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ASSESSMENT OF NURSING STUDENTS' KNOWLEDGE AND ATTITUDES ABOUT PAIN: A PILOT PROJECT

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ABSTRACT

Background: Pain is a subjective sensory and emotional experience that significantly affects patients' quality of life. Within the multidisciplinary team, nurses are responsible for pain assessment and management. During undergraduate studies, nursing students take a variety of classes that teach about pain. Having an adequate amount of knowledge is essential for planning and carrying out the appropriate intervention for pain management. For that reason, this study aims to assess the nursing student's knowledge and attitudes regarding pain.

Methods: A pilot study was conducted among second and third-year nursing students at the University of Applied Health Sciences Zagreb, Croatia, during the academic year 2024/2025. The instrument used was based on the Knowledge and Attitudes Survey Regarding Pain tool (KASRP). Socio demographic data were collected as well. The collected data was analyzed using descriptive and inferential statistics.

Results: A total of 56 questionnaires were collected (32% response rate). Results showed that nursing students do not have an adequate level of knowledge regarding pain. For the entire questionnaire, the mean correct score was 64.08% (SD= 3.18). There were no significant differences in the number of correct answers between students with and without work or clinical experience ($p>0.05$). Furthermore, there was no statistically significant difference in the number of correct answers between second and third-year nursing students ($p > 0.05$).

Conclusion: Nursing students demonstrated insufficient knowledge and attitudes regarding pain assessment and management. These findings are important and should serve as an incentive for further research on a larger sample of participants, with the aim of obtaining evidence necessary for improving basic and continuing education of nurses, thereby enhancing the quality of pain management.

Keywords: *attitude, knowledge, nursing, pain, students.*

INTRODUCTION

Pain is a personal experience that can be affected by different degrees of various factors. These factors include biological, psychological, and social elements. The International Association for the Study of Pain (IASP) defines pain as an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage. The IASP also expands upon the definition by the addition of six keynotes and the etymology of the word pain for further valuable context (1). Chronic pain represents a particular public health and global problem. It has been estimated that between 20-50% of people suffer from chronic pain globally and that the prevalence of chronic pain in children and adolescents is about 20.8% (2-7). Given the high prevalence of chronic pain, effective pain management remains a critical challenge in healthcare systems worldwide. Several studies show that challenges for effective pain management include limited knowledge, negative attitudes towards pain, and insufficient documentation skills (8-10).

Nurses assess and manage the patient's pain on a daily basis. Therefore, the effectiveness of pain management depends on nurses (11-12). Adequate levels of knowledge are crucial for planning the right interventions that include pain management methods (11). However, studies have shown that nurses have

inadequate knowledge and attitudes regarding pain (13-16). Studies focusing on nursing students' knowledge and attitudes regarding pain have also shown insufficient knowledge and negative attitudes towards pain, pain assessment, and pain management (11-12, 17-23).

Education regarding pain should be received by all nurses in their undergraduate studies, because pain assessment and management are part of daily patient care. As part of their education program, nursing students learn about pain through a series of courses in the field of nursing care, as well as in courses related to health psychology, medical courses, and pharmacology. They also have clinical placements across a variety of healthcare settings and diverse working environments. In addition to the mandatory courses, they have the option of choosing an elective course in Pain Therapy in the second year of study. The undergraduate nursing studies in Croatia is a three-year program that should prepare students for nursing work. For that reason, evaluating their knowledge and attitudes regarding pain is important as they should be prepared to execute adequate interventions for pain management. It appears that there have been no other studies conducted to examine undergraduate nursing students' knowledge and attitudes about pain assessment and management at the University of Applied Health Sciences Zagreb, Croatia. Therefore, the aim of this pilot study is to evaluate the knowledge and attitudes of undergraduate nursing students about pain. This study also aims to gather information that could serve as an incentive for further research that may assist in the development of appropriate strategies to improve pain education.

HYPOTHESES

Hypothesis 1: Most nursing students will achieve less than 80% of correct answers on the "Knowledge and Attitudes Survey Regarding Pain" questionnaire.

Hypothesis 2: Students who have had experience working as a nurse or the opportunity to apply pain relief methods during clinical practice will have a statistically significant higher number of correct answers on the questionnaire compared to those students who have not had work experience or did not have the opportunity to apply pain relief methods.

Hypothesis 3: Third-year nursing students will have a higher number of correct answers on the questionnaire compared to second-year nursing students.

METHODS

STUDY DESIGN

A pilot study was conducted at the University of Applied Health Sciences, Zagreb, Croatia, during the beginning of the spring semester, over a three-month period from March till May, in the academic year 2024/2025. An online survey that examines the nursing student's knowledge and attitudes regarding pain was created in Google Forms. The questionnaire was distributed by the authors through student groups using an access QR code (WhatsApp) for the first time in March. WhatsApp was chosen as the distribution platform because all nursing student cohorts have established groups used for communication and information exchange. In April, a reminder to complete the questionnaire was sent to the students. The final data collection took place in May, when the last reminder was forwarded to the students. Written instructions were provided to the participants, and the intention of the study was stated prior to completing the questionnaire. Participation was anonymous and voluntary. The completion time for the questionnaire was approximately 10-15 minutes. There were no consequences for the participants that wanted to withdraw from the study, and it could be done at any time from the beginning.

SAMPLE

The population sample included undergraduate nursing students at the University of Applied Health sciences in Zagreb. The total number of nursing students enrolled in the second year and third year was 175. In total, 56 students participated in this study (32%), 13 second year nursing students (23.21%), and 43 third year nursing students (76.79%).

Inclusion criteria included active and full-time student status at the University of Applied Health studies in Zagreb, and consent for data processing given by submitting the fully answered questionnaire. The exclusion criteria included students that did not have active student status at the specified educational institution, those who submitted an incomplete questionnaire, and those who did not consent to data processing.

INSTRUMENT

The research instrument utilized in this study was developed based on the "Knowledge and Attitudes Survey Regarding Pain: Ferrell and McCaffery, 1987 (KASRP)". The original version was translated from English into Croatian by the first author, who is familiar with the subject matter, and then subsequently reviewed by the second author, a nursing expert, to ensure semantic equivalence. The Croatian translation of the questionnaire was aligned after discussions and agreement from both authors. Then the Croatian version was translated back into English and compared with the original KASRP. The use of the original instrument questionnaire and answer key, in whole or in part by other respondents, is permitted according to the author's instructions with a citation of the source (24). The original KASRP survey consisted of 39 questions in different formats: twenty-two true or false questions, sixteen multiple choice questions, and two case studies with each having two questions about assessment and medication application.

The instrument used in this research consisted of two

parts. Part one was six questions that provided socio demographic information from the participants: age, gender, work experience, study year, experience in the application of methods for pain relief during clinical practice and participation in the elective course in Pain Therapy. The second part consisted of 24 questions taken from the KASRP. These questions include sixteen true or false questions, six multiple choice questions, and two case studies. Each question answered correctly was awarded one point, besides questions 23 and 24, which were awarded two points as they both included two questions in a) and b). Incorrectly answered questions were scored with zero points. The maximum score for the questionnaire was 26 points and the minimum score was zero points. The results were shown as an absolute value and as a percentage of correct answers. The reliability was calculated on the modified scale; the result was an acceptable threshold (Cronbach alpha= 0.603).

The criteria for sufficient knowledge about pain were set at a threshold of 80% of answered questions (=20.8 points). The threshold was rounded to 21 points to reduce the risk of misclassification due to measurement error and to provide a practically applicable whole number cut off. The threshold of 80% correct answers was used to define adequate knowledge, in accordance with previous studies that applied the same criteria (12,15-16,25-26).

Authors decided that only part of the questions from the original questionnaire would be used for the purpose of conducting the research. The reasoning for not using the full questionnaire is the difference in the cultural and clinical environment, as well as the population. The original instrument was adapted to prevent fatigue and respondent burden, as the original questionnaire was considered too complex for the target group of nursing students. The items removed were questions the authors perceived too difficult or not understandable for the students in the context of nursing education in Croatia, because the questions focused on medication selection and use, analgesic combination, duration and potency. Since physicians oversee prescribing medications in Croatia, these questions were removed. One of the questions removed from the Croatian translation concerns Vicodin dosage. Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) is not a registered medication in Croatia. For that reason, the question was removed. Given that the nursing curriculum in Croatia is more focused on independent interventions applied by nurses (pain assessment and non-pharmacological pain relief procedures) than on pharmacological procedures (drugs and drug doses), since these are the responsibility of physicians, a more concise version was necessary to maintain the student's attention. This adaptation has influenced the reliability score for the questionnaire (Cronbach alpha= 0.603), and results should be interpreted with care when comparing with existing studies using the whole KASRP questionnaire. The KASRP is one of the most widely used instruments for assessing knowledge and attitudes regarding pain in nursing. The instrument was originally developed in 1987 and last revised in 2014, before the last revision of the IASP pain definition in 2020. (1). Its limitations, as noted in previous studies, are emphasis on pharmacological aspects of pain management, which authors believe to be difficult and complex, as these aspects are not the primary focus of nursing education. These questions are believed to contribute to generally lower scores among the respondents. Despite these limitations, the KASRP was selected due to its widespread use and the possibility of comparing results with previous studies. Considering the potential limitations of the instrument used in this study, the findings of this study should be interpreted with care.

ETHICAL CONSIDERATIONS

The approval for this pilot study was given by the ethical committee of the university (Admin. No.: 053-01/25-01/28, Ref. no.: 251-379-10-25-02). Participation in this research and completing the questionnaire was entirely voluntary and anonymous. Withdrawal from the study was possible at any time during the questionnaire. Students consent to participate in the study and to the statistical processing of the data was given by submitting the completed questionnaire.

STATISTICAL ANALYSIS

The collected data were entered into a database and analyzed using the statistic program JASP 0.10.3. Socio demographic characteristics of the sample (age, gender, work experience, study year, experience in pain management and elective course participation) were described using descriptive statistics. In addition to that, descriptive statistics were also used for each item in the questionnaire, showing the number of correct answers as well as the percentage. For testing the hypotheses, inferential statistics were used. Discrepancies between groups of students were analyzed using the independent samples t-test, with the significance level of 0.05 having been established. No missing data were encountered in this study. All participants completed the questionnaires in full. Therefore, no missing data processing was performed.

RESULTS

A total of 56 questionnaires out of 175 (response rate 32%) were collected from students of the full-time undergraduate nursing program at the university, with 13 respondents from the second year (23.21%), and 43 respondents from the third year of nursing (76.79%). The low response rate in this study may be attributed to the demanding academic schedules of nursing students, as well as a potential lack of motivation or perceived relevance of the questionnaire on pain knowledge. Most of the respondents were women (92.86%). Nearly all respondents were in the age group of 19-24 years (98.21%). Of

the total sample, only 19 respondents have experience working as nurses (33.93%). Most respondents had the opportunity to apply pain relief methods during clinical practice (91.07%). An elective course in Pain Therapy was attended by half of the students (50%) (Table 1).

Table 1. Sociodemographic characteristics of the research participants.

Sociodemographic characteristics (n=56)		Frequency (n)	Percentage (%)
Gender	Women	52	92.86
	Men	4	7.14
Age	19-24 years	55	98.21
	25-30 years	1	1.79
Study year	Second year	13	23.21
	Third year	43	76.79
Work experience	Yes	19	33.93
	No	37	66.07
Clinical practice experience	Yes	51	91.07
	No	5	8.93
Elective course Pain Therapy	Yes	28	50.0
	No	28	50.0

The mean score for the KASRP was 16.66 (64.08%), while the standard deviation was 3.18 (Table 2). Normality of the questionnaire data was assessed using skewness and kurtosis indices. According to Tabachnick and Fidell, the range within ±2 (27) is considered acceptable, thus satisfying the conditions of normal distribution for the questionnaire.

Table 2. Descriptive data for the questionnaire KASRP.

	Arithmetic mean	Standard deviation	Range of results	Skewness	Kurtosis
KASRP-CROa	16.66	3.18	10-23	-0.24	-0.63

aKASRP-CRO = Knowledge and Attitudes Survey Regarding Pain – Croatian

Slightly more than half of the students knew that the patient's vital signs weren't always reliable indicators of the intensity of their pain (55.35%). Almost all participants knew that elderly patients could tolerate opioids for pain management (96.43%). Although most students knew the definition of opioid/narcotic addiction (91.07%), nearly half wrongfully thought that patients with a previous history of substance misuse should not be given opioids for pain management (42.86%). Regarding the administration of medications, (58.92%) slightly more than half knew that applying opioid analgesics intravenously is recommended for patients with severe pain of sudden onset, whereas just under a third (28.57%) knew that oral opioid analgesics are recommended for patients' cancer-related pain. To examine students' knowledge related to pain assessment and the selection of appropriate interventions for pain relief, we presented two cases in which the patients were of the same age, had undergone the same procedure, and had identical vital signs. The only difference between the patients was their observable behavior and facial cues. The first patient appeared to be in good spirits and was smiling, whereas the second patient was grimacing and lying still. In both cases, students were told to assess the patient's current pain level. Following the assessment, they were asked to select an appropriate intervention for pain management. More than half of the students provided an accurate assessment in both scenarios (62.50% first case, 76.79% second case), rating the pain as 8/10. However, in the first case, none of the students selected an appropriate intervention for pain reduction, while in the second case only eight students (14.28%) chose the correct intervention of administering 3 mg IV morphine (Table 3).

Table 3. Distribution of correct answers among research participants.

Item no.	Question	Correct answers (N)	Percentage (%)
1.	Vital signs are always reliable indicators of the intensity of a patient's pain. (False)	31	55.35
2.	Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences. (False)	38	67.86
3.	Patients who can be distracted from pain usually do not have severe pain. (False)	41	73.21
4.	Patients may sleep in spite of severe pain. (True)	18	32.14
5.	Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. (True)	30	53.57
6.	Opioids should not be used in patients with a history of substance abuse. (False)	32	57.14
7.	Elderly patients cannot tolerate opioids for pain relief. (False)	54	96.43

Item no.	Question	Correct answers (N)	Percentage (%)
8.	Patients should be encouraged to endure as much pain as possible before using an opioid. (False)	50	89.29
9.	Children less than 11 years old cannot reliably report pain, so clinicians should rely solely on the parent's assessment of the child's pain intensity. (False)	53	94.64
10.	Patients' spiritual beliefs may lead them to think pain and suffering are necessary. (True)	52	92.86
11.	After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response. (True)	47	83.93
12.	If the source of the patient's pain is unknown, opioids should not be used during the pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain. (False)	21	37.50
13.	Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regiment. (True)	19	33.93
14.	Narcotic/opioid addiction is defined as a chronic neurobiological disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving. (True)	51	91.07
15.	The term 'equianalgesia' means approximately equal analgesia and is used when referring to the doses of various analgesics that provide approximately the same amount of pain relief. (True)	42	75.00
16.	Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression (True)	52	92.86
17.	The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is (Oral)	16	28.57
18.	The recommended route administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or postoperative pain is (Intravenous)	33	58.92
19.	Analgesics for post-operative pain should initially be given (Around the clock on a fixed schedule)	39	69.64
20	The most likely reason a patient with pain would request increased doses of pain medication is (The patient is experiencing increased pain.)	50	89.29
21.	The most accurate judge of the intensity of the patient's pain is (The patient)	50	89.29
22.	The time to peak effect for morphine given IV is (15 minutes)	28	50.00
23.1 Patient A	Pain assessment on patient with relaxed manner (8)	35	62.50
23.2. Patient A	Morphine administration for reported pain in the absence of vital sign indicators and side-effects for patient with relaxed manner (3 mg IV)	0	0.00
24.1. Patient B	Pain assessment on patient with grimace (8)	43	76.79
24.2. Patient B	Morphine administration for reported pain in the absence of vital sign and behavioral changes for patient who grimaces (3 mg IV)	8	14.29

Hypothesis 1: Most nursing students will achieve less than 80% of correct answers on the KASRP questionnaire.

Most of the participants, 89.3% (N=50) achieved less than 80% correct answers on the KASRP questionnaire, thus confirming the first hypothesis of this research (Table 4).

Table 4. Frequency table of the number of correct answers.

Correct answers	Frequency	Percentage	Cumulative percentage
10	2	3.6	3.6
11	1	1.8	5.4
12	4	7.1	12.5
13	5	8.9	21.4
14	1	1.8	23.2
15	7	12.5	35.7
16	5	8.9	44.6
17	6	10.7	55.4
18	6	10.7	66.1
19	10	17.9	83.9
20	3	5.4	89.3
21	3	5.4	94.6
22	2	3.6	98.2
23	1	1.8	100
Total	**56**	**100.0**	

To examine the difference in the number of correct answers on the KASRP questionnaire in relation to experience and year of study, t-tests for independent samples were used.

Hypothesis 2: Students who have had experience working as a nurse or had the opportunity to apply pain relief methods during clinical practice will have a statistically significant higher number of correct answers on the questionnaire compared to those students who have not had work experience or did not have the opportunity to apply pain relief methods.

Statistically no significant difference was found in the number of correct answers on the questionnaire between students with work experience or opportunity applying pain relief methods (M= 17.47, SD=2.50) and those students without work experience or without the opportunity to apply pain relief methods (M=16.24, SD=3.43) (t=-1.382, df=54, p>0.05) (Table 5). Therefore, the second hypothesis was rejected.

Table 5. Examination of the difference in the number of correct answers based on experience.

Variable	Work/ clinical experience	Without work/ clinical experience	t	df	p
Correct answers M(SD)	17.47 (2.50)	16.24 (3.43)	-1.382	54	>0.05

M=mean; SD: standard deviation; t=independent samples t-test; df= degrees of freedom

Hypothesis 3: Third-year nursing students will have a higher number of correct answers on the questionnaire compared to second-year nursing students.

There was no statistically significant difference found between the number of correct answers on the questionnaire between second-year students (M=16.85, SD=2.94) and third-year students (M=16.60, SD=3.28)(t=0.24, df=54, p>0.05). Considering this, the third hypothesis of this research was not confirmed (Table 6).

Table 6. Examination of the difference in the number of correct answers by study year.

Variable	Second year	Third year	t	df	p
Correct answers M(SD)	16.85 (2.94)	16.60 (3.28)	0.24	54	>0.05

M=mean; SD: standard deviation; t=independent samples t-test; df= degrees of freedom

DISCUSSION

This study assessed second and third-year nursing student's knowledge and attitudes about pain. Overall, the response rate was 32% (N=56), which may indicate that the target population had a lack of motivation or perceived relevance of the questionnaire on pain knowledge. This study showed that undergraduate students had inadequate knowledge regarding pain based on the minimum score set by the authors (80%). The respondents' overall KASRP mean score (64.08%) was higher than students from Spain (55.8%), Saudi Arabia (42.6%), Jordan (40%), Australia (62.53%) and Jordan (34.1%), and lower than students from Texas (68%) and Canada (66.7%) (12,19,21,25-26,28-29). Results found that nursing students have shown weakness in pharmacological management of patients with pain and that they lack knowledge in pain assessment and reporting, which is consistent with studies by Al Khalaileh et al., Zuazua-Rico et al., Duke et al. and Hroch et al. (12,25-26,28). These findings were expected since pharmacological therapy

is not the primary focus of nursing education. Furthermore, studies found that students' weak areas are related to medication administration (26,30). Findings indicate that nursing students share similar concerns and misconceptions about opioid use and addiction as reported among nurses in previous studies. This highlights the ongoing need for education and training to address these misunderstandings and to promote safe and effective pain management practices (28,30-31). In contrast to nursing students, nursing faculty were the only group to demonstrate adequate knowledge, scoring an average of 71% in the study by Duke et al. and 77.88% in the study by Voshall et al. (25,32), suggesting that expertise is largely concentrated among those responsible for teaching and training. Although students were generally able to assess the patient's pain relatively accurately, they mostly failed to apply the appropriate interventions in both practical cases, which are in line with other studies (12,19,25,29).

The students who have had experience working as nurses or had the opportunity to apply pain relief methods during clinical practice were put together as one group with students who have not had work experience or did not have the opportunity to apply pain relief methods. Since clinical practice is mandatory for all students to pass their courses, all students should be given the opportunity to assess pain and apply pain relief methods. There was no statistical difference between the results from the two groups. A possible explanation can be that clinical or work experience by itself does not mean that a person has more theoretical knowledge or better attitudes. Given that all students have the same educational background, their levels of theoretical knowledge should be similar.

When comparing the results of nursing students in their second and third year of study, there was no statistically significant difference. The reasoning behind that could be that the courses focusing on teaching students about pain are taught in the first year. For example, pharmacology, physiology, fundamentals of nursing, process of nursing care, with only a few subjects focusing on pain in the second year, like pain therapy. Thus, students from the second and third year have received the same education regarding pain, explaining why there was no difference between their answers. This finding suggests that adding more subjects that focus on pain in the third year could improve knowledge and provide repetition and continuing education.

Findings highlight the significance of evaluating how pain assessment and management are taught throughout the nursing curriculum. Pain management education should be reinforced and incorporated across both theoretical and clinical settings within nursing curricula. Education could be improved by offering more simulation-based education exercises in clinical labs, thus preparing students for real scenarios in clinical environments. In addition to that, incorporating clinical rotations focused on pain assessment and management could enhance students' ability to provide patient-centered care.

LIMITATIONS

The limitations of this research include a small sample size and the use of a modified version of the questionnaire, which restricts the possibility of comparison with other studies using the KASRP. For future research, it is recommended to use the complete KARSP to obtain a comprehensive assessment of nursing students' understanding and perceptions of pain. A major limitation is the small number of participants from the second year (N=13, 15%). Additional research on a larger sample is needed to determine if students have insufficient knowledge about pain and to identify the factors that influence it and develop strategies to improve the teaching content.

CONCLUSION

Nurses have an important role in managing patients' pain. They assess the intensity of the pain daily and apply different interventions and methods for pain relief. During the undergraduate studies, nurses need to acquire the fundamental knowledge required for proper pain assessment and pain management, as well as critical thinking skills and decision-making abilities. The results of the research indicate that students have inadequate knowledge about pain management and that there is a need for continuous education and assessment of nurses' knowledge about pain management methods and accurate pain assessment. The results are important and should serve as an incentive for further research on a larger sample of respondents, with the aim of obtaining evidence necessary for the improvement of basic and continuing education of nurses, thereby increasing the quality of pain management.

DATA AVAILABILITY STATEMENT

The data in this study are available from the corresponding authors upon request. The data are not available to the public for confidentiality reasons.

ETHICS STATEMENT

The ethics approval for this study was given by the ethical committee of the University of Applied Health Sciences, Zagreb, Croatia (Admin. No.: 053-01/25-01/28, Ref. No.: 251-379-10-25-02). The study was made in accordance with the principals of the Declaration of Helsinki.

AUTHORS CONTRIBUTION

Authors declared that all contributed equally. All authors approved the submitted version.

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Nothing to declare.

CONFLICT OF INTEREST

There are no conflicts of interest to declare.

GENERATIVE AI STATEMENT

Nothing to declare.

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