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Original research article

Non-pharmacological interventions for pain management used by nursing students in Turkey

Neziha Karabulut [a] **, Dilek Gürçayır* [a], *Yeşim Yaman Aktaş* [b]

[a] *Atatürk University, The Faculty of The Health Sciences, Department of Surgical Nursing, Erzurum, Turkey*
[b] *Giresun University, The Faculty of The Health Sciences, Department of Surgical Nursing, Giresun, Turkey*

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ABSTRACT

Aim: The use of non-pharmacological techniques for pain relief is increasing among nursing students, because pain is a significant problem that affects the quality of life and everyday activities. The aim of this study was to examine the types of pain experienced by nursing students and the non-pharmacological methods they used to relieve them in Eastern Turkey.
Methods: A descriptive survey design was used. This study was carried out in the nursing department of Atatürk University in Erzurum, Turkey. The sampling consisted of 388 students who agreed to participate in the research in the 2010–2011 academic spring term. The data was collected using a questionnaire, which included the demographics of nursing students, questions regarding the types of pain experienced by the students, and the non-pharmacological methods they used in pain control.
Results: Of the 388 students surveyed, 92% experienced pain and 69.1% experienced mostly gastrointestinal symptoms. The types of pain experienced by the students were back and waist (59.3%), throat (45.6%), dysmenorrhoea (44.6%), toothache (41%), neck (33.5%), and tension headaches (33%). The non-pharmacological methods most frequently used were heat application, resting in a dark room, massage, drinking hot herbal beverages, and cold application.
Conclusion: Our conclusion is that students frequently use non-pharmacological interventions. Therefore the nursing education curriculum should include updated information about the use of non-pharmacological interventions and their usefulness.

Introduction

The word pain, derived from the Latin word "poena" (which means punishment or torment), is a complicated concept [1]. Pain is a responsive mechanism whose role is to protect an organism from damage. Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage [2]. Pain decreases the quality of life with its physical, mental and social effects. Therefore it is vital that those in the medical profession can keep the pain under control. According to a study about the uses

* **Korespondenční autor:** Neziha Karabulut, PhD, Atatürk University, The Faculty of The Health Sciences, Department of Surgical Nursing, 25240 Erzurum, Turkey; e-mail: nezihekarabulut@hotmail.com; nezihek@mynet.com
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of non-pharmacological and pain control, at least 94.3% of nursing students have experienced pain that requires treatment at least once in their life [3]. This pain makes their sleeping patterns irregular, it affects their social life, their everyday activities, their concentration and their performance at school. Therefore it is hugely important to control the pain experienced by individuals in order to elevate their quality of life and reduce any additional complications [3, 4].

Currently, the most common way of controlling pain in Turkey is the use of pharmacological methods. Analgesic treatment is the most common method used to alleviate pain as it takes effect more rapidly and is easy to apply. However, intensive usage of analgesics can have negative implications. Analgesics can negatively affect some physiological functions, and inappropriate usage of analgesics puts a burden on the country's economy as well as the individual [5, 6]. Non-pharmacological methods have also been used as alternatives in the treatment of pain, the goal being to increase the individual's experience of well-being [7]. Non-pharmacological interventions are recognized as a valuable, simple, and inexpensive alternative to pharmacological approaches to pain management [8]. These strategies include stimulation methods (e.g. massage, heat or cold packs, transcutaneous nerve stimulation), cognitive-behavioural methods (e.g. meditation, relaxation techniques, hypnotherapy, music therapy, biofeedback) and other methods (e.g. acupuncture, acupressure) [9, 10].

Pain management is an integral job function of the licensed nurse [11]. Nursing students are taught about pain and the non-pharmacological methods available for pain control during courses in occupational nursing, physiology, and pharmacology. It is very important for nursing students to possess knowledge about the non-pharmacological methods used for pain and pain control and to practice delivery of these methods [3]. Cason et al. suggest that inadequate pain relief may stem from nurses' lack of appropriate pain management education in nursing school [12]. Few studies regarding students' knowledge of pain management have been conducted in nursing schools. However, inadequate knowledge of pain and how to manage it has been noted in various published studies [11, 13]. Lofmark et al. [14] noted that in a sample of nursing students (n = 32), two-thirds were unable to complete a systematic pain assessment, and approximately half of the students re-evaluated the effect of suggested interventions for pain-relief.

Background

Nurses have a key role in effective pain management. A nurse's accurate assessment, prompt pharmacological or non-pharmacological intervention, and evaluation of pain relief administered are necessary for positive outcomes in patients and the maintenance of health [11]. There is no universal definition or classification accepted for non-pharmacological methods in health practices. These methods are specified using terms such as alternative methods, complementary methods, non-pharmacological and non-invasive ones [2]. Complementary and alternative medical (CAM) therapies are "a diverse group of medical and health care systems, practices and products that are currently not considered to be part of conventional medicine. Also, their strategies have not met the standards of clinical effectiveness". A complementary therapy is used alongside conventional treatment, but an alternative therapy is used instead of conventional treatment [15].

Although complementary and alternative therapies are now widespread throughout the world, publications related to therapies used by nurses or nursing students in their lives or in patient care are very limited [16]. A total of 272 medical school students were surveyed to assess whether they use alternative therapies [17]. The results indicated that the majority of students (73.5%) used at least one CAM therapy. In Turkey, despite widespread consumer use, there have only been two studies of nursing students on CAM. In one study related to nursing schools, Öztekin et al. [18] surveyed 640 nursing students, and noted that approximately half of the students used alternative therapies, which included massage, music therapy, and nutritional therapy. A previous study conducted by Uzun and Tan [19], which dealt with nursing students' (n = 276) knowledge of CAM therapies, found that students held positive opinions about CAM therapies, but their personal knowledge of them was limited. A number of studies have reported that nursing students use non-pharmacological interventions for pain relief and are willing to learn about these methods of treatment [3, 20, 21]. In a study involving nursing students in Turkey it was noted that there is insufficient knowledge of non-pharmacological methods. In order to assess their knowledge and use of non-pharmacological methods, a total of 244 nursing students were surveyed [3]. The results indicated that 15.4% of them used resting or sleeping to relieve pain, 15.1% heat packs, 13.2% distraction, 6.3% massage, 5.4% cold packs, 3.5% music therapy, and 1.3% relaxation techniques, all of which are non-pharmacological pain management. In another study, Yılmaz et al. [21] surveyed 358 nursing students in Turkey. They found that 35.7% of them used massage to relieve pain, 32.2% used herbal medicine and 22.6% used music therapy. Sawalha et al. [22] reported that the students experienced various types of pain, such as headaches, flu, menstrual pain and sore throats. 32.7% of them used two or more types of herbal medicine. Nursing students who learn to manage their pain through non-pharmacological methods can treat their patients' pain more effectively.

In Turkey, there are limited studies related to the types of pain experienced by nursing students and the non-pharmacological intervention they use to control it [3, 21]. Nursing students' knowledge and attitudes to pain have been well documented [11, 13, 14], but less is known about the kinds of pain nursing students experience. The purpose of our study was to determine the types of pain experienced by nursing students in Eastern Turkey, and to explore the non-pharmacological methods they use for pain relief.

Materials and methods

Design and sample

A descriptive survey design was used to determine the types of pain typically experienced by nursing students and the non-pharmacological methods they used to control it. This study was carried out in the nursing department of Atatürk University in Erzurum, Turkey. The School of Nursing awards students a nursing license diploma after four years of education. The research study group consisted of 569 students who were attending classes in the 2010–2011 academic spring term. The sampling consisted of 388 students who agreed to participate in the research.

Questionnaire

The questionnaire used in the study was prepared by the researchers after a literature review [3, 21, 23, 24]. The questionnaire consisted of two sections. Part 1 included questions related to the nursing students' socio-demographic characteristics (e.g. age, gender, class, place of residence, experience of pain). Part 2 included questions related to the types of pain the students experienced and the non-pharmacological methods they used for pain relief. The types of pain experienced by the students during their nursing education were obtained through closed questions (yes/no). The non-pharmacological methods they used for pain relief were obtained by open-ended questions.

Data collection

After obtaining the approval of the ethics committee, in order to survey their students verbal permission was also obtained from the lecturers responsible for courses in medical surgical, fundamental, public health, and paediatric nursing. The procedures of the study were explained to all participants, and they gave their informed consent before participating. At the end of each lesson, adequate time was given for them to respond to the questionnaire.

Data analysis

For data entry and analysis, the Statistical Package for Social Sciences (SPSS, Chicago, IL) Windows version 16.0 was used. Statistics were presented with percentage distribution, mean, and standard deviation.

Ethical consideration

Ethical approval was obtained from the Atatürk University Research and Ethics Committee. Written approval for data collection was obtained from the Dean of the Faculty of the Health Sciences. Participants were provided with an information sheet about the study and verbal consent was obtained. The aim of the study was explained to the students and their participation was voluntary. Respondents were offered confidentiality and anonymity, which was guaranteed by the absence of identifying marks or numbers on the questionnaires.

Results

The demographic characteristics of the nursing students are shown in Table 1. Three hundred and eighty-eight (388) nursing students completed the questionnaire. The mean age of the students was 21.3, with a standard deviation of 1.83. Approximately 74.5% (289) of the sample were female. Of the participants, 93 (24%) were first-year students, 92 (23.7%) were second-year students, 111 (28.6%) were third-year students and 92 (23.7%) were fourth-year students. Ninety-two percent of the students (n = 357) indicated that they had experienced pain during their nursing education.

Table 1 – Demographic characteristics of nursing students (n = 388)

Age, years (mean ± SD)	21.27 ± 1.83	
	n	%
Gender		
Male	99	25.5
Female	289	74.5
Class		
First class	93	24.0
Second class	92	23.7
Third class	111	28.6
Fourth class	92	23.7
Place of residence		
Eastern Anatolia Region	111	28.6
Central Anatolia Region	67	17.3
Black Sea Region	56	14.4
Mediterranean Region	47	12.1
South-eastern Anatolia Region	46	11.9
Aegean Region	33	8.5
Marmara Region	28	7.2
Pain experienced (during nursing school)		
Yes	357	92.0
No	31	8.0

Table 2 – Types of pain that nursing students experienced

Pain types	*n*	%
GI symptoms	268	69.1
Back and waist pain	230	59.3
Throat pain	177	45.6
Dysmenorrhoea	173	44.6
Toothache	156	40.2
Neck pain	130	33.5
Tension headache	128	33.0
Muscle-joint pain	88	22.7
Migraine	79	20.4
Earache	56	14.4
Trauma pain	29	7.5
Kidney pain	21	5.4
Varicose vein pain	6	1.5

Given more than one answer.

Types of pain experienced by the students

An examination of the types of pain students experienced revealed that 69.1% of them experienced gastrointestinal (GI) symptoms, 59.3% back and waist pain, 45.6% throat pain, 44.6% dysmenorrhoea, and 41% toothache. Varicose vein pain (1.5%), kidney pain (5.4%) and trauma pain (7.5%) were among the least experienced types of pain (Table 2). Statistical analysis showed no significant differences between nursing students' experience of pain and their age ($t = -1.258$, $p > 0.05$), gender ($t = -6.343$, $p > 0.05$), and class ($F = 2.328$, $p > 0.05$).

Non-pharmacological methods used by nursing students for pain relief

Table 3 shows the non-pharmacological methods used by nursing students. Around 60% of the students experiencing back and waist pain, 46.6% experiencing GI symptoms, 44.3% with throat pain, 42.1% experiencing dysmenorrhoea, 67.4% experiencing neck pain, 49.2% experiencing tension headaches and 58% of the students experiencing muscle and joint pain stated that they used non-pharmacological methods to relieve their pain.

Table 3 – The methods used by nursing students to relieve their pain

Pain types		*n*	%
GI symptoms	No application	67	25.0
	Pharmacological methods	45	16.7
	Non-pharmacological methods	125	46.6
	Pharmacological – non-pharmacological methods	31	11.5
Back and waist pain	No application	47	20.6
	Pharmacological methods	17	7.3
	Non-pharmacological methods	140	60.8
	Pharmacological – non-pharmacological methods	26	11.3
Throat pain	No application	64	35.8
	Pharmacological methods	20	11.4
	Non-pharmacological methods	78	44.3
	Pharmacological – non-pharmacological methods	15	8.5
Dysmenorrhoea	No application	27	15.2
	Pharmacological methods	35	19.7
	Non-pharmacological methods	75	42.1
	Pharmacological – non-pharmacological methods	41	23.0
Toothache	No application	63	39.9
	Pharmacological methods	72	45.6
	Non-pharmacological methods	14	8.9
	Pharmacological – non-pharmacological methods	9	5.7
Neck pain	No application	17	13.2
	Pharmacological methods	14	10.9
	Non-pharmacological methods	87	67.4
	Pharmacological – non-pharmacological methods	11	8.5
Tension headache	No application	14	11.3
	Pharmacological methods	29	23.4
	Non-pharmacological methods	61	49.2
	Pharmacological – non-pharmacological methods	20	16.1
Muscle-joint pain	No application	23	26.1
	Pharmacological methods	9	58.0
	Non-pharmacological methods	51	58.0
	Pharmacological – non-pharmacological methods	5	5.7
Migraine	No application	8	10.3
	Pharmacological methods	22	28.2
	Non-pharmacological methods	21	26.9
	Pharmacological – non-pharmacological methods	27	34.6

Non-pharmacological methods used by nursing students according to the types of pain they experienced

Table 4 shows the non-pharmacological methods used by nursing students in relation to the types of pain they experienced. When the non-pharmacological methods used to relieve pain were examined, it was found that 23% of students experiencing *GI symptoms* used heat packs and 6.7% changed their diet. Almost 20% of students experiencing *back and waist pain* rested by lying on their backs, 12.8% used massage therapy, and 11.9% used heat

Table 4 – Non-pharmacological methods used by nursing students in relation to the types of pain they experienced

Type of pain	Non-pharmacological methods	*n*	%
GI symptoms	Heat packs	90	23.0
	Diet[a]	26	6.7
	Herbal medicine	12	3.2
	Massage therapy	10	2.6
	Sleeping	8	2.1
	Music therapy	1	0.8
Back and waist pain	Resting and lying on their backs	74	19.2
	Massage therapy	49	12.8
	Heat packs	46	11.9
	Exercise	20	5.1
	Cupping/manipulative therapy	2	0.6
Throat pain	Herbal medicine[b]	87	22.6
	Heat packs	14	3.6
Dysmenorrhoea	Heat packs	110	28.4
	Resting	21	5.4
	Massage therapy	5	1.3
Toothache	Rinsing their mouths with salted water	14	3.7
	Applying alcohol-cotton	6	1.5
	Cold packs	6	1.5
Neck pain	Massage therapy	56	14.4
	Exercise	34	8.8
	Heat packs	34	8.8
Tension headache	Resting in a quiet dark room	66	17.0
	Massage therapy	10	2.6
Muscle-joint pain	Cold packs	29	7.5
	Heat packs	20	5.2
	Massage therapy	13	3.4
	Exercise	6	1.6
	Resting	4	1.0
Migraine	Resting in a quiet dark room	59	15.2
	Massage therapy	9	2.3

[a] Avoiding spicy bitter foods and fizzy beverages.
[b] Drinking tea with lemon, milk with honey, herbal teas.

packs. 22.6% of participants experiencing *throat pain* drank herbal tea in order to relieve it, while 3.6% used heat packs. Around 30% of those who experienced *dysmenorrhoea* used heat packs on their abdominal region. 14.4% of students experiencing *neck pain* used massage therapy, 8.8% exercise, and 8.8% applied heat packs. In order to relieve the pain, 17% of participants experiencing *tension headaches* rested in a dark room, and 7.3% of students experiencing *muscle-joint pain* used cold packs.

Discussion

Non-pharmacological methods are commonly used as complementary methods in the treatment of pain worldwide [7]. However, studies relating to non-pharmacological methods used by nursing students in Eastern Turkey are limited.

In this study we examined the non-pharmacological methods used by nursing students to relieve pain. The students reported that they mostly experienced GI symptoms, back and waist pain, throat pain and dysmenorrhea. The majority of these students stated that they used non-pharmacological methods to relieve the pain.

This study found that 69.1% of the students experienced GI symptoms (the symptoms may have psychological or physiological roots). The stress caused by a rigorous nursing program in addition to local environmental factors could cause stomach pain. The fact that the students have left their home to live in a boarding house, are now away from their homes and social support systems, and the resulting changes in their nutritional habits, could cause GI symptoms.

It was also found that students used non-pharmacological methods to relieve GI symptoms, such as applying heat packs to their abdominal region, altering their diet (e.g. avoiding eating spicy and bitter foods, not drinking fizzy beverages) and drinking herbal tea.

A study carried out by Lee et al. [25] showed that nursing students experience a number of GI symptoms, such as heartburn, distension, nausea and vomiting. GI symptoms

appeared in 51.2% of 127 Canadian university students, and 64.2% of 668 university students in Switzerland [26, 27]. The findings in literature are in accordance with our findings [25, 26, 27].

A number of studies carried out among nursing students and working nurses showed common occurrences of muscle and neck pain as well as back and waist pain [28, 29, 33].

In this study, 59.3% of students experienced back and waist pain. Similarly, a study by Lövgren et al. [29] and another study by Barnes [34], showed that the number of students participating in the study that experienced waist pain was 49% and 34% respectively. According to Cheung's research results [35], back and waist pain among working nurses can be traced back to their school years. In this study, the rate of neck pain was 33.5% which has been found in the literature [29, 32]. More than half of the students (60.8%) who experienced back and waist pain, and 67.4% of the students who experienced neck pain used non-pharmacological methods to relieve the pain. When students were asked which non-pharmacological methods they used to relieve their back and waist pain, they responded that they used exercise, heat packs and massage therapy. In the literature, methods such as massage, heat packs and exercise were among the physical treatments used to treat these types of pain [36]. This complies with Dannecker et al. [37], who state that university students mostly used massage and stretching exercises to relieve muscle and joint pain. Stewart and Cox-Davenport [38] compared a group of nursing students' (n = 64) use of non-pharmacological methods of pain management with those of practicing registered nurses (n = 49). The non-pharmacological methods most commonly used by the nursing students were deep breathing (23%), application of heat packs or cold packs (17%) and massage (9%). When the literature was investigated, it was determined that topical heat application is a reliable non-pharmacological method used for back and waist pain [39, 40, 41].

This study was conducted using a group of students in a unique climate and geographical zone. The altitude in this region is 2,000 metres above sea level, the temperature is often very low and the winter tends to last for 8 months. This increases students' susceptibility to colds and flu. The winter is long, and coal stoves are used, therefore dry air and air pollution can cause throat pain. It was found that 45.6% of students experienced throat pain. The students stated that they used non-pharmacological methods, such as herbal medicine (e.g. drinking tea with lemon, milk with honey, hot herbal tea) in order to augment immune resistance. They also used heat packs or kept warm by wearing woollen fabrics around their necks to relieve throat pain.

On average, spasmodic dysmenorrhoea starts 12–24 hours before vaginal bleeding, and ends after 48–72 hours. Congestive primary dysmenorrhoea starts a day prior to menstruation [42]. The pain decreases the individual's quality of work, sometimes resulting in absence from work or school, and some students drop out [43, 44]. This study found that 44.6% of the female students experienced dysmenorrhoea. A number of studies carried out at home and abroad have pointed out that female students experienced dysmenorrhoea at a high rate [20, 45–51]. In the treatment of dysmenorrhoea, some non-pharmacological methods (including heat packs, exercise, sleep and refocusing of attention) may be adequate to relieve the pain [52]. In this study, it was found that 42.1% of the students used non-pharmacological methods to relieve dysmenorrhoea, while 23% used non-pharmacological methods alongside pharmacologic methods. A study by Turan and Ceylan [53] reported that 42.1% of students with dysmenorrhoea used analgesic drugs, while 19.9% applied heat packs. Ersun and Zaybak [44] stated that 76.7% of the students used analgesic drugs to relieve their pain, while 23.3% tried to reduce the pain by changing their position and applying heat packs. Similar findings were noted in another study involving 315 nursing students in Turkey [20]. The most common non-pharmacological methods reported were resting (65.1%), applying locally heat packs (63.2%), taking an analgesic (54.6%), massage (34.3%) and drinking herbal tea (32.4%). This study found that students mostly used heat packs to reduce dysmenorrhoea. It is fair to say that heat packs stimulate the gate control mechanism and enable vasodilatation, reducing ischemic pain and removing metabolic waste, thus increasing the release of endorphins and providing sedation and relief. As a result, heat packs relieved the pain [54].

Gingival diseases and decayed teeth may cause pain. The students stated that they experienced toothache because they postponed going to the dentist. In this study, 40.2% of students stated that they experienced toothache. 45.6% preferred pharmacological methods, while 8.9% used non-pharmacological methods to treat the pain. The non-pharmacological methods used for toothache are applying alcohol using cotton or applying cold to the affected area. Berg et al. [55] surveyed 549 nursing students to find out about their most painful experiences. They reported that 28 nursing students experienced toothache that caused acute pain.

Headaches have been one of the most commonly experienced ailments throughout human history [56]. When headaches among the students were examined, 33% of students stated that they experienced tension headaches and 20.4% experienced migraines. A study carried out by Kurt and Kaplan [56] stated that 22.6% of university students experienced tension headaches, while 17.8% experienced migraines. Souza et al. [23] observed that 50.2% of nursing students experienced headaches. Üstüner Top et al. [24] stated that 51.4% of the nursing students experienced tension headaches and 46.1% of these students experienced migraines. The most commonly used non-pharmacological methods reported by the students (n = 243) were sleeping (81.1%), massage therapy (50.6%), resting in a dark room (39.1%), praying (20.2%) and cold packs (8.2%). In this study, we found that resting in a dark and quiet room was the most commonly used non-pharmacological method to relieve a headache. The stimulants causing the pain were reduced in the dark and quiet room, hence contributing to the pain relief [57, 58].

Limitations of the study

This study contains several limitations. The study only included nursing students in Eastern Turkey, and may not accurately reflect nursing students in other cities and countries. The authors also acknowledge that the sample was limited to those students who were in the designated classes. The results obtained are based on nursing students' self-reports. This study ensures a comprehensive description of nursing students' experience of pain and their use of non-pharmacological methods in pain management. In addition, this study provides useful information in terms of demonstrating nursing students' experiences of pain and the methods used to cope with it.

Conclusion

Controlling pain is important to relieve the individual, increase the quality of life, reduce complications and in allowing individuals to perform everyday activities. The data indicates that the majority of nursing students experience different types of pain during their nursing education, and use non-pharmacological interventions to relieve it. The data also highlights the importance of emphasizing non-pharmacological pain management in the nursing curriculum.

Studies like this one are vital to our future understanding of nursing practices, because the choices nurses and nursing students make in treating their own pain will affect the treatment of pain in patients. As well as being easily applicable and cost effective, the effectiveness of non-pharmacological methods increased when used alongside pharmacological methods. For these reasons, information about non-pharmacological methods and their uses and usefulness should be added to the nursing education curriculum. Knowledge about non-pharmacological methods should be updated for nurses in postgraduate service training programmes. Nursing textbooks and other resources should be reviewed for current evidence-based practices on pain management. Students should also be provided with appropriate clinical learning environments and role models who reinforce essential pain management knowledge and practices.

Conflict of interest

The authors have no conflict of interest to disclose.

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