. This suggests that the students may use nonpharmacological methods in pain management, such as imagining and distraction in addition to pharmacological methods. Using nonpharmacological options may have a positive effect on patients and help them become involved in their pain control. Offering pain management education by evaluating pain beliefs may help to obtain more favorable outcomes.

7 | IMPLICATIONS FOR NURSING PRACTICE

Shortcomings in pain education in nursing programs may result in low-quality pain management performed by nurses. Interactive education methods could be used to provide students with effective

and accurate theoretical information about pain management that could be used in practice.

It can be recommended that pain management education should be given after students' knowledge, attitudes, and beliefs about pain have been evaluated so that they can be given the pain management knowledge they need. In addition, nurse educators could use student-centered interactive education methods for pain management. Students can be encouraged to use pain assessment tools in their routine clinical practice. Further studies should focus on comparisons of different interactive teaching methods and examine their effects on students' knowledge, attitudes, and beliefs.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

ETHICS STATEMENT

Ethical approval was obtained from the ethical committee of the university where the study was conducted (approval number: 2019/84-84), and written permission was obtained from the dean of the health sciences faculty in the university.

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How to cite this article: Erol Ursavaş F, Karayurt Ö. The effects of pain management education on knowledge, attitudes, and beliefs in nursing students in Turkey: A quasi-experimental study. *Perspect Psychiatr Care*. 2021;57:499–506. https://doi.org/10.1111/ppc.12685