

A Cross Sectional Survey on Knowledge Towards Pain Management Among Clinical Year Medical Students of Melaka-Manipal Medical College

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Abstract

Pain, despite being a very common encounter in daily healthcare settings, has been shown to be mismanaged and often left treated inadequately. This has largely been attributed to the lack of training in the area of pain control and its importance. This research was conducted to determine the level of knowledge towards pain management among clinical year medical students of Melaka-Manipal Medical College, Malaysia. A cross-sectional study was conducted among clinical year medical students of Melaka-Manipal Medical College. The knowledge towards pain management was assessed using a validated questionnaire known as “Knowledge and Attitude Survey Regarding Pain” (KASRP) which consists of 39 questions. The data collected was processed using Microsoft Excel and analyzed using the software Epi info version 7.2.2.6. The average total knowledge score percentage of 184 participants was 48.66% (SD = 9.23) which is below the passing mark of 50%. There was significant association between ethnicity and religion and the knowledge of pain management among clinical year medical students. From this study, we found that the knowledge of pain management among clinical year medical students of Melaka-Manipal is unsatisfactory. Emphasis on pain management should therefore be made through continuous education and training of medical students in order to improve the quality of patient care in the future.

Keywords

Pain Management, Medical Students, Knowledge

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1. Introduction

Pain is a complex protective mechanism and an essential part of evolution that indicates the body is in danger and harm. It is defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” [1]. It is the most disturbing symptom experienced by most of the patients and is a subjective symptom that affects many hospitalized patients and considered an integral part of human experience [2]. Pain may have debilitating effects on a patient’s physical, emotional and spiritual wellbeing and thus, can alter their quality of life. Recently, it was suggested to be measured as

one of the vital signs [2, 3]. Even with growing awareness about the pathophysiology of pain and many advancements in the pharmacological sector and the new introduction of psychological control of pain, many patients still experience its intolerable effects [4, 5]. This points towards an error occurring with the implementation of proper pain relief. Lack of knowledge in this area of practice may yield negative attitudes toward pain management and add to the complexity of pain management [6, 7]. Patients may become dissatisfied with the pain management strategy that is being implemented, which may also alter the state of confidence between patient and healthcare provider. [8-10]. Therefore pain control has become an integral component of the

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management of long-term hospitalized patients ranging from cancer patients to those with chronic kidney and liver disease in order to break the vicious cycle of disease-causing pain and untreated pain aggravating the disease [11].

The accurate assessment of pain is held responsible by healthcare professionals in any healthcare setting. The assessment of pain when done poorly will contribute to underestimating the patient's pain level which will result in anxiety and cause discomfort to the patient [12-14]. Furthermore, an optimal and accurate assessment of pain would enhance positive communication between healthcare professionals in which all parties perceive the precise level and tolerance of the patient while undergoing any medical procedure [15-17].

Since healthcare professionals deal with patients in pain on a daily basis, they should have a clear knowledge and attitude towards the treatment of pain. However worldwide surveys continue to reveal the lack of knowledge thereof. Many barriers to this have been identified like a misconception, lack of knowledge and poor attitude towards pain. Myths about pain and pharmacological pain treatment, particularly fear of opioids addiction as well as serious adverse effects like respiratory depression and the misconception that patients tend to seek attention rather than report real pain, are blamed for pain under treatment [16, 17]. There is inconsistency, however, between practice and attitude, which suggests that nurses may have a positive attitude toward pain management but do not have adequate knowledge to manage pain correctly and completely [18, 19]. Furthermore, nurses who have low salaries and have role confusion in pain management are usually the ones who have poor knowledge of pain management [20].

Physicians' knowledge and attitudes about pain have been explored also, although perhaps to a lesser extent than nurses'. A study conducted about the matter at hand in Korea found that even physicians do not have adequate knowledge about pain management [21]. After analysis of data obtained from a cross-sectional survey done in Palestine, similar results was obtained as the mean score regarding knowledge on cancer pain management was only 6.2 out of 14 [22].

With regard to the attitude of nursing students towards the same, Duke et al found that students answered 63% of the questions correctly and the nursing faculty 71%. They also found that nursing students tended to assign higher pain scores and administer higher doses of morphine to symptomatic patients (i.e. those who were moaning, crying and shouting) compared with asymptomatic ones [23].

Many studies done across the world have concluded a negative attitude and poor knowledge towards pain control among practicing physicians and nurses, which poses the

question of whether this problem is rooted in the lack of undergraduate teaching of this subject; under perhaps the subject of palliative medicine [21-23]. Moreover, research has revealed that there may be inadequate pain education and training in nursing schools [24].

A previous review showed, despite the diversity of standardized instruments that have been used to assess knowledge, perceptions, and attitudes to pain management, the literature has consistently reported that knowledge about pain management among nursing and medical students was generally poor among both groups [23]. One cross-sectional study conducted in an Ethiopian university among 422 medical and paramedical students using the KASRP (Knowledge and Attitude Survey Regarding Pain) tool showed that the overall percentage of correct answers was 52.3%. Only 4.2% of the students scored above the cutoff point (70%) for good knowledge regarding pain management. Nevertheless, though paradoxical, 73% of the participants responded that they have adequately learned about pain management in their academic carriers [25].

There is a paucity of literature about medical students' knowledge regarding pain management in Malaysia in current literature. A study about the knowledge and attitude of nurses towards pain management has been conducted in Malaysia but not among medical students. Therefore, we are conducting this study to determine the level of knowledge possessed by clinical year medical students towards pain management. From the data collected we would also like to further explore to see if there is any association between age, academic semester and knowledge towards pain management and also any possible effect of ethnicity, religion and nationality on the same as these factors can give rise to various cultural beliefs and myths that interfere with the perspective of pain management. We hypothesized that the knowledge towards pain management would be different between different age, gender, ethnicity, religion and academic semester among undergraduate students.

2. Methods

2.1. Study Design, Setting, Time and Population

The study was a cross-sectional study conducted among medical students of a private medical college, Melaka-Manipal Medical College (MMMC), Muar campus, Johor in Malaysia. This study was carried out from December 2019 to January 2020 over a period of 6 weeks. This college consists of students of medical faculty, dental faculty and foundation in Science. Under the medical faculty, there is a total of 750

students who are studying for 10 semesters. Semesters 1 to 5 are conducted in the campus in Manipal, India while the remaining semesters 6 to 10 are conducted here, in the Malaysian campuses in Muar (Johor) and Melaka. There are approximately 300 students in the Muar campus. In this study, we have included the medical students of semester 6 and 7 in the Muar campus as the participants.

2.2. Sample Size

The sample size of this study was calculated using a sample size calculator from the application Epi Info called StatCalc. The minimum sample size needed was calculated as shown below:

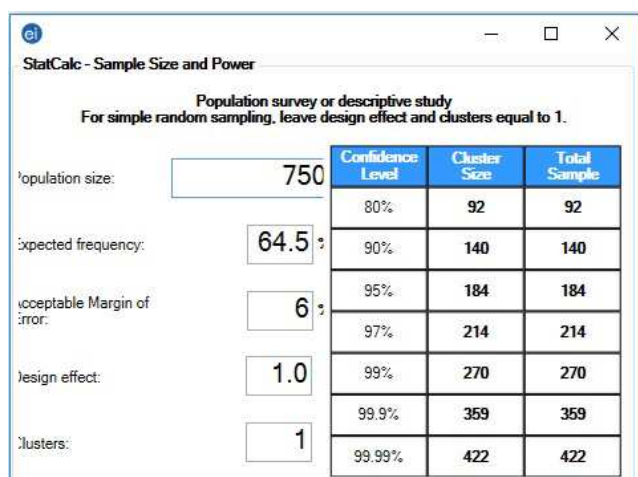


Figure 1. Screenshot of sample size calculation made using StatCalc on the software, Epi Info.

Application used: Epi Info - StatCalc

Population size: 750

Expected frequency: 64.5% (Mean knowledge score of KASRP) [28]

Acceptable Margin of Error: 6%

Minimum sample size with 95% confidence level: 184

$$n_{\text{sample size}} = \frac{n_{\text{calculated}}}{1 - \text{nonresponse rate (\%)}}$$

$$n_{\text{sample size}} = \frac{184}{(1 - 0.2)} = 230$$

The minimum sample size collected using the application was 184. However, after calculating the nonresponse rate of 20%, the final sample size obtained for the study was 230.

2.3. Sampling

The sampling method used in this study was purposive sampling. Melaka-Manipal Medical College's students of the medical faculty of semester 6 and 7 from the Muar campus were selected to participate in this study. The inclusion criteria were medical students of Melaka Manipal Medical College in semester 6 and 7 who are willing to give

consent to participate in the study, and participants being present at the time of distribution of the questionnaires. The exclusion criteria were students who did not consent for the study, absentees at the time of distribution of questionnaires, and those who failed to answer all the questions of the survey.

2.4. Data Collection

The data was collected from Melaka Manipal Medical College students by distributing a validated questionnaire which consists of 39 questions. The questionnaire used is known as "Knowledge and Attitude Survey Regarding Pain" (KASRP) developed by Betty Ferrell, RN, PhD, FAAN and Margo McCaffery, RN, MS, FAAN [26]. The questionnaire consists of 4 parts with the first part containing the demographic data of participants such as age, gender, nationality, ethnicity, religion and academic semester. Second part consists of 22 true/false questions. Statements such as "Patients may sleep in spite of severe pain", "Patients who can be distracted from pain usually do not have severe pain" were given and participants have to answer from the options true or false. The third part of the questionnaire consists of 15 multiple choice questions. The fourth part of the questionnaire consists of 2 case study questions to test the participants' knowledge on assessing the severity of pain by asking them to mark on the pain scale given and to also make decisions on what medication to be administered to the patient. Case scenarios of postoperative patients were given and the participants were asked to rate the pain score based on the patient's facial expression and patient's own rating of the pain score. Participants were also asked to answer what dosage of morphine should be administered to the patient. For all true/false, multiple choice questions and case study questions, 0 marks were given to the wrong answer and 1 mark was given to correct answer. Then, total score was calculated for each participant.

2.5. Data Processing & Analysis

The raw data was collected via self-administered questionnaires and then processed using Microsoft Excel. The data from Microsoft Excel was then analyzed using the application Epi info version 7.2.2.6. The frequency and percentage of qualitative variables from the demographic data of participants such as age, gender, ethnicity, nationality, religion and current semester of MBBS course were calculated. The mean, standard deviation, minimum and maximum value of the quantitative variable which is the score of knowledge of medical students towards pain management were calculated. The level of significance for p-value selected is 0.05.

Table 1. Variables assessed and the statistical tests used.

Independent variable	Dependent variable	Statistical test
Gender	Score of KASRP	Unpaired t-test
Age	Score of KASRP	ANOVA
Academic semester	Score of KASRP	Unpaired t-test
Nationality	Score of KASRP	Unpaired t-test
Ethnicity	Score of KASRP	ANOVA
Religion	Score of KASRP	ANOVA
Knowledge on pain management prior to enrolling into MMMC	Score of KASRP	Unpaired t-test

2.6. Ethical Consideration

This research was approved by the Research Ethics Committee, Faculty of Medicine, Melaka Manipal Melaka College, Malaysia. A signed informed consent sheet attached to the questionnaire was obtained from every participant which contained the reasons and objectives of the study. This was to ensure that the participants understood exactly what sort of study they were participating in. All participants were given the reassurance that their participation is completely voluntary and that they were free to withdraw their consent at any point in the study without reason. The participants' information was kept confidential and used only for the purpose of this research. Their anonymity and privacy were maintained.

3. Results

Table 2. Sociodemographic characteristics of clinical year medical students.

Variables	Frequency of correct responses n (%)
Age	
≤22	53 (28.80%)
22-25	128 (69.57%)
≥25	3 (1.63%)
Mean (SD)	23.23 (1.40)
Minimum-Maximum	20-32
Gender	
Male	109 (59.24%)
Female	75 (40.76%)
Ethnicity	
Chinese	41 (22.28%)
Indian	64 (34.78%)
Malay	35 (19.02%)
Others	44 (23.91%)

Table 3. Frequency and percentage of correct answers for True/False questions among clinical year medical students.

True/False Questions	Frequency of correct response n(%)
1. Vital signs are always reliable indicators of the intensity of a patient's pain. (FALSE)	78 (42.39%)
2. Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences. (FALSE)	97 (52.72%)
3. Patients who can be distracted from pain usually do not have severe pain. (FALSE)	63 (34.24%)
4. Patients may sleep in spite of severe pain. (TRUE)	56 (30.60%)
5. Aspirin and other nonsteroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases. (FALSE)	84 (45.65%)
6. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. (TRUE)	72 (39.13%)
7. Combining analgesics that work by different mechanisms (e.g., combining an NSAID with an opioid) may result in better pain control with fewer side effects than using a single analgesic agent. (TRUE)	132 (71.74%)
8. The usual duration of analgesia of 1-2 mg morphine IV is 4-5 hours. (FALSE)	50 (27.17%)
9. Opioids should not be used in patients with a history of substance abuse. (FALSE)	62 (33.70%)
10. Elderly patients cannot tolerate opioids for pain relief. (FALSE)	136 (73.91%)
11. Patients should be encouraged to endure as much pain as possible before using an opioid. (FALSE)	84 (45.65%)

Variables	Frequency of correct responses n (%)
Religion	
Buddhism	47 (25.54%)
Christian	
Hinduism	28 (15.22%)
Islam	58 (31.52%)
Others	43 (23.37%)
Nationality	8 (4.35%)
Malaysian	32 (17.39%)
International	
Semester	
6	69 (37.5%)
7	115 (62.5%)
Prior knowledge of pain management	
Yes	54 (29.35%)
No	130 (70.65%)

Table 2 shows the frequency of each variable in the sample of 184 students.

The mean age of the sample is 23.14 (SD = 1.40) ranging from 22-32 years. Most of the participants were 22-25 years of age (69.57%) while only 1.63% were older than 25 years and 28.8% younger than 22 years.

More males (59.24%) participated compared to females (40.76%).

The participants were of various ethnic groups out of which most were Indian (34.78%) followed by others (23.91%), Chinese (22.28%) and Malay (19.02%).

The students who took part also followed various religions among which most were Hindu (31.52%) followed by Buddhists (25.54%), Islamic (23.37%), Christians (15.22%) and others (4.35%).

All students were broadly categorised into two nationalities; Malaysian and International (Sri Lankan, Maldivian and Indian). The proportion of Malaysian students was much higher (82.61%) compared to the International students (17.39%).

True/False Questions	Frequency of correct response n(%)
12. 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)	106 (57.61%)
13. Patients' spiritual beliefs may lead them to think pain and suffering are necessary. (TRUE)	142 (77.17%)
14. After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient's response. (TRUE)	160 (86.96%)
15. Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. (FALSE)	52 (28.26%)
16. Vicodin (hydrocodone 5 mg + acetaminophen 300 mg) PO is approximately equal to 5-10 mg of morphine PO. (TRUE)	107 (58.15%)
17. 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)	32 (17.39%)
18. Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose. (FALSE)	94 (51.09%)
19. Benzodiazepines are not effective pain relievers and are rarely recommended as part of an analgesic regimen. (TRUE)	109 (59.24%)
20. Narcotic/opioid addiction is defined as a chronic neurobiologic 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)	157 (85.33%)
21. 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)	135 (73.37%)
22. Sedation assessment is recommended during opioid pain management because excessive sedation precedes opioid-induced respiratory depression. (TRUE)	157 (85.33%)

Table 2 illustrates the frequency of correct answers for true and false questions. The question that had the highest response rate was question 14 where 86.96% knew that opioid doses should be adjusted according to patient's response. Questions 22 and 24 also had correct response rates of more than 80%, which showed 85.33% knew the correct definition of narcotic/opioid addiction and also that assessment of sedation preceded that of respiratory depression.

Nine more questions were also answered correctly by more than 50% of the participants. 51.09% knew that one does of gabapentin is not adequate. 52.72% knew that children under 2 years have pain sensitivity and memory of pain and 57.61% knew that children under 11 years can report pain on their own. 58.15% of the students knew how to calculate the dose of morphine equivalent to that of Vicodin. 59.24% of the students knew that benzodiazepines are not effective pain relievers. 71.74% knew that analgesic combinations are more effective with less side effects than single agents. 73.91% correctly believed that elderly patients can tolerate opioids. 77.1% knew that patients' spiritual beliefs influenced their perception of management of pain. 73.37% of the participants correctly knew the term 'equianalgesia'.

Therefore the remaining 10 questions were answered correctly by only less than 50% of the sample. 42.39% of the students knew that vital signs are not always reliable indicators of the intensity of pain. 34.24% knew that ability to be distracted from pain is not related to its severity. 30.60% of the sample correctly knew that patients may sleep in spite of severe pain. 40.65% of the students correctly believed that aspirin and other NSAIDs are effective analgesics for painful bone metastases. 39.13% of the students correctly believed that respiratory depression rarely occurs in patients on long-term analgesics. 27.17% knew that the duration of morphine is not 4-5 hours. 33.7% of the students knew that opioids can be used in patients with a history of substance abuse. 45.65% did not have the false belief that Only 28.26% of the participants knew that giving patients sterile water by injection is not a test done to determine if the pain is real. The lowest correct response rate was for question 17 to which only 17.96% knew that opioids should be used even during the pain evaluating period.

Hence, only 12 out of 22 questions were answered correctly by more than 50% of the sample which shows that knowledge about pain management is not satisfactory.

Table 4. Frequency and percentage of correct answers for multiple choice questions among clinical year medical students.

Multiple Choice Questions	Frequency of correct responses n(%)
23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is _____. (oral)	37 (20.11%)
24. The recommended route administration of opioid analgesics for patients with brief, severe pain of sudden onset such as trauma or postoperative pain is _____. (intravenous)	126 (68.48%)
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? (morphine)	110 (59.78%)
26. A 30 mg dose of oral morphine is approximately equivalent to _____. (Morphine 10mg IV)	83 (45.11%)
27. Analgesics for post-operative pain should initially be given (around the clock on a fixed schedule)	108 (58.70%)
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 comorbidity is (less than 1%)	29 (15.76%)
29. The most likely reason a patient with pain would request increased doses of pain medication is (the patient is experiencing increased pain)	143 (77.72%)
30. Which of the following is useful for treatment of cancer pain? (All of the above)	67 (36.41%)

Multiple Choice Questions	Frequency of correct responses n(%)
31. The most accurate judge of the intensity of the patient's pain is: (the patient)	138 (75.00%)
32. Which of the following describes the best approach for cultural considerations in caring for patients in pain: (Patients should be individually assessed to determine cultural influences)	80 (43.48%)
33. How likely is it that patients who develop pain already have an alcohol and/or drug abuse problem? (5-15%)	96 (52.17%)
34. The time to peak effect for morphine given IV is (15 minutes)	98 (53.26%)
35. The time to peak effect for morphine given orally is (1-2 hours)	81 (44.02%)
36. Following abrupt discontinuation of an opioid, physical dependence is manifested by the following: (sweating, yawning, diarrhea and agitation with patients when the opioid is abruptly discontinued.)	65 (35.33%)
37. Which statement is true regarding opioid induced respiratory depression: (Obstructive sleep apnea is an important risk factor.)	67 (36.41%)

Table 3 shows the frequency and percentage of correct responses for multiple choice questions among the clinical year medical students. The percentage of correct responses about the route of drug administration for persistent cancer related pain and severe pain of sudden onset was 20.11% and 68.48% respectively. Approximately 59.78% of participants answered the question for the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients correctly. 45.11% of the participants answered correctly regarding how much 30 mg dose of oral morphine is equivalent to. 58.70% of participants answered when the analgesics for postoperative pain should initially be given correctly. Approximately 15.76% of the participants answered correctly regarding the likelihood of the patient developing clinically significant respiratory depression. 77.72% of the participants answered the most likely reason a patient with pain would request increased doses of pain

medication correctly. For the question regarding the drug which is useful for treatment of cancer pain was answered correctly by 36.41% of the participants. The percentage of correct responses for the question regarding the most accurate judge of the intensity of the patient's pain is 75%. 43.48% of the participants chose the correct statement that describes the best approach for cultural considerations in caring for patients in pain. Approximately 52.17% of participants knew the correct answer for how likely patients who develop pain already have an alcohol and/or drug abuse problem. The time to peak effect for morphine given IV and orally were answered correctly by 53.26% and 44.02% of the participants respectively. The percentage of correct responses for the question regarding the manifestation of physical dependence following an abrupt discontinuation of an opioid is 35.33%. 36.41% of the participants chose the correct statement regarding opioid induced respiratory depression.

Table 5. Frequency and percentage of correct answers for case studies questions among clinical year medical students.

Case Studies Questions	Frequency of correct responses (%)
38. A. Patient A: Andrew is 25 years old and this is his first day following abdominal surgery. As you enter his room, he smiles at you and continues talking and joking with his visitor. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Andrew's pain (8)	37 (20.11%)
38. B. Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you will take at this time. (Administer morphine 3 mg IV now.)	6 (3.26%)
39. A. Patient B: Robert is 25 years old and this is his first day following abdominal surgery. As you enter his room, he is lying quietly in bed and grimaces as he turns in bed. Your assessment reveals the following information: BP = 120/80; HR = 80; R = 18; on a scale of 0 to 10 (0 = no pain/discomfort, 10 = worst pain/discomfort) he rates his pain as 8. On the patient's record you must mark his pain on the scale below. Circle the number that represents your assessment of Robert's pain (8)	85 (46.20%)
39. B. Your assessment, above, is made two hours after he received morphine 2 mg IV. Half hourly pain ratings following the injection ranged from 6 to 8 and he had no clinically significant respiratory depression, sedation, or other untoward side effects. He has identified 2/10 as an acceptable level of pain relief. His physician's order for analgesia is "morphine IV 1-3 mg q1h PRN pain relief." Check the action you will take at this time. (Administer morphine 3 mg IV now)	50 (27.17%)

Table 4 shows the frequency and percentage of correct answers for case studies among clinical year medical students. 20.11% of the participants had marked the pain score correctly for the case study question in which a postoperative patient who smiles and jokes with the visitors but still rated his pain 8 on a scale of 1 to 10. For the next sub question, it had the lowest number of correct responses which means only 3.26% of the participants knew what subsequent dose of morphine

should be administered to that patient. The next case study question had the highest number of correct responses which means 46.20% of the participants knew what pain score should be given to another postoperative patient who lies quietly on the bed and grimaces when he turns on the bed whereas for the next sub question, 27.17% of the participants have answered the subsequent dosage of the morphine that should be administered to that patient correctly.

Table 6. Knowledge score for each domain of the KASRP questionnaire.

Domain	Mean (SD)	Min-Max	Total
True/False (0-22)	11.67 (2.48)	5-19	22
Multiple Choice Questions (0-15)	7.22 (3.74)	1-13	15
Case studies (0-4)	0.97 (1.03)	0-4	4
Total knowledge score (0-41)	19.95 (14.31)	12-31	41
Total knowledge score percentage (0-100)	48.66 (9.23)	29.27 - 75.61	100

Table 5 shows the knowledge score for each domain of the KASRP questionnaire. For the true/false questions, the mean score was 11.67 (SD = 2.48). For the multiple choice questions, the mean score was 7.22 (SD = 3.74) whereas for

the case study questions, the mean score was 0.97 (SD = 1.03). The mean score of the total knowledge score is 19.95 (SD = 14.31). The mean score for total knowledge score percentage is 48.66 (SD = 9.23).

Table 7. Association between socio-demographic data and knowledge on pain management among clinical year medical students.

Variables	Knowledge mean (SD)	Mean difference (95% CI)	t (df)/F (df1/df2)	P value
Gender				
Male	47.32 (10.02)	2.27	1.65 (182)	0.101
Female	49.59 (8.56)	(-0.45 to 4.99)		
Ethnicity				
Chinese	46.58 (8.37)			
Indian	47.29 (9.33)	-	-	0.034
Malay	49.90 (8.25)			
Others	51.61 (9.34)			
Religion				
Buddhism	47.43 (8.34)			
Christian	50.96 (9.33)			
Hinduism	46.05 (9.27)	-	-	<0.001
Islam	50.09 (7.92)			
Others	59.15 (11.42)			
Nationality				
Malaysian	48.51 (9.11)	0.88	0.49 (182)	0.624
International	49.39 (9.87)	(-2.67 to 4.43)		
Semester				
6	49.49 (8.09)	-1.32	-0.94 (182)	0.348
7	48.17 (9.85)	(-4.09 to 1.45)		
Prior knowledge of pain management				
Yes	47.79 (9.06)	1.24	0.83 (182)	0.409
No	49.02 (9.31)	(-1.71 to 4.19)		

Table 6 describes the association between gender, ethnicity, religion, nationality, academic semester and prior knowledge of pain management and knowledge on pain management among clinical year medical students.

For gender, the mean knowledge percentage score among males was found to be 47.32% (SD= 10.02) which is slightly lower than the females with a mean score of 49.59% (SD=8.56). The mean difference is 2.27 with a 95% CI range of -0.45 to 4.99. This shows the association between gender and knowledge is insignificant. The p-value is 0.101, hence there is no significant association between gender and knowledge of clinical year medical students on pain management.

For ethnicity, the participants from other ethnic groups have a mean of 51.61% (SD=9.34) which is the highest among all ethnic groups. The Malays have a mean score of 49.90% (SD=8.25) followed by Chinese with a mean score of 46.58% (SD=8.37) and Indians with a mean score of 47.29% (SD=9.33). The p-value is 0.034 which shows that there is a

significant association between ethnicity and knowledge of clinical year medical students on pain management.

For religion, the highest mean score belonged to participants of other religions with a mean score of 59.15% (SD=11.42). Muslims have a mean score of 50.09% (SD=7.920) followed by Christians with a mean score of 50.96% (SD=9.33), Buddhists with a mean score of 47.43% (SD=8.34), and Hindus with a mean score of 46.05% (SD=9.27). The p-value is less than 0.001, hence, there is significant association between religion and knowledge of clinical year medical students on pain management.

For nationality, Malaysians have a mean score of 48.51% (SD=9.11) while the international students have a mean score of 49.39% (SD=9.87). The mean difference is 0.88 with a 95% CI range of -2.67 to 4.43 making the association between nationality and knowledge on pain management insignificant. The p-value is 0.624, hence there is no significant association between nationality and the knowledge of clinical year medical students on pain management.

Students of semester 6 have a mean score of 49.79% (SD=9.06) which is slightly higher than the students of semester 7 with a mean score of 49.02% (SD=9.31). The mean difference is -1.32 with a 95% CI range of -4.09 to 1.45. This shows that there is no significant association between academic semester and the knowledge. The p-value is 0.348, hence there is no significant association between academic semester and knowledge of clinical year medical students on pain management.

Students with prior knowledge on pain management have a mean score of 47.79% (SD= 9.06) while students with no prior knowledge on pain management have a mean score of 49.02% (SD=9.31). The mean difference is 1.24 with a 95% CI range of -1.71 to 4.19. This shows that there is no significant association between prior knowledge of pain management and the knowledge of pain management in the study. The p-value is 0.409, hence the association between prior knowledge and the knowledge of pain management in this study is not significant.

4. Discussion

A cross-sectional study was conducted among undergraduate students of Melaka-Manipal Medical College to determine the level of knowledge possessed by clinical year medical students towards pain management.

The questionnaire used in this study consisted of True/False questions, Multiple Choice Questions (MCQs) and Case Studies. In this study, the mean score for the True/False questions was 11.67 out of 16 questions in total ranging from 5-19. The mean score of MCQs was 7.22 out of a total of 15 questions with a range of 1-13. The mean score for the case studies questions was 0.97 out of a total of 4 ranging from 0-4. The mean of the total knowledge score of 184 participants is 19.95 out of a total of 41 which is 48.66%. This value shows that the knowledge of pain management among clinical year medical students is not optimal since it is below the passing marks of 50%. In another study done using the same KASRP questionnaire among registered nurses in Zimbabwe, it was found that the mean knowledge score percentage was 64.50% [27]. This was supported by another study conducted among hospice nurses in a southeastern state in the United State of America showed a mean knowledge score of 63.08% [30]. The results of mean knowledge score percentage among practising nurses is comparatively higher compared to medical students who still lack training in the aspect of pain management. However, a study conducted in a hospital in Singapore among registered nurses showed that the mean knowledge score percentage was only 23.2% [32].

From this study, we found that there is no significant association between gender, nationality, academic semester,

and prior knowledge of pain management on the knowledge of pain management among clinical year medical students. However, there is significant association between ethnicity and religion on the knowledge of pain management among clinical year medical students.

We found that participants from other ethnic groups have the highest knowledge with a mean score percentage of 51.61% followed by Malay (49.90%), Chinese (46.58%) and Indian (47.29%). Religion has been shown to have a significant association with the knowledge of pain management among clinical year medical students. The highest mean knowledge percentage belonged to participants from other religious groups besides Buddhism, Hinduism and Islam. Participants of 'other' religious group had a mean score percentage of 59.15% followed by Christianity (50.96%), Islam (50.09%), Buddhism (47.43%) and Hinduism (46.05%).

Although there is no significant association between gender and knowledge on pain management, we found that females have a higher mean score compared to males with a mean score percentage of 49.49% over 47.32%. In a previous study conducted about nurses' knowledge on pain management in high acuity care units in Palestine, it was found that the mean score among males (52.8%) was higher than that of females (47.2%) but it was not significant [28]. Moreover, we found that international students have a higher knowledge on pain management compared to Malaysian students with a mean score percentage of 49.39% to 48.51%. This is however of no significance. This result is supported by the findings of another study conducted in New Zealand among nurses across five district health boards where there was no difference in the knowledge of pain management between nurses who had trained in New Zealand and those who trained overseas [35].

Furthermore, despite not having any significant association, it is shown that the students of academic semester 6 who have much lesser clinical exposure compared to the students of academic semester 7 have higher knowledge on pain management. Students of semester 6 have a mean score percentage of 49.49% as compared to the score of 48.17% of semester 7 students. One study conducted among nurses in the oncology department in Turkey showed positive correlation between nurses' pain knowledge and the length of working in the oncology department [15]. In a study conducted among health care providers in Saudi Arabia, a significant difference between the knowledge on pain management was found between physicians and nursing staff. The mean knowledge score percentage of physicians was 48.00% while the same was found to be only 40.31% among nurses [31]. Another similar study done in the United States among paediatric nurses revealed that the mean knowledge percentage of the novice group of nurses was significantly lower than the nurses

with more than 2 years of nursing experience [33]. However, contradictory findings were received by a similar study done among nurses in Malaysia that showed that nurses who scored more than 50% were higher among those who had less than 3 years of experience (33%) compared to those who had more than 3 years of experience (27%) although this was not significant [34].

Having prior knowledge about pain management unexpectedly had no effect on the knowledge score obtained via the KASRP questionnaire. In this study, students with prior knowledge had scored 47.79% while those without have scored 49.02%. However, this finding was not significant based on the statistical tests conducted. Results obtained by a study conducted in Malaysia regarding pain management among medical ward nurses showed that 30% of the nurses who received in-service education in pharmacological intervention for pain scored more than 50% for pain management score compared to 27% of the ones who did not receive any education, even though this was not a significant finding [34]. In another previous study conducted among nurses in Saudi Arabia, it was found that nurses with previous pain education have a higher score of 50.60% compared to those without previous pain education with a score of 49.40%. This result was however not significant [29].

There were a few limitations in this study. Students from the senior semesters, semester 8, 9 and 10 were excluded from this study. Since this is a cross sectional study design which is conducted in a specific point in time, it has a limitation where the change in the knowledge of the participants towards pain management as they progress to the next semester cannot be observed. Another limitation is the fact that only students from one college participated in this study and the results cannot be generalized to other medical colleges.

Based on the results of this study, we recommend that pain management should be a part of the curriculum for medical students in their preclinical years so that they can apply this knowledge once they are in the clinical phase and also when they start practising as doctors. It is also advisable to include pain management for every clinical posting as pharmacological pain control varies with each clinical subject. We suggest that workshops on pain management should be conducted with aims of improving the knowledge of clinical year medical students towards pain management. For future studies on the knowledge of pain management, a pre- and post-test evaluation using the same KASRP questionnaire following educational programmes would be of more value as the effect of exposure to adequate knowledge on pain management would be reflected in the mean knowledge of the participants.

5. Conclusion

In conclusion, the knowledge of pain management among clinical year medical students is unsatisfactory. The overall mean percentage of knowledge score is 48.66% which is slightly below the passing mark of 50%. There is significant association between ethnicity and religion with knowledge of clinical year medical students. This can be attributable to the fact that various cultural beliefs and myths interfere with the perspective of pain management. Therefore, continuous education and training is therefore crucial to improve the quality of patient care in the future.

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References

- [1] IASP Terminology. (n.d.). Retrieved from <https://www.iasp-pain.org/terminology?navItemNumber=576#Pain>.
- [2] J. A. Davis, R. L. Robinson, L. T. Kim & J. Xie, Incidence and impact of pain conditions and comorbid illnesses, *Journal of Pain Research* 4 (2011) 331–345.
- [3] M. K. Merboth & S. Barnason, Managing pain: the fifth vital sign, *Journal of Nursing Clinical North America* 35 (2000) 375–383.
- [4] Eaton LH, Meins AR, Mitchell PH, Voss J, Doorenbos AZ. Evidence-based practice beliefs and behaviors of nurses providing cancer pain management: A mixed-methods approach. *Oncol Nurs Forum*. 2015; 42: 165–73. [PMC free article] [PubMed] [Google Scholar]
- [5] Pereira Dames LJ, Herdy Alves V, Pereira Rodrigues D, De Souza B, Rangel R, Do Valle Andrade Medeiros F, et al. Nurses' practical knowledge on the clinical management of neonatal pain: A descriptive study. *Online Brazilian J Nurs*. 2016; 15: 393–403. [Google Scholar]
- [6] E. Manias, M. Botti, T. Bucknall, Observation of pain assessment and management-the complexities of clinical practice, *Journal of Clinical Nursing* 11 (2002) 724–33.
- [7] N. Rejeh, F. Ahmadi, E. Mohammadi, A. Kazemnejad & M. Anooosheh, Nurses' experiences and perceptions of influencing barriers to postoperative pain management, *Scandinavian Journal of Caring Science* 23 (2009) 274–281. 100 *International Journal of Advanced Nursing Studies*.

- [8] A. McKinlay & S. Cowan, Student nurses' attitudes towards working with older patients, *Journal of Advanced Nursing* 43 (2003) 298–309.
- [9] J. Hamilton & L. Edgar, A survey examining nurses' knowledge of pain control, *Journal of Pain and Symptom Management* 7 (1992) 18–26.
- [10] J. L. Young, F. M. Horton & R. Davidhizar, Nursing attitudes and beliefs in pain assessment and management, *Journal of Advanced Nursing* 53 (2006) 412–421.
- [11] Bartoszczyk DA, Gilbertson-White S. Interventions for nurse-related barriers in cancer pain management. *Oncol Nurs Forum*. 2015; 42: 634–41. [PMC free article] [PubMed] [Google Scholar]
- [12] L. Lui, D. So & D. Fong, Knowledge and attitudes regarding pain among nurses in Hong Kong medical units, *Journal of Clinical Nursing* 17 (2008) 2014–2021.
- [13] D. Al-Shaer, P. D. Hill & M. A. Anderson, Nurses' knowledge and attitudes regarding pain assessment and intervention, *Medical Surgical Nursing* 20 (2011) 30–39.
- [14] C. Goodrich, Students' and faculty members' knowledge and attitudes regarding pain management: a descriptive survey, *Journal of Nursing Education* 45 (2006) 108–117.
- [15] Y. K. Yildirim, F. Cicek & M. Uyar, Knowledge and attitudes of Turkish oncology nurses about cancer pain management, *Pain Management Nursing* 9 (2008) 17–25. B. Wilson, Nurses' knowledge of pain, *Journal of Clinical Nursing* 16 (2007) 1012–1020.
- [16] L. Y. Lin & R. H. Wang, Abdominal surgery, pain and anxiety: preoperative nursing intervention, *Journal of Advanced Nursing* 51 (2005) 252–260.
- [17] B. Wilson, Nurses' knowledge of pain, *Journal of Clinical Nursing* 16 (2007) 1012–1020.
- [18] Ekim A, Ocakçı AF. Knowledge and attitudes regarding pain management of pediatric nurses in Turkey. *Pain Manag Nurs*. 2013; 14: e262–7. [PubMed] [Google Scholar]
- [19] Voshall B, Dunn KS, Shelestak D. Knowledge and attitudes of pain management among nursing faculty. *Pain Manag Nurs*. 2013; 14: e226–35. [PubMed] [Google Scholar]
- [20] Kassa R, Kassa G. Nurses' attitude, practice and barriers toward cancer pain management, *Addis Ababa, Ethiopian. J Cancer Sci Ther*. 2014; 6: 483–7. [Google Scholar]
- [21] Jho, H. J., Kim, Y., Kong, K. A., Kim, D. H., Choi, J. Y., Nam, E. J., ... Park, E. J. (2014). Knowledge, Practices, and Perceived Barriers Regarding Cancer Pain Management Among Physicians and Nurses In Korea: A Nationwide Multicenter Survey. *PLoS ONE*, 9 (8). doi: 10.1371/journal.pone.0105900
- [22] Samara, A. M., Toba, H. A., & Zyoud, S. E. H. (2018). Physicians' knowledge, perceived barriers, and practices regarding cancer pain management: a cross-sectional study from Palestine. *Applied Cancer Research*, 38 (1). doi: 10.1186/s41241-018-0066-8
- [23] Ung, A., Salamonson, Y., Hu, W., & Gallego, G. (2015). Assessing knowledge, perceptions and attitudes to pain management among medical and nursing students: a review of the literature. *British Journal of Pain*, 10 (1), 8–21. doi: 10.1177/2049463715583142
- [24] Keyte, D., & Richardson, C. (2011). Re-thinking pain educational strategies: Pain a new model using e-learning and PBL. *Nurse Education Today*, 31 (2), 117–121. doi: 10.1016/j.nedt.2010.05.001
- [25] H, M. A. A. (2014). Knowledge And Attitude Towards Pain Management Among Medical And Paramedical Students Of An Ethiopian University. *Journal of Pain & Relief*, 03 (01). doi: 10.4172/2167-0846.1000127
- [26] "Knowledge and Attitudes Survey Regarding Pain" developed by Betty Ferrell, RN, PhD, FAAN and Margo McCaffery, RN, MS, FAAN, (<http://prc.coh.org>), revised 2014.
- [27] Manwere, A., Chipfuwa, T., Mukwamba, M. M., & Chironda, G. (2015, August 24). Knowledge and Attitudes of Registered Nurses towards Pain Management of Adult Medical Patients: A Case of Bindura Hospital. Retrieved from <http://www.hs.j.gr/medicine/knowledge-and-attitudes-of-registered-nurses-towards-pain-management-of-adult-medical-patients-a-case-of-bindura-hospital.php?aid=6882>.
- [28] Salameh, B. (2018). Nurses' knowledge regarding pain management in high acuity care units: A case study of Palestine. *International Journal of Health Sciences*, 12 (N3). Retrieved from <https://ijhs.org.sa/index.php/journal/article/view/205>
- [29] Samarkandi O. A. (2018). Knowledge and attitudes of nurses toward pain management. *Saudi journal of anaesthesia*, 12 (2), 220–226. doi: 10.4103/sja.SJA_587_17
- [30] LeRoy, Brandy C., "Knowledge of and Attitude toward Pain Control among Hospice Nurses in a Southeastern State in the US" (2012). *Nursing Theses and Capstone Projects*. 129
- [31] Al-Quliti, K. W., & Alamri, M. S. (2015). Assessment of pain. Knowledge, attitudes, and practices of health care providers in Almadinah Almunawwarah, Saudi Arabia. *Neurosciences (Riyadh, Saudi Arabia)*, 20 (2), 131–136. doi: 10.17712/nsj.2015.2.20140546
- [32] Knowledge and Attitude towards Pain Management Among Nurses in Singapore Chia, Gerk Sin et al. *Journal of Pain and Symptom Management*, Volume 56, Issue 6, e116
- [33] Rieman, M. T., & Gordon, M. (2007). Pain management competency evidenced by a survey of pediatric nurses' knowledge and attitudes. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/17907731>.
- [34] Soh, K. L. (2017). Pain Management Knowledge Among Medical Ward Nurses In Malaysia. *International Journal of GEOMATE*, 12 (30). doi: 10.21660/2017.30.2630
- [35] Hylton, A. (2018). Nurses' knowledge and attitudes regarding pain. *Nurses' Knowledge and Attitudes Regarding Pain*, 98–98. Retrieved from <https://ourarchive.otago.ac.nz/bitstream/handle/10523/9447/HyltonAprilA2018MHealSc.pdf?sequence=1&isAllowed=y>