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Surgical nurses' perceptions of administering opioid drugs: A descriptive and cross-sectional study

Abstract

Objective: This descriptive and cross-sectional study investigated how surgical nurses perceived opioid administration.

Material and methods: The sample consisted of 108 nurses from the surgical units of a state hospital in the north of Turkey. Data were collected using a nurse introduction form and the nurses' perception of administering opioids questionnaire. The data were analysed using descriptive statistical methods and Spearman's correlation test.

Results: More than half of the participants (51.9%) reported frequently administering opioid drugs. Some of the participants (15.7%) stated that they observed their patients having side effects following opioid drug administration. The three most common side effects were hypotension (46.6%), nausea (30.0%) and vomiting (11.6%). Most participants (87.9%) noted that they should know more about opioid drugs than other drug groups in order to administer them safely. There was a weak negative correlation between participants' knowledge of side effects when administering opioid drugs and their age, work experience in general, and work experience in the unit ($p < 0.05$).

Conclusion: It has been determined that surgical nurses need training in the administering of opioid group drugs. Hospitals should provide surgical nurses with in-service training in opioid administration.

Keywords: analgesics, pain, nurse, opioid administration, perception

Introduction

Everybody experiences pain at some point in their lives[1]. According to the International Association for the Study of Pain (IASP), pain is defined as 'an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage'[2,3]. Studies into the prevalence of pain in the general population have reported a range of results. A global study reported that the prevalence of pain was 27.5 per cent across 52 countries[1]. In the United States of America, one in five adults experience pain[4]. In Europe, the point prevalence of chronic pain has been determined to range between 12 and 48 per cent, the six-month prevalence has been determined to range between 17.5 and 49.8 per cent, and the lifetime prevalence of pain between 12.7 and 33.7 per cent[5]. In Turkey the prevalence of pain was 80.84 per cent[6]. Studies have also been conducted into acute pain following surgery. It has been reported that the prevalence of adult surgical patients experiencing acute pain ranges from 48 to 78 per cent[7]. Surgical patients may continue to experience pain after discharge[8]. The pooled prevalence of moderate-to-severe pain in these patients within two weeks after discharge has been reported to vary between 31 and 58 per cent[8].

Pain impacts daily functioning, overall health and economic status. It also exerts negative physical and psychological effects[4,9]. Individuals who experience pain often seek healthcare services[6]. Various pharmacological, non-pharmacological and interventional methods are used in pain management[10]. The World Health Organization recommends primarily using non-opioid analgesics for pain management, with weak opioids and strong opioids being considered respectively as pain severity increases[11].

Opioids are preferred for severe, acute pain management. They reduce the sensation of pain by binding to opioid

receptors in the brain, spinal cord and other parts of the body[12]. The most popular forms of opioids are potent agonist drugs (oxycodone, tapentadol, buprenorphine, morphine, fentanyl) and weak agonist drugs (tramadol)[13]. However, they have various side effects – the most common are nausea, vomiting, hypotension, ileus, respiratory depression and delirium[10] – and may result in addiction, tolerance and hyperalgesia when used continuously and inappropriately[12,14,15]. Healthcare professionals can prevent those side effects to a significant extent by employing both pharmacological and nonpharmacological measures[16–18].

Acute post-operative pain is defined as pain that arises following tissue injury associated with surgery and that diminishes during the recovery process[10]. Analgesia provided by a single agent may not be effective enough to manage post-operative pain. Therefore, post-operative pain necessitates the combined use of one or more analgesic agents and analgesia methods with varying mechanisms of action, known as multimodal analgesia[19].

Doctors or nurse practitioners sometimes prescribe opioids to patients in the post-operative period. For the treatment of post-operative pain, opioids should primarily be administered orally, with intravenous (IV) administration reserved for patients unable to use the oral route. Healthcare professionals should avoid the intramuscular route because absorption is unreliable and the process is painful[10]. Surgical nurses are responsible for administering opioids safely (the right drug, the right dose and the right route of administration) and monitoring and assessing their side effects[10,20]. Opioid-induced ventilatory impairment (OIVI) is a condition characterised by the suppression of respiratory drive due to the effects of opioids on the central nervous system. OIVI disrupts normal respiratory rhythms, leading to hypoventilation, hypercapnia, hypoxia and respiratory arrest. This condition depends on the opioid dose, the drug's pharmacokinetics, and patient-specific risk factors, such as obstructive sleep apnoea or concurrent use of sedatives[21,22].

Surgical and intensive care nurses administer opioids very often[20,23]. However, research shows that nurses know little about effective pain management and analgesia[24–31]. Healthcare professionals should ensure that patients experience a minimum of harm and a maximum of benefit from the use of opioids[32]. Before administering opioids, nurses should possess adequate knowledge and accurate perceptions of drug administration to ensure effective pain management[33–35]. Understanding how nurses perceive opioid administration can facilitate educators in revising curricula to ensure that nursing students receive comprehensive education on opioid administration and cultivate positive attitudes toward it[36–38]. This study investigated how surgical nurses perceived opioid administration. The results are expected to contribute to the organisation of in-service trainings on the subject in hospitals by raising awareness and making comparisons between countries.

Aim

This study aimed to determine the general perceptions of surgical nurses concerning opioid administration.

Research question: How do surgical nurses perceive opioid administration?

Materials and methods

Design

The research was conducted with a descriptive and cross-sectional design. This study is presented following the STrengthening the Reporting of OBservational Studies in Epidemiology (STROBE) checklist[39].

Study population and sample

The study was conducted in the surgical units of a public hospital in northern Turkey between 1 May and 1 June, 2023. The study population consisted of 186 nurses from the surgical clinics (n = 98) and surgical intensive care units (ICUs) (n = 88). No sampling was performed as the goal was to recruit as many nurses as possible. The sample consisted of 108 surgical nurses who met the inclusion criteria (participation rate 58.6%) (see Figure 1). The research was conducted in seven surgical clinics (two general surgery clinics, one cardiovascular surgery clinic, one orthopaedics clinic, one neurosurgery clinic, one urology and thoracic surgery clinic, one ear nose throat clinic and one eye diseases clinic) and five ICUs (three reanimation ICUs, one surgical ICU and one cardiovascular surgery ICU).

Inclusion and exclusion criteria

Nurses who were surgical clinic nurses or surgical ICU nurses, with at least three months of work experience and who volunteered to participate in the study were included.

Nurses who had worked in the surgical units for less than three months, were having a medical report during the research, were on annual leave during the study period or did not volunteer to participate in the study were not included.

Data collection tools

The data were collected using a nurse information form and a questionnaire about perceptions of administering opioid medications.

Nurse information form

The nurse information form was developed by the researchers[40,41]. It consisted of eight items – three sociodemographic characteristics (age, gender and education level), three professional characteristics (unit of employment, number of years working as a nurse, number of years working in the surgical unit where they were employed at the time of the study), one about frequency of administration of opioids and one about encountering side effects.

Nurses' perception of administering opioids questionnaire

The nurses' perceptions of administering opioids (NPAO) questionnaire[42] was developed by Guest, Sobotka, Karavasopoulou, Ward and Bantel in 2017 and adapted into Turkish in 2022 by Yılmaz and Akansel[33]. The questionnaire consists of 14 items rated on a five-point Likert-type scale (1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree, 5 = strongly disagree). It has no subscales or cut-off points. The original questionnaire and its Turkish version have a Cronbach's alpha score of 0.80, which was 0.70 in the present study.

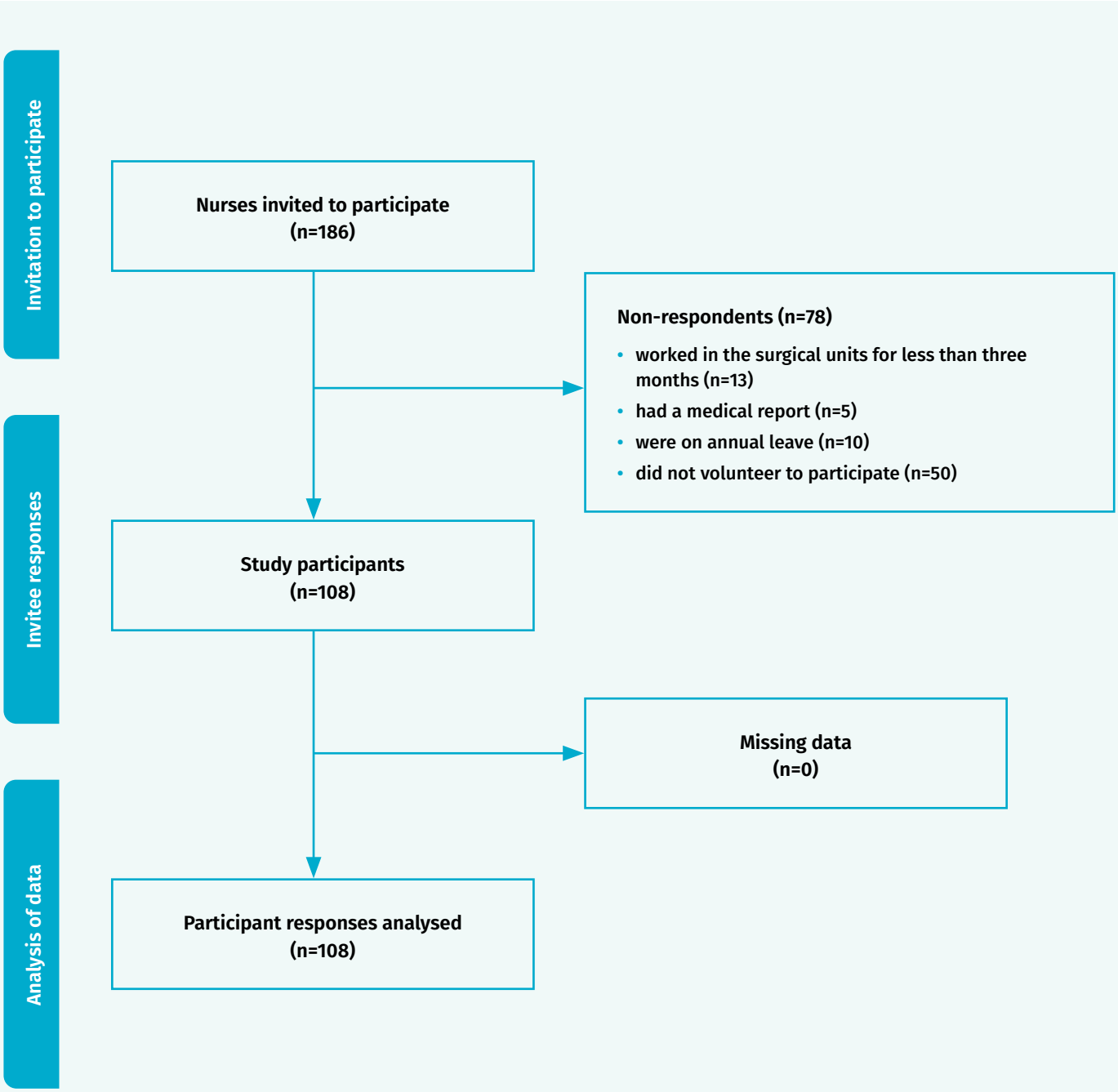

Figure 1: Flow diagram of study participants

Data collection procedures

The data were collected by the researchers between May 1 and June 1, 2023. Two of the authors (ÖSA, EAK) were working as nurses in the hospital where the study was conducted. They visited the surgical units and informed the nurses about the scope of the study. The nurses who volunteered to participate in the study were given the data collection tools in a sealed envelope. The nurses were asked to fill out the tools and seal them in the provided envelopes for collection by the researchers at the designated time. The forms were received in sealed envelopes after being answered individually by the nurses. The envelopes were opened by researchers who were not involved in the data collection process, and data transferred to the computer anonymously. It took each participant 10 to 15 minutes to fill out the data collection tools.

Ethical considerations

The study was approved by the university's Non-Invasive Clinical Research Ethics Committee (on 17.02.2023, No. 64). Permission was obtained from the Provincial Directorate of Health (on 06.04.2023, No. E-39055495-000-211245655). Written informed consent was obtained from all participants. Each stage of the research was carried out according to the ethical principles outlined in the Declaration of Helsinki.

Table 1: Descriptive characteristics of participants (N=108)

Variables		n (%)
Age in years Mean ± standard deviation (minimum–maximum)		37.26±8.83 (22–54)
Years working in the profession Mean ± standard deviation (minimum–maximum)		14.94±9.84 (1–36)
Years working in the current ward Mean ± standard deviation (minimum–maximum)		6.43±6.01 (1–29)
Gender	female	96 (88.9)
	male	12 (11.1)
Education level	undergraduate and postgraduate	97 (89.8)
	high school and associate degree	11 (10.2)
Unit of employment	reanimation intensive care	40 (37.0)
	general surgery clinic	18 (16.7)
	cardiovascular surgery clinic	18 (16.7)
	general surgery intensive care	10 (9.3)
	orthopaedics clinic	7 (6.5)
	neurosurgery clinic	6 (5.6)
	urology and thoracic surgery clinic	5 (4.5)
	ear, nose, throat clinic and eye diseases clinic	4 (3.7)
Frequency of opioid drug administration	often	56 (51.9)
	rarely	48 (44.4)
	never	4 (3.7)
Observed side effects of opioid drugs	yes	33 (15.7)
	no	75 (84.3)
Adverse side effects observed (n=60)*	hypotension	28 (46.6)
	nausea	18 (30.0)
	vomiting	7 (11.6)
	respiratory arrest	3 (5.0)
	allergic reaction	1 (1.7)
	hallucination	1 (1.7)
	hypoxia	1 (1.7)
	bradycardia	1 (1.7)

*More than one answer could be given to the question. Percentages are taken from the answers.

Data analysis

The data were analysed using the Statistical Package for Social Sciences (SPSS 18.0) at a significance level of 0.05. Numbers, means, standard deviations, percentages and minimum and maximum values were used for descriptive data. The independent variables were sociodemographic characteristics, while the dependent variables were scale scores. Normality was tested using the Kolmogorov-Smirnov test, normal distribution curve, histogram graph, skewness and kurtosis coefficient of variation. The data were non-normally distributed because the skewness and kurtosis coefficient values did not range from +1.5 to -1.5[43]. The Fisher exact test was used to compare percentage values. Spearman's correlation test was used to determine the differences between groups (0.00 < r < 0.25 = very weak, 0.26 < r < 0.49 = weak, 0.50 < r < 0.69 = moderate, 0.70 < r < 0.89 = high, 0.90 < r < 1.00 = very high)[44].

Results

Table 1 shows the sociodemographic characteristics of participants. Participants had a mean age of 37.26 years (±8.83). They had worked 14.94 years (±9.84) as a nurse, and 6.43 years (±6.01) in the surgical unit. Most participants were female (88.9%) with at least a bachelor degree (89.9%). Less than half of the participants (37%) worked for the reanimation ICU. More than half of the participants (51.9%) administered opioids very often. The majority of the participants (84.3%) reported observing no side effects after administering opioids. The most common side effects were hypotension (46.6%), nausea (30.0%) and vomiting (11.6%).

Table 2 shows the distribution of NPAO responses. More than half of the participants agreed or strongly agreed with items 1, 2, 3, 5, 9, 10, 12, 13 and 14. More than half of the participants disagreed or strongly disagreed with items 4 and 8. Almost half of the participants considered opioids (e.g. morphine) dangerous because they are controlled drugs and require double signing (item 7). More than a quarter of the participants associated opioids (e.g. morphine) with drug abuse or were undecided about it (item 11).

Table 3 shows the correlations between the questionnaire items and three of the participant characteristics – age, number of years they had been working as a nurse and number of years they had been working in the current ward. The number of years participants had been working in the current ward was negatively correlated (rho = -0.278, p = 0.004) with their responses to item 7 (Opioid drugs are dangerous because they require control and double signatures). There was a negative correlation between all three characteristics and participant responses to item 10 (I know the side effects when administering opioid medications – age (rho = -0.286, p = 0.003), number of years working in the profession (rho = -0.255, p = 0.008), number of years working in the current ward (rho = -0.200; p = 0.038). The number of years participants had been working in the current ward was negatively correlated (r = -0.198; p = 0.040) with their responses to item 13 (I am more concerned when administering opioid medications to patients with a history of substance abuse).

Discussion

Every year, numerous patients receive opioids to manage post-operative pain[45]. Surgical and ICU nurses are responsible for administering opioids ordered by physicians. Nurses regularly assess patients for pain and respond to their calls for additional analgesics[46].

In our study of 108 surgical nurses, participant characteristics were collected via a nurse information form and participants completed the NPAO questionnaire. Questionnaire items were correlated with participant characteristics and the correlations were tested for statistical significance. Participant age, gender, number of years working in the profession and number of years working in the surgical unit were found to correlate with certain questionnaire items.

Our results showed that older participants knew less about the side effects of opioids (item 10) than their younger counterparts. It was also found that female participants knew more about the side effects of opioids than their male counterparts. Yılmaz and Akansel[33] also found that female nurses knew more about opioids than their male counterparts. This is probably due to various factors such as education level, work experience, frequency of opioid administration and participation in in-service training programs.

Nurses with fewer years of service on the surgical unit were more likely to perceive administering opioid medications as dangerous (item 7) compared to nurses with more years of service. This is possibly because nurses with less experience working in clinical units are more concerned about administering opioids than those with more experience. Opioid safety emerged as a theme in a qualitative study of nurses conducted by Şen et al. In that study, the researchers found that more than a third of participants (12/30) believed that opioids were unsafe drugs that caused stress, and all the participants thought opioids were addictive[47]. Similarly, Cooley et al.[48] found that nurses were concerned about administering opioids.

The results of our study also showed that participants with more work experience knew less about the side effects of opioids (item 10) than those with less work experience. Khetarpal et al.[49] focused on nurses with little work experience and reported that more than half of the nurses (55.5%) believed that patients could not tolerate opioids, and that most nurses (88.2%) had the misconception that patients who needed more analgesics were addicted to narcotics. Baldemir et al.[40] also investigated nurses' beliefs about opioids and reported several important findings. First, nurses had gaps in their knowledge of opioids. Second, most nurses needed more training because they were concerned about administering opioids. Third, most nurses believed that doctors should prescribe low doses of opioids due to their side effects. These results suggest that nurses are significantly concerned about the side effects of opioids. Therefore, nurses should administer opioids in a balanced manner to maximise the analgesic benefits for patients while minimising the occurrence of side effects[32].

A number of studies have investigated nurses' perceptions about administering opioids to patients with a history of substance abuse. Tosunöz et al.[34] reported that many surgical nurses (70%) were concerned about administering opioids to patients with a history of drug abuse. Cüceler et al.[50] recommended that nurses care for substance abusers without prejudice. Cooper[51] documented that nurses believed that opioids would not work for people with a history of substance abuse and that most nurses were hesitant about administering opioids to patients addicted to opioids because they were concerned that it would cause their death. Heckroth et al.[46] presented participants with two scenarios – in one the patient was intoxicated and in the other the patient was sober – and compared nurses' concerns about opioid administration. The researchers found that most nurses were hesitant about administering opioids to patients who were under the influence of alcohol[46].

Our results showed that participants with less experience working in the surgical unit were more concerned about administering opioids to patients with a history of drug abuse than those with more experience. Nurses should treat patients with a history of opioid abuse with an eye to beneficence, do-no-harm, advocacy, patient autonomy, nursing autonomy and integrity. Nurses are ethically responsible for providing superior care to manage pain appropriately[52].

Limitations

The study was conducted with nurses working in surgical clinics and surgical intensive care units in a single health centre. Since nurses' perceptions may change over time, the results of the research are limited to the time period in which the research was conducted. The results are sample-specific and, therefore, cannot be generalised to all nurses.

Conclusion and recommendations

Efficient management of opioids in surgical units contributes positively to both the patient and the institution. The more positive perceptions surgical nurses have about the administration of opioids, the safer they will administer them. Our results show that surgical nurses observe some side effects in their patients after administering them opioids, suggesting that they need more training on the issue. Clinics should hang posters, infographics and algorithms, and establish written protocols to inform surgical nurses about the administration of opioids. Hospitals should provide surgical nurses with in-service training in safe opioid use.

Table 2: Participant responses to nurses' perceptions of administering opioids questionnaire items (N=108)

Item	Strongly agree n (%)	Agree n (%)	Undecided n (%)	Disagree n (%)	Strongly disagree n (%)
1. The large number of new opioid drug types makes it difficult to administer drugs in this group.	11 (10.2)	33 (30.6)	33 (30.6)	27 (25.0)	4 (3.7)
2. I need more information to safely administer opioid medications (e.g. morphine) than other drug groups (blood pressure medications or insulin etc.).	28 (25.9)	67 (62.0)	6 (5.6)	6 (5.6)	1 (0.9)
3. I need to observe patients more closely when administering opioid medications (e.g. morphine) than with other drug groups (blood pressure medications or insulin, etc.).	45 (41.7)	54 (50.0)	3 (2.8)	3 (2.8)	3 (2.8)
4. Because I am afraid of administering opioid drugs (e.g. morphine), I am not willing to administer this group of drugs.	1 (0.9)	19 (17.6)	23 (21.3)	44 (40.7)	21 (19.4)
5. I am afraid of overdosing when administering opioid medications (e.g. morphine).	9 (8.3)	45 (41.7)	14 (13.0)	20 (18.5)	20 (18.5)
6. Errors in medication prescriptions are a common barrier to nurses administering opioid medications (e.g. morphine).	21 (19.4)	33 (30.6)	37 (34.3)	14 (13.0)	3 (2.8)
7. Opioid drugs (e.g. morphine) are dangerous because they require control and double signatures.	21 (19.4)	28 (25.9)	29 (26.9)	27 (25.0)	3 (2.8)
8. Nurses often associate administering opioid medications (e.g. morphine) with helping patients die.	1 (0.9)	3 (2.8)	10 (9.3)	48 (44.4)	46 (42.6)
9. Knowing about opioid medications (e.g. morphine) gives me more confidence during practice.	47 (43.5)	53 (49.1)	2 (1.9)	4 (3.7)	2 (1.9)
10. I know the side effects when administering opioid medications (e.g. morphine).	29 (26.9)	61 (56.5)	14 (13.0)	4 (3.7)	–
11. Nurses associate opioid medications (e.g. morphine) with substance abuse.	5 (4.6)	30 (27.8)	30 (27.8)	23 (21.3)	20 (18.5)
12. I do not want to make mistakes when administering opioid medications (e.g. morphine) for fear of criminal investigations.	34 (31.5)	43 (39.8)	14 (13.0)	12 (11.1)	5 (4.6)
13. I am more concerned when administering opioid medications (e.g. morphine) to patients with a history of substance abuse.	28 (25.9)	40 (37.0)	20 (18.5)	18 (16.7)	2 (1.9)
14. In order to be comfortable when administering opioid medications (e.g. morphine), I need to trust the doctor who ordered the medication.	28 (25.9)	53 (49.1)	11 (10.2)	13 (12.0)	3 (2.8)

Table 3. Correlation of participant questionnaire responses and some independent variables (N=108)

Items	Age in years	Years working in the profession	Years working in the current ward
Item 1	rho=-0.093 p=0.339	rho=0.089 p=0.359	rho=-0.177 p=0.067
item 2	rho=-0.084 p=0.388	rho=0.098 p=0.311	rho=-0.138 p=0.154
Item 3	rho=-0.060 p=0.537	rho=-0.092 p=0.343	rho=-0.115 p=0.235
Item 4	rho=0.079 p=0.419	rho=0.085 p=0.382	rho=0.33 p=0.736
Item 5	rho=0.182 p=0.059	rho=0.142 p=0.142	rho=0.124 p=0.203
Item 6	rho=-0.97 p=0.320	rho=-0.32 p=0.743	rho=0.038 p=0.694
Item 7	rho=-0.180 p=0.062	rho=0.176 p=0.069	rho=-0.278 **p=0.004***
Item 8	rho=-0.010 p=0.920	rho=0.054 p=0.581	rho=-0.118 p=0.224
Item 9	rho=0.046 p=0.636	rho=0.020 p=0.835	rho=0.045 p=0.645
Item 10	rho=-0.286 p=0.003*	rho=-0.255 p=0.008*	rho=-0.200 **p=0.038****
Item 11	rho=0.073 p=0.455	rho=0.039 p=0.686	rho=0.057 p=0.555
Item 12	rho=-0.182 p=0.060	rho=-0.168 p=0.082	rho=-0.113 p=0.243
Item 13	rho=-0.093 p=0.336	rho=-0.081 p=0.404	rho=-0.198 p=0.040**
Item 14	rho=-0.061 p=0.528	rho=-0.032 p=0.739	rho=-0.032 p=0.739

rho = Spearman's correlation analysis test
*p<0.01
**p<0.05

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