

RESEARCH ARTICLE

Does Clinical Experience Help Oncology Nursing Staff to Deal with Patient Pain Better than Nurses from other Disciplines? Knowledge and Attitudes Survey Amongst Nurses in a Tertiary Care in Malaysia

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Abstract

Background: Successful implementation of pain management procedures and guidelines in an institution depends very much on the acceptance of many levels of healthcare providers. **Aim:** The main purpose of this study was to determine the level of knowledge and attitudes regarding pain among nurses working in tertiary care in a local setting and the factors that may be associated with this. **Materials and Methods:** This cross-sectional research study used a modified version of the Nurses' Knowledge and Attitudes Survey (NKAS) regarding pain. Basic demographic data were obtained for further correlation with the level of pain knowledge. **Results:** A total of 566 nurses, 34 male and 532 female, volunteered to participate in this study. The response rate (RR) was 76%, with an overall mean percentage score of 42.7 ± 10.9 (range: 5–92.5). The majority of participants were younger nurses below 40 years of age and more than 70% had worked for less than 10 years (6.6 ± 4.45). Up to 92% had never had any formal education in pain management in general. The total mean score of correct answers was 58.6 ± 9.58 , with oncology nursing staff scoring a higher percentage when compared with nurses from other general and critical care wards (63.52 ± 9.27 , $p < 0.045$). Only 2.5% out of all participants obtained a score of 80% or greater. The majority of the oncology nurses achieved the expected competency level ($p < 0.03$). **Conclusions:** The present findings give further support for the universal concern about poor knowledge and attitudes among nurses' related to the optimal management of pain. The results reflected that neither number of years working nor age influenced the level of knowledge or attitudes of the practising nurses. Oncology nursing staff consistently scored better than the rest of the cohort. This reflects that clinical experience helped to improve attitudes and knowledge concerning better pain management.

Keywords: Knowledge - attitude - nurses - oncology nursing - pain - competency

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Introduction

Pain amongst hospitalised patients is an under-treated and under-reported problem worldwide (Fairchild, 2010; Nakamura et al., 2011; Robbins et al., 2012). All levels of healthcare providers need to be involved in order to manage pain successfully, especially nurses. Nurses play a vital role in pain management through assessing pain intensity, monitoring for adverse effects of analgesics and assessing patients' satisfaction with pain relief (Musclow et al., 2002; Kaasalainen et al., 2010). Nurses also educate patients to improve their understanding regarding their pain and empowering them to manage or cope with the pain (Musclow et al., 2002). Patients express greater satisfaction when nurses are involved in pain management (Tervo-Heikkinen et al., 2008; Beck et al., 2010). Nurses'

role in pain management is relevant in various settings, including acute care, postoperative care and cancer care (Musclow et al., 2002; Kaasalainen et al., 2010).

Previous studies have found that knowledge and attitudes towards pain management amongst nurses influences the effectiveness of pain management (Tse and Chan, 2004; Subhashini et al., 2009). Insufficient resources and an unsupportive workplace environment make successful pain management even more difficult to achieve (Matthews and Malcolm, 2007; Rejeh et al., 2009; Wang and Tsai, 2010). Despite adequate awareness of the importance of cancer pain and good pain assessment, however, nurses' knowledge regarding opioid pharmacology has still been found to be unsatisfactory (Kaki et al., 2009). Many nurses tend to be affected by the patients' behaviour rather than the actual self-reported

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pain score in assessing pain (McCaffery et al., 2000). As a consequence, they are less likely to optimise opioid doses based on patients' self-reported pain score. In one study, administration of morphine for pain relief was found to be affected by the nurses' perception of socially acceptable behaviour or response to pain (Hazelett et al., 2002).

Misconceptions concerning opioids, such as fear of addiction, low tolerance and side effects, have been observed to be prevalent among all levels of healthcare professionals (Wells et al., 2001 ; Broekmansab et al., 2004; Brant, 2010). Surprisingly, Wells (2001) found that improving knowledge regarding opioids via training in pain management was not effective in improving attitudes towards use of opioids. Many nurses were still uncomfortable administering opioids for pain relief, including for breakthrough pain (Edwards et al., 2001). On the other hand, Edwards (2001) found that a supportive environment promoted better attitudes towards administering breakthrough opioids.

A significant proportion of healthcare professionals, including nurses, are worried about the risks of addiction to opioids. However, the risks of addiction in cancer patients are low, ranging from 0 to 7.7% (Hojsted and Sjogren, 2007; Minozzi et al., 2013). A systematic review has also shown that use of opioids in chronic non-cancer pain rarely causes addiction (Noble et al., 2010). The World Health Organization (1996) has also supported the notion that psychological dependence does not occur in patients taking opioids for cancer pain. It is important to understand that the presence of physical dependence does not mean that the patients are addicted to the use of opioids.

Respiratory depression is another effect of opioids which is of great concern to healthcare professionals. However, pain itself is an antagonist to respiratory depression due to opioids (DuBose RA and Berde CB, 1997). Therefore, the incidence of respiratory depression in cancer patients is extremely low (World Health Organization, 1996; DuBose RA and Berde CB, 1997). It is also rare in chronic non-cancer pain where the patient does not have any co-morbidity affecting the respiratory drive (DuBose RA and Berde CB, 1997). Respiratory depression is usually preceded by sedation, which can be a useful sign to be monitored by healthcare professionals. The risk of respiratory depression is minimised by titration of opioid doses and proper clinical observation (DuBose RA and Berde CB, 1997).

Tolerance is defined as the need for a higher dose of an analgesic with long-term use in order to achieve a similar analgesic effect. Tolerance towards side effects such as nausea, vomiting and sedation occur relatively early when patients are started on opioids (South and Smith, 2001). However, when the disease is not progressing, most patients do not demonstrate an increase in opioid requirements. An increase in opioid requirements to control pain is usually attributed to the disease progression rather than the phenomenon of analgesic tolerance (South and Smith, 2001). Therefore, the concerns regarding patients developing tolerance and requiring higher doses of opioids is frequently not justified. Furthermore, if patients require an unacceptably high dose of opioids

leading to side effects or toxicity, opioid rotation can be carried out (Fine et al., 2009) .

In general, most studies have shown that the knowledge of healthcare professionals is lacking about the above issues, including that of nurses (Furstenberg et al., 1998a; 1998b; Wells et al., 2001; Matthews and Malcolm, 2007). This could lead to development of negative attitudes and working norms in terms of opioid use in pain management.

To the best of our knowledge, there are no randomised control studies regarding Malaysian nurses' knowledge and attitudes towards pain management. This paper reports the findings of a survey conducted in a tertiary teaching hospital concerning Malaysian nurses' knowledge and attitudes towards pain management and their associated factors.

Materials and Methods

Study purposes and study design

This descriptive cross-sectional study was conducted in an 800-bed tertiary public hospital in Kuala Lumpur, Malaysia. The study aimed to determine the level of knowledge and attitudes regarding pain among nurses working in this institution and the factors that may be associated with this.

Study population and sample

The purposive quota sampling method was used to select the respondents for this study. Participants were selected randomly from various wards and departments within the hospital. All nurses were eligible for the survey, except those involved in the pre-testing of the questionnaire.

Instrument

Respondents were asked to provide some baseline demographic data and to complete a bilingual version of the Nurses' Knowledge and Attitudes Survey (NKAS) Regarding Pain, which was developed in 1987 by Ferrell and McCaffery (Fine et al., 2009; Ferrell and McCaffery, 2008). This questionnaire has been used in various studies to measure nursing knowledge and attitudes. All 38 original items of the NKAS tool were used in this study; this consisted of 3 parts, including 20 true-false questions, 14 multiple choice questions and 2 case scenarios. An English and Malay version of the NKAS was produced via back-to-back translation and pre-tested among four randomly selected nurses in order to ensure its comprehensibility and contextual equivalence. Amendments to the bilingual NKAS were made to improve clarity and suitability for the local setting. Respondents involved in the pre-test were not included in the main data analysis.

Ethical considerations

A permission to translate and adapt the NKAS was obtained from the original authors prior to the survey (Ferrell and McCaffery, 2008). This study was approved by the Research and Ethics Committee of the Universiti Kebangsaan Malaysia Medical Center (UKMMC) and was funded by the UKMMC Fundamental Research Grant.

Data collection

The data collection period was from January until August 2013. Questionnaire sets comprising consent forms, self-administered demographic data collection forms, the bilingual NKAS and envelopes were equally distributed to all wards in UKMMC via the ward head nurse. Respondents who agreed to participate in the study signed the consent form and completed the data sheet and NKAS questionnaire. The completed forms were returned in the provided envelope to the head nurse of the respective units.

Demographic data collected included the nurses' age group, gender, current ward specialty, work experience in years, education level including basic and post-basic qualifications and whether they had received any previous formal or informal training in pain management.

Statistical analysis

All data were entered and analysed using the IBM Statistical Package for Social Sciences Processor (SPSS, version 21.0, Copyright IBM Corporation 1989, 2012). The data were independently checked by two researchers to minimise unintended errors. Variables were tested for normality. The demographic data were analysed using descriptive and inferential statistical tests.

All variables and the total correct score for each question were individually analysed (Ferrell and McCaffery, 2008). After each sectional analysis, an overall score for each section was calculated based on the correct answers of the respondents. This was done to determine the overall score of the highest and lowest correct answers. Parametric tests were performed on selected data to determine any significant difference between co-existing variables.

We selected a cut-off score for adequate knowledge and attitudes in this sample would of 60 or more correct responses rather than the higher score suggested by a previous study (Ferrell and McCaffery 2008). This was done to suit the current observed knowledge and attitude levels amongst our nurses.

Results

Epidemiology

A total of 566 nurses volunteered to participate in this study, giving a response rate of 76%. Most respondents were female (532, 94%), reflecting the current situation in this country where the nursing profession still dominated by women. The majority of the participants were younger than 40 year of age (96.6%), with the predominant age group from 20 to 30 years. Nearly 70% of the participants have worked in the nursing profession for less than 10 years, with mean clinical years of experience of 6.60±4.45 years. Up to 21.2% of respondents were from critical care divisions such as the intensive care unit, high dependency unit and critical cardiac care. Nurses from the surgical department represented 14% of the total respondents, whereas 12.2% were from the paediatric unit, 11.2% were from the obstetric and gynaecological unit and the rest were those from other wards at UKMMC. Most respondents held a recognised diploma in nursing (91.5%),

while less than 1/10 (8.5%) had a bachelor degree in nursing. Out of 566 respondents, 91.5% had never had formal training in pain management at any level. The majority of those who had pain training obtained it during their clinical service training. Up to two-thirds of the nurses had no further professional training apart from their basic nursing program, nor had they attended any refresher courses after completing their nursing training. Table 1 summarises the demographic characteristic of the respondents described above.

Total score

In this study, the mean total score for correct answers was 58.57±9.58. When comparing the mean total score of participants from different wards, oncology nurses scored higher compared to those on general wards and critical care nurses with a score of 63.52±9.27 (p<0.045). General ward and critical care nurses obtained mean total scores of 58.47±8.92 and 58.19±10.69, respectively. The group of nurses with more than the basic qualifications had a higher total correct score compared to those who only had the basic nursing qualification (mean correct score: 60.30±8.17, p<0.003).

Total correct scores reflecting adequate knowledge and attitudes

A total of 77.3% nurses from the oncology ward had a total correct score of more than 60% when compared to general (49.6%) and critical care nurses (49.2%). This was a statistically significant result at p <0.038.

The older nurses in the age group of 40-49 years did

Table 1. Demographic Information of Participants, n=566 (Number and Percentage)

Gender		Female 523 (94.0%)	Male 34 (6.0%)
Age	21-29 year old	298 (952.7%)	
	30-39 year old	249 (44.0%)	
	40-49 year old	19 (3.4%)	
Year of Nursing Experiences	1-5 year	281 (49.6%)	
	6-10 year	156 (27.6%)	
	11-15 year	119 (21.0%)	
	15-20 year	10 (1.8%)	
Ward Representative	Medical	21 (93.7%)	
	Surgery	79 (14.0%)	
	Paediatric	69 (12.2%)	
	Orthopedic	59 (10.4%)	
	O & G	66 (11.7%)	
	Psychiatric	27 (6.5%)	
	Oncology	22 (3.9%)	
	Critical Care	120 (21.2%)	
	Ambulatory	32 (5.7%)	
	Operating Theatre	41 (7.2%)	
	Emergency Department	20 (3.5%)	
Education	Diploma in Nursing	518 (91.5%)	
	Degree in Nursing	48 (8.5%)	
Pain Training	Yes	48 (8.5%)	
	No	518 (91.5%)	
Post Basic Nursing Training	Yes	186 (32.9%)	
	No	380 (67.1%)	

Table 2. Item Analysis of NKAS (section 1) in Order of Percentage of High Correct Responses

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1. Vital signs are always reliable indicators of the intensity of a patient's pain.
 3. Patients who can be distracted from pain usually do not have severe pain
 16. After an initial dose of opioid analgesic is given, subsequent doses should be adjusted according to the individual patient's response.
 19. If the source of the patient's pain is unknown, opioids should not be used during the initial pain evaluation period, as this could mask the ability to correctly diagnose the cause of pain.
 22. Narcotic/opioid addiction is defined as a chronic neurobiologic disease, characterised by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.
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Table 3. Item Analysis of NKAS (section 2) in Order of Percentage of Low Correct Responses

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23. The recommended route of administration of opioid analgesics for patients with persistent cancer related pain
 25. Which of the following analgesic medications is considered the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients?
 26. Which of the following IV doses of morphine administered over a 4 hour period would be equivalent to 30 mg of oral morphine given q 4 hours?
 28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving morphine 200 mg/hour intravenously. Today he has been receiving 250 mg/hour intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new co-morbidity
 32. Which of the following describes the best approach for cultural considerations in caring for patients in pain?
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better than the younger nurses. Up to 73.7% of nurses from this group scored mean total correct points of more than 60, and this was a statistically significant result ($p < 0.001$). Those nurses with more than their basic degree training were found to have more adequate knowledge and attitudes than those without any extra training (mean total score: 60.30 ± 8.17 , $p < 0.002$). When assessing the relationship between the adequacy of knowledge and attitude with gender and years in service, the results showed no significant difference in any group.

Detailed analysis of each individual item

Section 1: Overall, out of 22 questions in part 1, the respondents performed poorly on two questions (questions 4 and 18). Most nurses scored the lowest for item 4, which stated, 'The patient may sleep despite severe pain', with only 13% of the participants able to answer the question correctly. Less than 1/3 of respondents answered correctly for item 18, which stated, 'Tramadol 50 mg PO is approximately equal to 5-10 mg of morphine PO'. The focus of this question was the pharmacotherapeutics component of pain management, particularly in terms of the equi-analgesic conversion dose. Poor knowledge and attitudes among nurses may be reflected in the low correct scores for questions 4 and 18.

Most nurses did well on items 1, 3, 16, 19 and 22 in section 1, with more than 90% of respondents answering the questions correctly (Table 2).

Section 2: In this section, the scores were generally lower than in section 1. Out of 14 questions, the subjects managed to respond appropriately to 6 with confidence. These items were questions 24, 25, 27, 29, 31 and 34. Among these items, most respondents did well for item 25, which tested knowledge about choices of treatment for prolonged moderate to severe pain in cancer patients. Most nurses correctly identified morphine as the drug of choice for this patient population. More than two-thirds of nurses scored badly for items 23, 25, 26, 28 and 32, with less than 15% of the respondents answering item 28 correctly. This item concentrated on knowledge of dosing

and the adverse effects of opioid (Table 3).

Section 3: Section 3 comprised case vignettes where nurses were required to make decisions based on the pain assessment and to indicate the correct intravenous opioid doses. McCaffery et al. (2007) feel that these aspects of NKAS may reflect what the nurses may do in actual clinical scenarios. Overall, most nurses failed to do well in this section, with less than 10% able to respond correctly. Most participants did badly in the first case vignette, with only 10.4% answering question 1 correctly and only 5% reporting the correct answer for question 2. In the second case vignette, up to 44% answered correctly for question 1 and only 10% gave the correct answer for question 2.

Discussion

Until recently, the topic of pain management amongst nurses and health professionals has been poorly taught to undergraduate in Malaysian universities. This may reflect the low level of research conducted by health professionals and medical practitioners. The concrete reasons for the low research interest in this country have never been studied in depth; however, the trend is slowly changing, as evidenced by the introduction of pain as the fifth vital signs in the patient's vital signs clinical record in government-based hospital and health facilities.

Our interest in improving pain education for nurses in this hospital led us to carry out this study in order to understand the knowledge gap and attitudes amongst our nurses. Overall, this study has achieved sufficient data for a good analysis, with a response rate of 76%; this is a reasonable response rate in comparison with previous similar studies (Yildirim et al, 2008; Reiman and Gordon, 2007; Bernardiet al., 2007; Matthews and Malcolm, 2007). The good response rate also helps to minimise sample bias and allows generalisation of the data. In this scenario, the reasons for non-responses were mainly duty hours, inability to fulfil the time requirement, poor acceptance and limited interest from higher management.

In this study, our respondents were mainly younger

nurses (under 40 years old) with less experience in clinical services in comparison to other previous studies (Jarrett et al., 2013; Lewthwaite et al., 2011)). In addition, the majority of these nurses had never been exposed to formal pain management training in their professional life, and this may have been reflected in their responses to case vignettes in section 3 of the NKAS.

The NKAS criterion for minimally acceptable mean total score was recommended to be 80% of the total possible correct score to account for good knowledge and attitudes of nurses in relation to pain management in various settings (McCaffery and Robinson, 2002). It is interesting to note that if a nurse score less than 80%, his or her ability to care for a patient with pain is highly questionable. It was also suggested by the (Ferrell and McCaffery, 2008) that the data obtained should be analysed in terms of the total mean correct score and individual items as it was difficult to differentiate between items measuring knowledge or attitudes. Therefore, an analysis of each item was conducted to determine the positive and negative values of nurses' knowledge and attitudes.

When compared to many previous studies on the NKAS tool in other settings, our results would be considered average responses with a low mean total score (Brown et al., 1999; Broekmans et al., 2004; Tsai et al., 2007; Lui et al., 2008; Wang and Tsai, 2010). Leithwaite et al. reported a total mean correct score of 79%, while a Chinese study on the NKAS survey tool reported a total mean score of 44% from 601 nurses in three different hospitals, and Yildirim et al. gave a mean score of 35.4% (Rahimi-Madiseh et al., 2010).

In the present research, only one nurse scored 80% or greater on the NKAS questionnaire, which indicates that the vast majority of nurses in this study did not reach the threshold of competency suggested by the NKAS founder. This result is far different from a previous study by Lewthwaite et al. where 49% of respondents had scores 80% and above (Yildirim et al., 2008). However, the study modified the original survey questions to 22 true/false questions and used a different cohort of nurses. Most respondents in the Lewthwaite study were older nurses (mean age of 42) and had longer professional work experiences (mean of 17 years) compared to our study population of younger nurses, who were mostly under 40 and had a mean of 6.6 years of working experience (Lewthwaite et al., 2011). However, Lewthwaite et al. (2011) also reported that a post hoc pair-wise comparison showed older nurses (>55 years) to have a lower mean total score than younger nurses.

Our results are consistent with those of a previous study where younger nurses did not do very well, with a lower mean total NKAS score compared to older nurses (McCaffery and Robinson 2002). In addition, the results related to years of experience were similar to those in studies by McCaffery et al. (McCaffery et al., 2002; Lewthwaite et al., 2011).

There are a few reasons why we opted for a lower total correct score (60%) to reflect the respondents' knowledge level and attitudes towards pain management in this study in comparison to what suggested by the

developers of the NKAS instrument. First, the majority of our participants had no training on pain management after their basic nursing qualification, and this would obviously be reflected on their scoring on the NKAS. Second, it is difficult to assess knowledge and attitudes separately based on the items listed in the NKAS, even though certain items may be biased towards knowledge or attitude. Therefore, an overall high total score does not reflect a nurse's better knowledge, good attitude or otherwise. In our setting, some of the items on the NKAS may not have been suitable for studying knowledge or attitudes due to the nature of the questions. For example, question 9 in section 1 is as follows: Research shows that Promethazine (Phenergan) is a reliable potentiator of opioid analgesic. This item was initially modified to suit a general audience, but its relevance of at a very basic level is questionable. Similarly, question 28 in section 2, which aims at testing knowledge on a more detailed dosing regimen, may not be applicable to our study population. The other question is item 33 in section 2, which asks for an exact percentage of the likelihood of patients who have alcohol/drug abuse problems developing pain.

It is interesting to study the nature of the working situation in this hospital to understand why most of our respondents were unable to achieve a higher mean total score. Possible explanations may include that a significant number of the respondents had never had any pain training after they completed their basic nursing education or during their short clinical service year. These factors alone may be debatable, as previous studies by Jastrzab et al. and Lewthwaite et al. showed the opposite (Lewthwaite et al., 2011). Lewthwaite et al. argued that in their post hoc result, younger nurses with fewer years of experience performed well due to their recent formal university education (Reiman and Gordon, 2007). However, this may not reflect the experience of our nurses, as most local universities do not have a formal teaching syllabus for pain and related topics. Therefore, the results reflect on the lack of attention given to the topic of pain and its related areas in past and present local undergraduate and postgraduate teaching curricula. The respect for orders, where individuals "never ask questions" and "do not argue" with those higher in the medical hierarchy, is still common in this part of the country. Therefore, most decisions are made without even consulting nurses, who are the main physical caregivers for patients. Clear communication between patients and nurses and nurses with medication prescribers often play an important role in achieving effective pain management and to enhance patients' rapport (Park et al., 2012; Maskor et al., 2013). Therefore, future research may need to re-examine our nurses' attitudes and communication with other medical professionals.

We can observe that the nurses performed badly in the pharmacotherapeutics core components of the NKAS. These findings were consistent with previous studies, where many respondents reported a significant deficit in knowledge in this area (Jastrzab et al., 2003; Bernardi et al., 2007; Reiman and Gordon, 2007; Lewthwaite et al., 2011v). The domains of deficits are typically in selection of opioids, dosing, routes, side effects and the possibility of addiction. Interestingly, this may reflect back to our

earlier concern that these nurses are not well equipped with the core knowledge in pain management topics and their applications.

In this study, we noticed a consistent pattern where nurses from certain disciplines tend to do well compared to others. For example, nurses from the oncology ward obtained a higher total mean score compared to nurses from other critical disciplines and the general ward. One possible explanation has to do with the nature of their work exposure in dealing with sick patients with a high symptom burden, which makes them more aware or gives them a better understanding of patients' pain.

There are various limitations to this study that prevent us from exploring the actual percentage of nurses' with poor attitudes and poor knowledge. First, it was difficult to recruit a reasonable number of participants from general medical and surgical wards in comparison to critical care and oncology. This may be due to the nature of the patients they encounter, that is, low exposure to patients with pain or negative attitudes toward optimal pain management.

In addition, the NKAS in these circumstances does not help us to differentiate between participants have poor attitudes and those with poor knowledge. Therefore, it is difficult to determine whether our nurses scored poorly on the NKAS due to negative attitudes or low exposure and poor knowledge concerning pain management in general.

More cooperation from management, such as providing flexible time to participate in the study and material encouragement to help the participants to understand the need for the study, may help to increase the response rate in general, especially from the general medical and surgery disciplines.

In conclusion, to the best of our knowledge, this represents the first study in a tertiary hospital in Malaysia to describe a pattern of knowledge and attitudes towards pain management amongst nurses. In general, the results were consistent with previous studies in other countries, especially in Asia, which described poor knowledge and attitudes amongst nurses in managing patients with pain. Our study population consisted of younger nurses with shorter clinical service experience, and the majority with no postgraduate training in many clinical areas of relevance. This may imply that the undergraduate teaching of pain in nursing programmes in this country is still far from adequate, and that a relevant pain education programme is urgently needed. However, nurses from certain disciplines like oncology consistently scored higher than the rest, which may suggest that clinical experience helped to improve their knowledge and attitudes towards patients' pain. Although we did not study the barriers to adequate pain management, we felt that these aspects should be studied in depth in the future, as this will help the relevant authority to understand target areas for improving the knowledge deficit and overcoming barriers to deliver optimum pain management through pain education.

This study clearly indicates an urgent need to improve pain education at a very basic undergraduate level. In addition, in critical areas such as oncology and surgical-based disciplines where pain is a common phenomenon, various steps should be taken to improve our nurses'

clinical experiences in dealing with patients' pain and encourage a positive attitude and working environment which promotes better pain management.

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