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Knowledge, Awareness and Practice of Opioid Analgesics in Dental Management Among Undergraduates- A Questionnaire Based Study

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Abstract: Opioid analgesics are prescribed by dentists either as an adjunct or as a definitive treatment for pain management and also for some common dental diseases in which they can relieve pain when used appropriately. Nonsteroidal antiinflammatory drugs (NSAIDs) are the preferred analgesic agent by the majority of dentists when compared with opioid analgesics, because they inhibit inflammatory reactions in addition to providing analgesia. The appropriate and inappropriate use of opioid analgesics can lead to serious adverse drug events and these drugs have the potential to be misused and abused including overdose. The study was conducted among the dental undergraduates. Data collection was done by the use of online questionnaire forms that had 13 questions regarding the use of opioid analgesics in dental management. Google form was used for data collection from the surveyors.Statistical test was run using chi-square test with statistical analysis software SPSS version 23 by IBM. From the results of the study we can observe that 57% of the participants do not prescribe opioid analgesics to their patients. 62% of the participants have known that opioids can be used as a medication to relieve pain after a dental treatment. 65% of the participants consider tramadol hydrochloride to be the safest drug, 19% consider hydrocodone as the safest drug and 16% consider codeine as the safest drug among all the opioids and the results were statistically not significant. Higher interest was observed among the interns(34%) to prescribe opioids to their patients post dental treatment and the results were statistically significant. Thus it can be concluded that opioids when used in appropriate doses in the supervision of the dentist can reduce the side effects and produce excellent analgesic effect in dental management.

Keywords: knowledge, awareness, practice.

INTRODUCTION

Pain is an unpleasant sensation due to the negative impact of a situation to the body. Opioid analgesics are prescribed by dentists either as an adjunct or as a definitive treatment for pain management and also for some common dental diseases in which they can relieve pain when used appropriately(Dar-Odeh *et al.*, 2010). However, many common dental conditions are best managed by extracting the diseased tooth, restoring the carious tooth with an appropriate filling material, performing a root canal treatment etc(Cunha, 2001). Third molar extractions are a common dental procedure performed by surgeons all over the world. When drug prescription is required, opioid analgesics are not usually the first line of drugs to be prescribed, however they should be considered as an alternative in specific cases(Santini *et al.*, 2017). Nonsteroidal antiinflammatory drugs (NSAIDs) are the preferred analgesic agent by the majority of dentists when compared with opioid analgesics, because they inhibit inflammatory reactions in addition to providing analgesia(Wall *et al.*, 2007). The World Health Organisation reinforces that opioid analgesics are prescribed medication to other first-choice non-opioids, in cases where the non opioids prove to be non efficient(Organization and Others, 2012).

The appropriate and inappropriate use of opioid analgesics can lead to serious adverse drug events and these drugs have the potential to be misused and abused including overdose (Volkow *et al.*, 2011). Dental patients are more vulnerable to misuse opioids due to the leftovers which serve for non medical uses. Opioid addiction often starts with a prescription from the dentists or leftovers which are advised by the family members to self prescribe even after the relief of pain from the acquired dental condition or treatment(Wright *et al.*, 2014). Common adverse effects associated with opioids include sedation, dizziness, nausea, vomiting, pruritus,

sweating, constipation, and respiratory depression. Dentists should always use caution when prescribing pain-relieving medications and are advised to minimize inadvertent dispensation of this type of opioids to drug-seekers in dental offices (Kenna *et al.*, 1911). Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020)
Thus the aim of the study is to analyse the knowledge, attitude and practice regarding the use of opioid analgesics in dental management among the undergraduates.

MATERIALS AND METHODS

The study was conducted among the dental undergraduates. The advantage of this study being conducted online was the ease of data collection containing similar ethnicity with the involvement of both the genders. The unavailability of location specific data was the disadvantage of this study. Ethical clearance was obtained from the institutional ethical committee.
A questionnaire containing 13 questions was prepared to assess the knowledge on use of opioid analgesics in dental management. This was circulated among the dental undergraduates through mail and whatsapp as an online survey. A total of 100 undergraduate students attended the survey. Sampling bias for the study was minimised by stratification and randomization. Internal validity included a pre tested questionnaire and the external validity was the diversity of it to be applicable to dental graduates.
Data collection was done by the use of online questionnaire forms that had 13 questions regarding the use of opioid analgesics in dental management. Google form was used for data collection from the surveyors. This collected data included gender, year of study and the questions. This data was then tabulated in excel and then imported to SPSS software.
Statistical test was run using chi-square test with statistical analysis software SPSS version 23 by IBM. Its dependent variables include the use of opioid analgesics whereas its independent variables include age and gender of the participants. All of these were analysed using correlation and association.

RESULTS AND DISCUSSION

From the results of the study, we can observe that 100 students had participated in the survey, among which 43% were interns, 32% were 3rd years and 25% were 4th years (Figure 1). From the questionnaire distributed, we can observe that 57% of the participants do not prescribe opioid analgesics to their patients and 43% of the participants prescribe opioids to their patients after a dental treatment (Figure 2) and among the 43 % participants who prescribe opioids, 10% belong to 3rd year, 5% belong to final year and 28% belong to intern p value:0.015 <0.05; Statistically significant (Figure 14).
From our study, it is also found that 62% of the participants have known that opioids can be used as a medication to relieve pain after a dental treatment whereas 35% participants are not aware about the pain relieving effect of the opioids.(Figure 3). 65% of the participants are aware that opioids interact with cytochrome p450 3A4 in metabolism whereas 35% are not aware(Figure 4).
It is also observed that 81% of the participants know that opioids do not have effect in mild to moderate pain whereas 19% of the participants believe it has an analgesic effect in mild to moderate pain (Figure 5). 55% of the participants say that opioids can be prescribed in combination with acetaminophen whereas 45% of participants believe that it cannot be used in combination with acetaminophen (Figure 6).
When the participants were asked about the type of opioid analgesic that can be used safely, 65% of the participants consider tramadol hydrochloride to be the safest drug, 19% consider hydrocodone as the safest drug and 16% consider codeine as the safest drug among all the opioids (Figure 7). Among the 65% participants who prefer tramadol hydrochloride to be the safe drug, 20% belong to 3rd year, 17% belong to final year and 28% belong to intern. Chi square test; p value:0.115 >0.05; Statistically not significant (Figure 15).
It is also observed from our study that 66% of the participants are aware that opioids cause neonatal abstinence syndrome in pregnant women whereas 34% of them are not aware (Figure 8). Many of the patients when they are addicted to the opioids, fake their symptoms in order to get more opioids to satisfy their needs and this process is called doctor shopping. When the participants were questioned about this, 60 % were aware about doctor shopping whereas 40% were not aware (Figure 9). When asked about the nerve transmission during pain, 65% of the participants are aware that opioids block substance P preventing the transmission of pain signals across the nerve fibres and 35% were not aware of this (Figure 10). 56% of the respondents say that opioids affect the c fibres particularly during neurotransmission of pain signals whereas 44% say that they affect A delta fibres during pain (Figure 11).

When the respondents were asked about the addictive effect of opioids, 80% of the respondents were aware that opioid analgesics could cause addiction when abused and 20% were not aware of this fact (Figure 12). Participants were asked about their willingness to prescribe opioid analgesics to patients in which it was observed that 68% of them were willing to prescribe opioids to their patients after a dental treatment for a better analgesic effect and patient satisfaction whereas 32% do not will to prescribe these drugs fearing of the consequences of misuse (Figure 13). Among the 100 participants, Higher interest was observed among the interns(34%) to prescribe opioids to their patients post dental treatment. Chi square test; p value:0.045 <0.05; Statistically significant (Figure 16).

A study conducted by lino et al shows that the most commonly used opioid was codeine in combination with paracetamol and one in 1000 patients were prescribed opioids which were positively associated with dentists and inversely associated with socio economic status of the patients(Lino *et al*., 2019). The prescription of opioid analgesics was 50.3% for NTDC and 14.8% for non-NTDC visits. Prescription of opioids was highest among patients aged 19-33 years (56.8%), self-paying (57.1%), and nonHispanic Whites (53.2%). The probability of being prescribed hydrocodone was highest among uninsured patients (68.7%) and for oxycodone, it was highest among private insurance patients (33.6%) and the results were statistically not significant (Okunseri *et al.*, 2015). A study conducted by nalliah et al on the association of opioid analgesics on pain and satisfaction after a dental extraction shows that patients who used opioids after tooth extraction reported significantly higher levels of pain compared with nonusers, but no difference in satisfaction was observed(Nalliah *et al.*, 2020).

It is recommended that after a dental procedure, patients should be prescribed a mild dose of analgesic after a dental treatment and if the pain does not subside, analgesics in combination with acetaminophen is recommended and still on inadequate relief of pain leading to moderate to severe pain, an opioid analgesic can be prescribed in mild dose in combination with acetaminophen. Research is needed in a number of areas related to the management of acute postoperative pain in the dental setting. Gaps in current pharmacologic knowledge include the efficacy of prescribing analgesics at fixed intervals versus as needed; demographic, behavioral, and genetic factors that potentially predict pain relief efficacy, adverse outcomes, and abuse; the utility of NSAID/APAP combinations in limiting the need for opioid analgesics. It is also necessary to better understand the patterns for pain management and analgesic use (both opioid and non-opioid) among general dentists and dental specialists, their perceptions of risk and safety of opioid analgesics, and their awareness about the increasing problem of prescription drug misuse and abuse; and guide these practitioners in optimal and safe prescribing of analgesics for acute pain in all patients.Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al*., 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al*., 2020; Mathew *et al*., 2020; R *et al.*, 2020; Samuel, 2021)

CONCLUSION

From the limits of the study, it is observed interns were more aware about the knowledge and practice of opioid analgesics in dental management and are willing to prescribe opioids in appropriate doses to their patients as an analgesic in pain management. Opioid analgesics are important pharmacologic agents prescribed by dentists in managing common dental conditions. These agents are generally adjunctive in nature, and there is serious potential for abuse of these agents through unnecessary prescribing practices. Therefore these drugs should be prescribed in appropriate doses under the supervision of the dentist to gain an excellent analgesic effect.

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CONFLICT OF INTEREST

The authors would like to declare that there is no conflict of interests.

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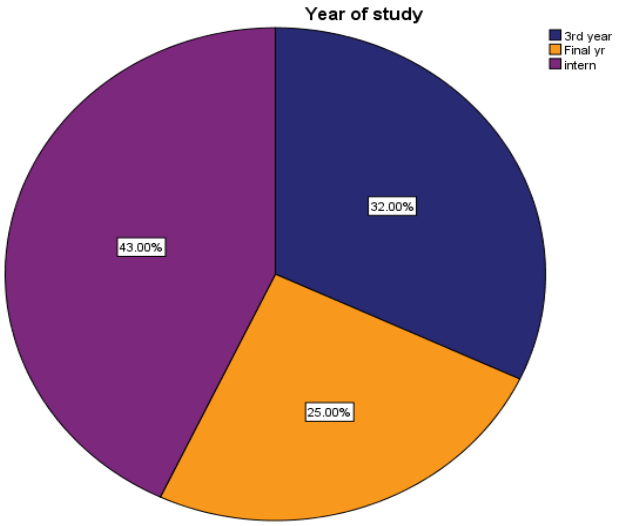

Fig.1: Pie chart shows study population. Among the 100 participants 43% were interns, 32% were 3rd years and 25% were 4th years.

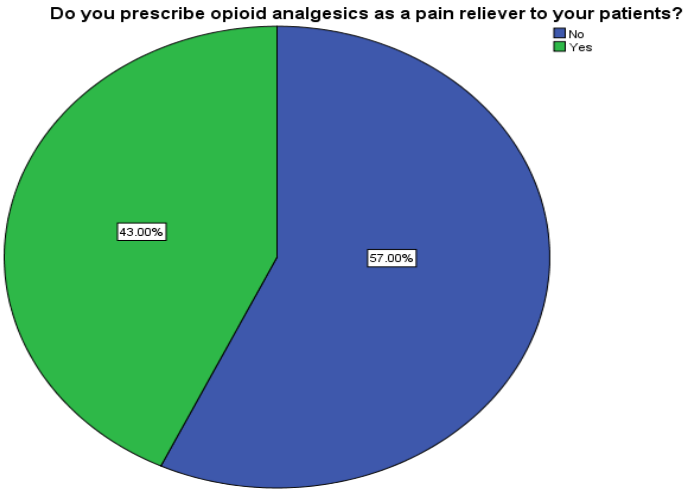

Fig.2: Pie chart represents prescription of opioid analgesics by participants. 57% of the participants do not prescribe opioid analgesics as a pain reliever to their patients.

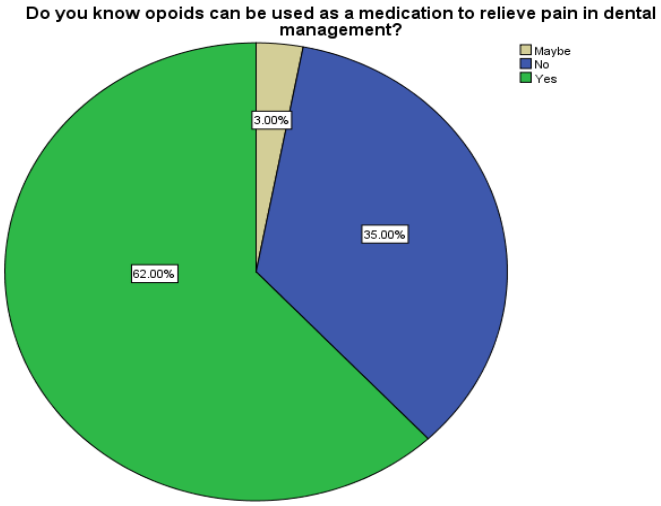

Fig.3: Pie chart represents knowledge of opioids as a medication for pain relief. Among 100 participants, 62% of the participants have known that opioids are used for pain relief in dental management.

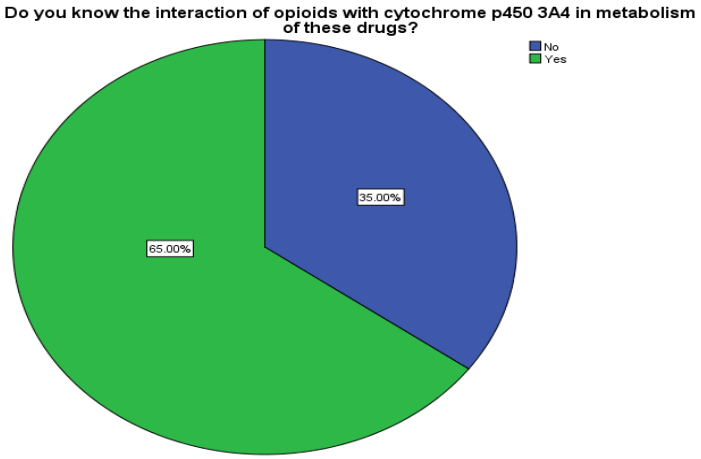

Fig.4: Pie chart representing knowledge of opioids in the interaction with cytochrome p450 3A4. 65% of the participants have known that opioids interact with cytochrome p450 3A4 in metabolism.

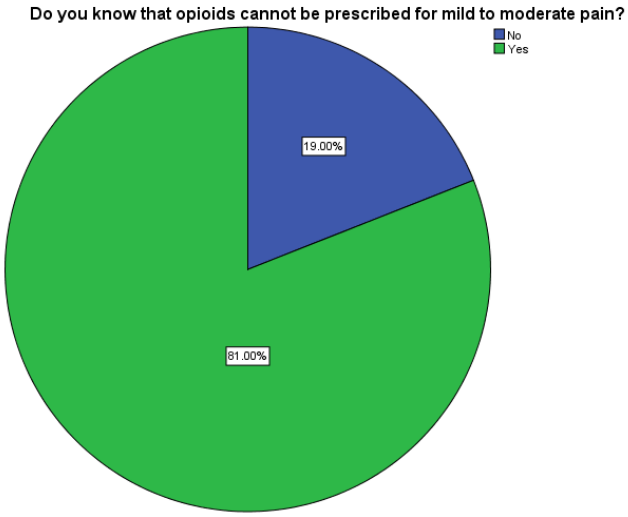

Fig.5: Pie chart showing knowledge of prescription of opioids. 81% of the participants have known that opioids cannot be prescribed for mild to moderate pain.

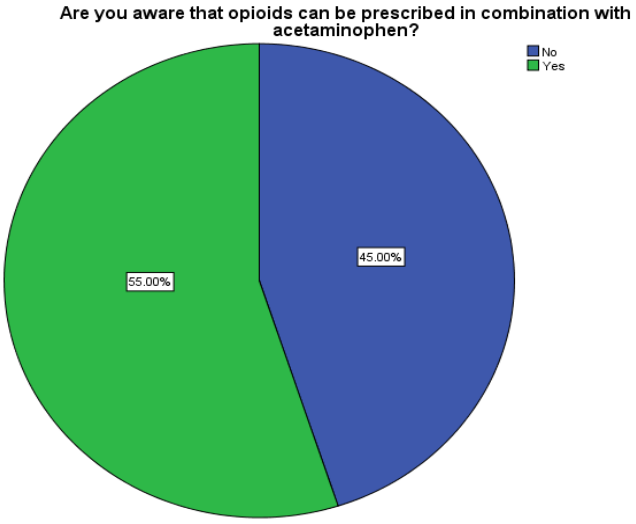

Fig.6: Pie chart represents the awareness of the prescription of opioids with acetaminophen. 55% of the study population are aware that opioids are prescribed in combination with acetaminophen.

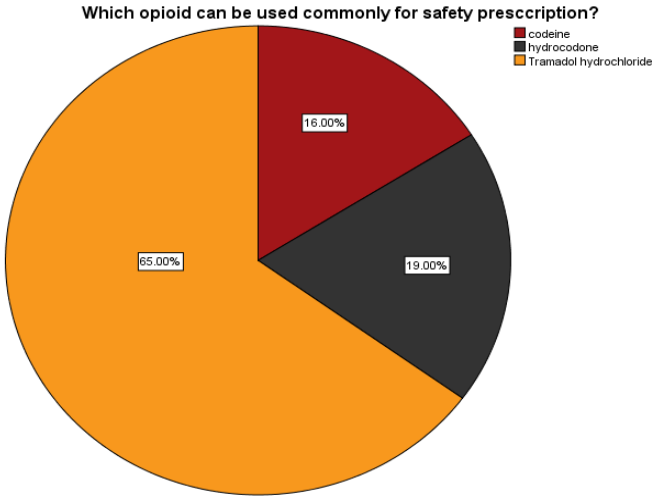

Fig.7: Pie chart representing the drug commonly used for safety prescription. 65% of the participants say that tramadol hydrochloride can be used for safety prescription.

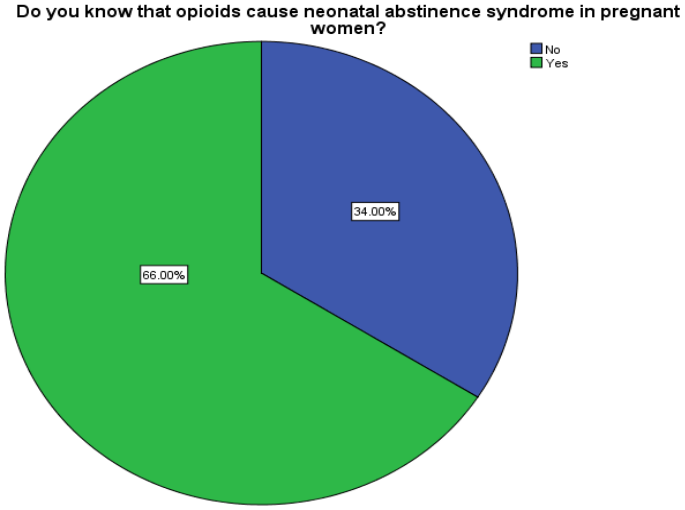

Fig.8: Pie chart representing knowledge of opioids in causing neonatal abstinence syndrome in pregnant women. 66% of the participants have known that opioids cause neonatal abstinence syndrome in pregnant women.

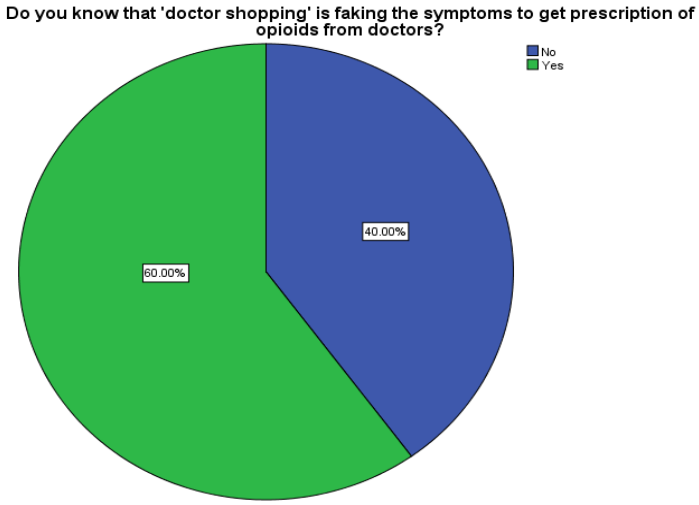

Fig.9: Pie chart representing the knowledge of doctor shopping. 60% of the participants have known that doctor shopping is faking the symptoms to get prescription opioids from doctors.

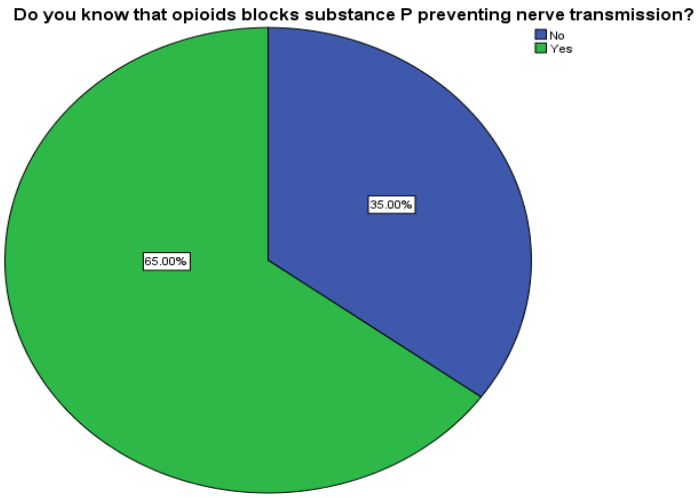

Fig.10: Pie chart representing the knowledge of opioids in blocking substance P during nerve transmission. 65% of the participants say that opioids block substance P preventing nerve transmission.

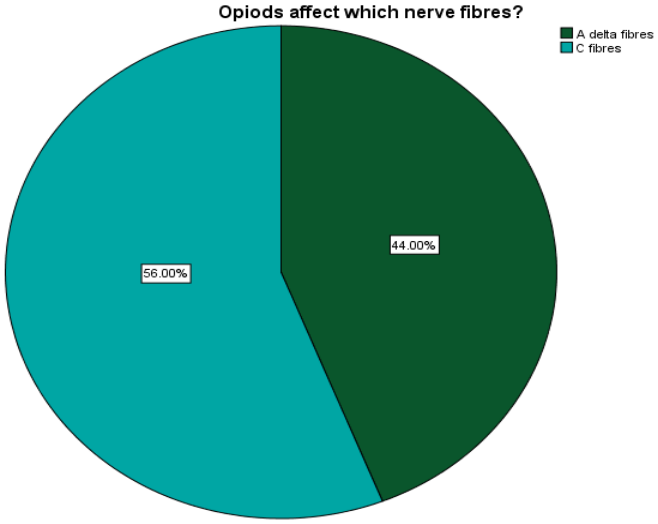

Fig.11: Pie chart representing knowledge of opioids in affecting the type of nerve fibres. 56% of the participants say that opioids affect C fibres.

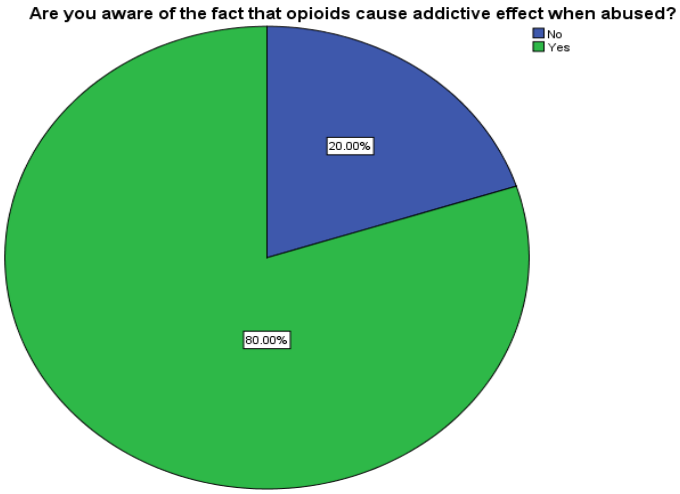

Fig.12: Pie chart representing the knowledge of the addictive effect of opioids. 80% of the participants say that opioids have an addictive effect when abused.

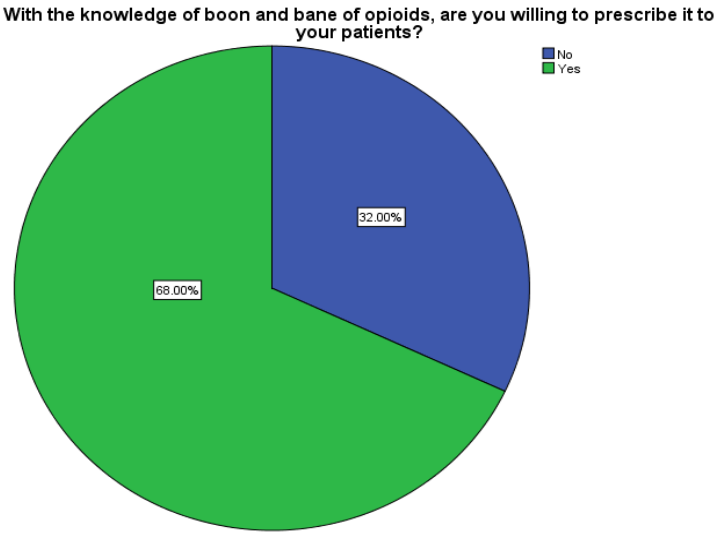

Fig.13: Pie chart representing the willingness to prescribe opioids to patients. 68% of the participants are willing to prescribe opioids to their patients.

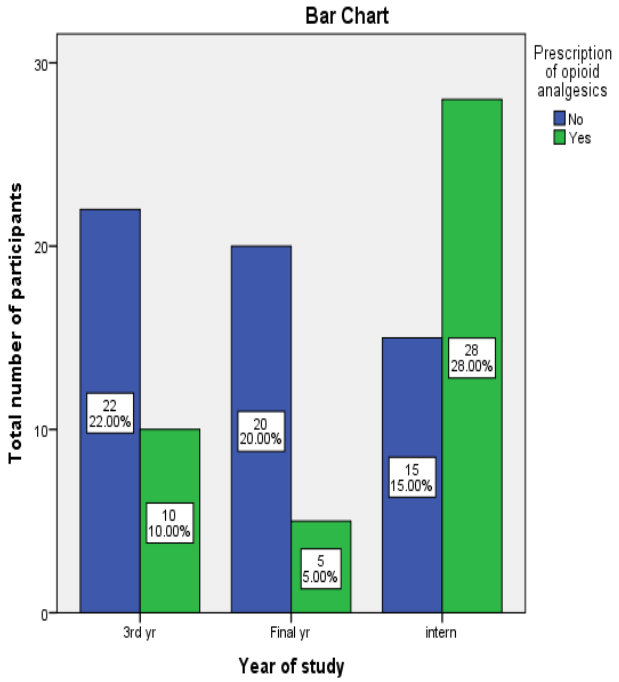

Fig.14: Bar graph representing association of number of participants prescribing opioids to their patients based on year of study. X axis represents year of study and Y axis represents total number of patients. Among the 100 participants, higher prevalence was seen among the interns(28%) in prescribing opioids to their patients (Chi square test; p value:0.015 <0.05; Statistically significant)

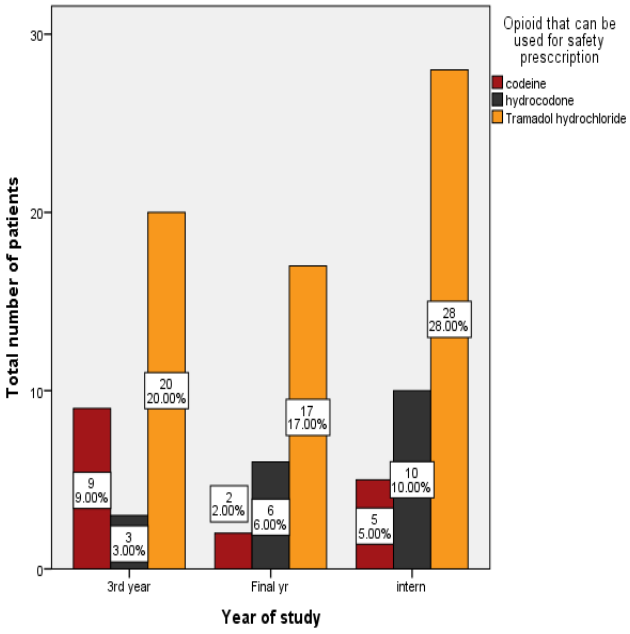

Fig.15: Bar graph representing association of type of opioid that can be used for safety prescription based on year of study. Majority of the participants consider tramadol hydrochloride (28%)to be chosen as a drug for safety prescription. (Chi square test; p value:0.115 >0.05; Statistically not significant)

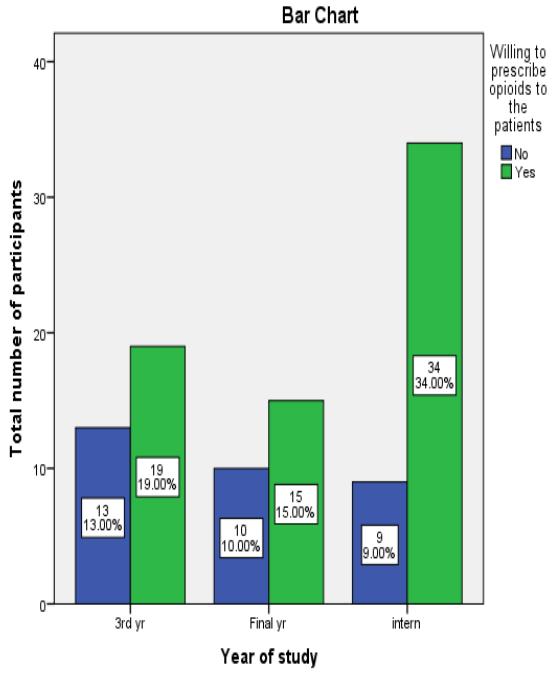

Fig.16: Bar graph representing association of the willingness to prescribe opioids to patients based on year of study. X axis represents year of study and Y axis represents total number of patients. Among the 100 participants, the majority of the interns(34%) are willing to prescribe opioids to their patients. (Chi square test; p value:0.045 <0.05; Statistically significant)