Compendium of Oral Science Vol. 10 (1) 2023 pg. 89-100
https://doi.org/10.24191/cos.v10i1.21625

Compendium of Oral Science Volume 10(1)/2023
Original Article

Self-Medication Practice for Dental Pain: Expectations and Rationality

Zaty Ainaa Mohamed[1], Nur Farhaanah Azman[2], Mahyunah Masud[3], Mohd Aizat Abdul Rahim[4], Mohamed Ibrahim Abu Hassan[4,*]

[1]*Pasir Gudang UTC Dental Clinic, Lot 1-04 Kompleks Pusat Bandar Pasir Gudang 81700 Pasir Gudang, Johor, Ministry of Health, Malaysia*

[2] *Kemasik Dental Clinic, 24000 Chukai, Terengganu, Ministry of Health, Malaysia*

[3]*Faculty of Dentistry, MAHSA University Jln SP2, Bandar Saujana Putra, 42610 Jenjarom, Selangor, Malaysia*

[4]*Faculty of Dentistry, Universiti Teknologi MARA Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia*

Corresponding Author:
mibrahim@uitm.edu.my
Tel: +60361266465

Received: September 13, 2022
Reviewed: October 01, 2022
Accepted for publication: October 30, 2022

ABSTRACT

Self-medication (SM) is the use of medicines by people who take drugs without the advice of doctors. **Purpose:** *To determine the prevalence of SM for dental pain, to compare the contributing factors, perception, and awareness regarding the practice among medical, dental and, pharmacy students.* **Methods:** *This observational study was conducted among 573 year1 and year5 students undergoing the teaching of pharmacology. The validated questionnaires were distributed during the beginning of the years. Data were analyzed using SPSS version 23.* **Results:** *The experience of dental pain by the students was 69-87%. The prevalence of SM among year1 and year5 were 30% and 49% (medical), 37% and 61% (dental), 46% and 57% (pharmacy) respectively with pharmacy year1 scoring highest at 46% and dental year5 at 61%. Both years medicated with analgesic at 17-33% while 35-70% opted for saltwater, ice packs, and others. The medical and pharmacy students*

perceived that they do not have a good ability to diagnose symptoms of dental pain. The majority was aware of drug interactions and expiratory dates. **Conclusion:** *As expected, the year5 self-medicated more than the year1, made easy by the gain in knowledge and accessibility to medicines. Their perception and awareness rationalize them as future prescribers for medication.*

Keywords*: self-medication, students, dental pain, expectations, rationality.*

INTRODUCTION

Self-care is what people do to establish and maintain health, prevent, and deal with illness. It is a broad concept encompassing hygiene, nutrition, lifestyle, environmental and socioeconomic factors, and health (WHO, 1998). SM is the use of medicines by people who did not take professional advice or obtain and take drugs without the advice of doctors or the use of medication on his initiative instead of consulting a medical practitioner (Merriam-Webster Dic, 2021). Throughout the world, people try to prescribe different types of drugs for their health, friends, and relatives. It encompasses the use of medicinal products often called "over-the-counter" (OTC) drugs that are available without a doctor's prescription or traditional medicines to treat self-recognized symptoms including odontalgia (Sankdia et al, 2017).

Odontalgia is defined as a pain in a tooth or called toothache (Rao et al, 2015). In recent years, there has been an increasing trend in SM with OTC drugs available in pharmacy and retail outlets Stoking and Gubili (2004). SM patterns varied among the different populations and were influenced by various features such as age, gender, income and expenditure, self-care orientation, educational level, medical knowledge, satisfaction, and non-serious illness (Kalra, 2015). SM practice may benefit some individuals in which it decreases the frequency of physician visits and reduces costs (Helal et al, 2017). However, if not practiced responsibly, it may lead to serious problems. A major drawback of SM is the lack of clinical evaluation of the condition by medical professionals which gives rise to incorrect self-diagnosis, delay in appropriate effective treatment, adverse drug reaction, excessive dosage, and risk of drug dependence (Furreh et al, 2016).

In the dental profession, there are several factors why patients practice SM including the cost of dental treatment, fear of treatments and instruments, ignorance, or lack of knowledge about the role of the dentist in the management of oral problems, and most important is not understanding about the problem, whether it is the dental origin or not (Shival et al, 2015). Studies have shown that SM practice among medical, dental, and pharmacy (MDP) university students seems common. MDP students are future prescribers of drugs and so it is important to find out how rational their drug use is (Ehigiator et al, 2013). They differ from the general population because they are exposed to knowledge about diseases and drugs. Due to existing knowledge of common medicines prescribed and the knowledge of pharmacology taught, there are high chances the students may indulge in SM practices. A common drug used in SM is analgesic (Golar, 2011) with paracetamol being most common (Abay & Amelo, 2010). In addition, SM has been known to be globally practiced among the population, but little is known on this practice among young adults in Malaysia especially so among the MDP students, and data on the prevalence of SM among them is scarce. This study was conducted to determine the prevalence of SM for dental pain among the first and final year of MDP students and to compare the contributing factors, perception, and awareness regarding the practice. It is hypothesized that there are differences in the prevalence, perception, and awareness in the practice among the three disciplines. The results could determine their expectation and rationalize the practice.

MATERIALS AND METHODS

This observational and descriptive study was conducted among 573 Malaysian undergraduates from the three disciplines undergoing the teaching in pharmacology and later in the years, the teaching and practice on medication and prescription. The study was approved by the Research Ethics Committee of Universiti Teknologi MARA (100-IRMI (5/1/6) - REC/204/18). The questionnaires were designed in English being the language of instruction in the university by reviewing the available research literature. Some of the research questions were incorporated from the research instrument developed by (Mehta and Sharma, 2015). The validation process was conducted by presenting the questionnaire to a panel of experts including medical, dental doctors, and pharmacists. Few questions were added and modified after obtaining the suggestions from the experts to have a greater degree of specificity and validity. Validated self-administered paper-based questionnaires were distributed during the beginning of the years. The questionnaires were distributed together with informed consent and an explanation to the students on the study purpose and impact. The questionnaires were divided into five sections consisting of demographic information, eight (8) questions on the practice, fourteen questions (Jain et al, 2016) on the contributing factors, eleven (11) on perceptions, and nine (9) on awareness of SM. Data were analyzed using SPSS version 23 and one-way ANOVA. Results with a p-value of less than 0.05 were considered statistically significant.

RESULTS

A total of 573 students responded to the questionnaires giving a response rate of more than 99%. Out of 573 participants, 288 and 285 were year1 and year5 students, respectively. Among year1 students, 71 were medical, 78 were dental and 137 were pharmacy. Meanwhile, among year5 students, 110 were medical, 45 were dental and 130 were pharmacy. All the participants' age was in the range of 21-27 years old. 85% (486) were female and the remaining 15% (87) were male.

Students perceived that the dental pain originates from the tooth (35%), gum (30%), and both (35%) (Table 1). For year1 and year5 students, the experience of dental pain was 86% and 84% for medical, both 69% for dental, 87% and 85% for pharmacy respectively (Table 2). The findings were statistically significant ($p<0.05$). The prevalence of SM practice for year1 and year5 students were 30% and 49% (medical), 37% and 61% (dental), 46% and 57% (pharmacy) respectively. Year1 pharmacy students carried the highest percentage in practicing self-medication at 46% (n=55), while dental students were the highest for year5 61% (n=19) (Fig.1 & 2). However, the findings were not statistically significant.

Table 1: Origin of dental pain

Origin of pain	Number of students (n)	Percentage (%)
Tooth	164	35
Gum	142	30
Both tooth and gum	164	35

Four types of common medication were asked. Year1 pharmacy students (33%) have the highest percentage in medicating with analgesic compared to medical (17%) and dental (24%). Year1 of all disciplines (52-70%) medicated themselves with salts, hot water, and ice pack. Whereas year5 medical students (13%) have the highest percentage in prescribing themselves an antibiotic. There was no

information on how the antibiotics were obtained. Between 0-12% of all students took herbal instead for dental pain (Fig. 3, 4).

Table 2: Dental pain experienced pain among year1 and year5 MDP students.

	Medical students		Dental students		Pharmacy students		
	yr1 %(n)	yr5 %(n)	yr1 %(n)	yr5 %(n)	yr 1 %(n)	yr 5%(n)	*p*-values <0.05
Dental pain experienced	86(63)	84(92)	69(54)	69(31)	87(119)	85(111)	*yr1=0.003 *yr5=0.04

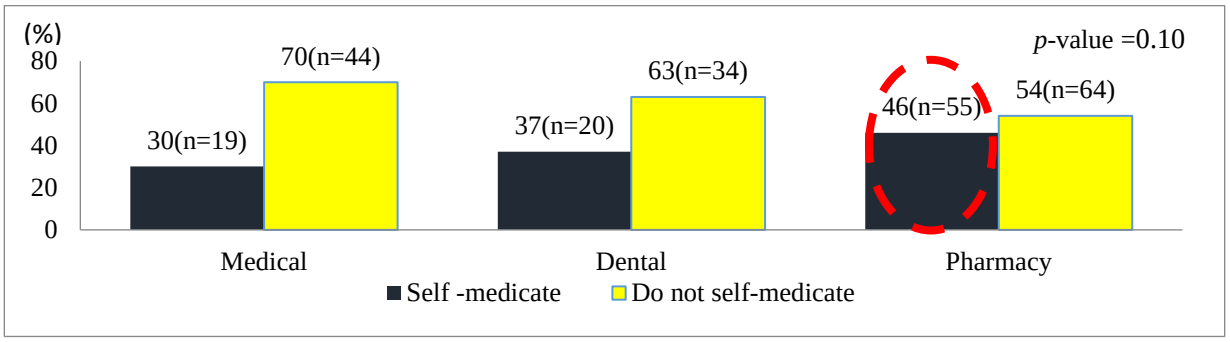

Fig.1: Prevalence of SM practice for dental pain among year1 MDP students

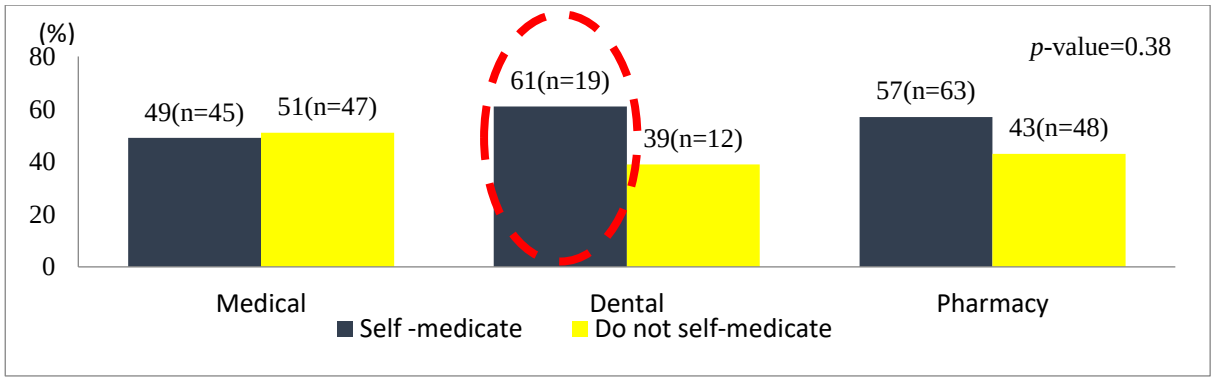

Fig. 2: Prevalence of SM practice for dental pain among year5 MDP students

The major factors that influenced the year1 and year5 for SM were time and cost-saving (Table 3). They generally believed that there was no need to visit a doctor for minor pain as reflected by 70% of pharmacy year5 students. This study reported dental year1 surprisingly being the highest in fear for dental treatment (63%) and dental instruments (55%) more than their medical colleagues. The only statistically significant factor contributing to self-medication was about getting the information on self-medication from the internet and advertisement (p=0.003).

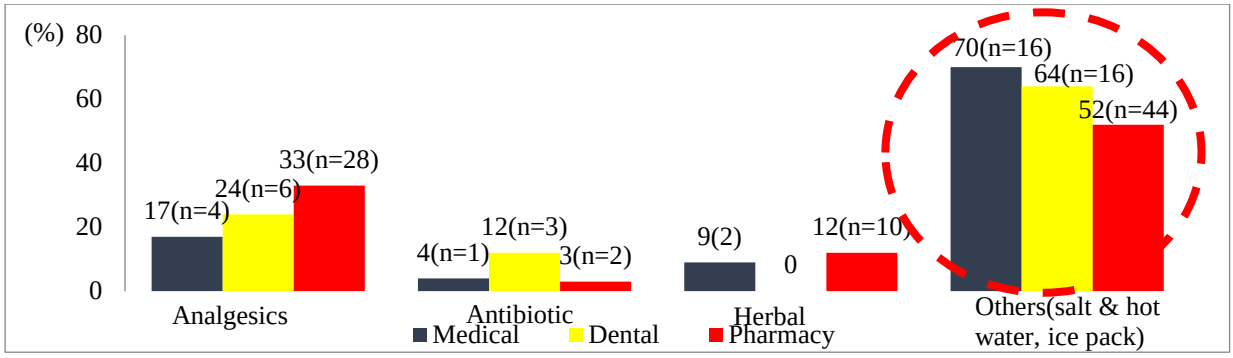

Fig. 3: Types of medication used for dental pain among year1 MDP students

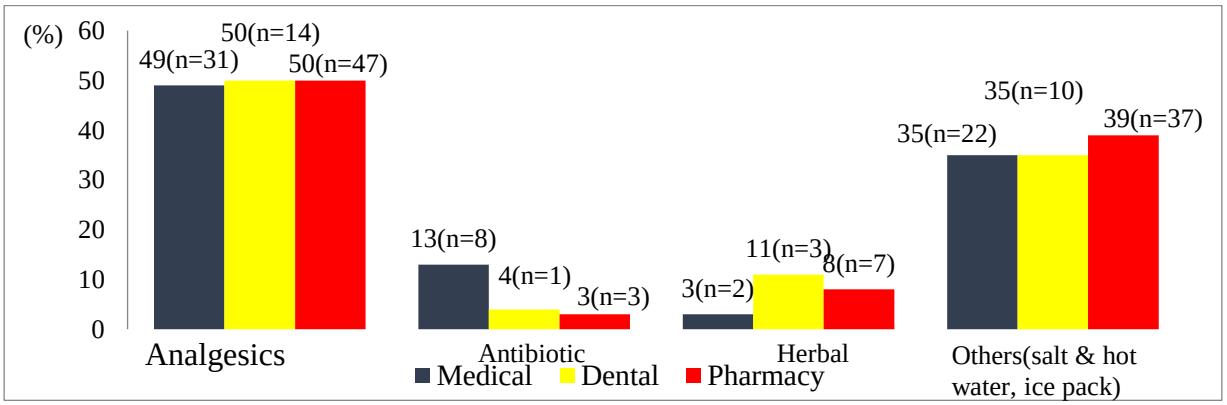

Fig. 4: Types of medication used for dental pain among year5 MDP students

Year1 pharmacy students (38%) perceived that SM practice is acceptable for them as compared to dental (22%) and medical (16%) students (p = 0.02**).** However, a higher 41% (dental) and 62% (medical) seemed unsure and neutral on this perception. On the ability to diagnose symptoms of dental pain, medical year5 (46%) and pharmacy (48%) students perceived that they do not have good ability compared to dental of only 24%. As expected, the year1 seemed in agreement with their ability shown by the range of 7-11% only. Many students perceived neutrality for this ability as shown by the higher range of between 37-49% (year5 dental students). Between 47-62% of year1 students did not have a good ability to treat dental pain which can be expected, however, 50% of year5 dental students reported neutrality seemed to be a concern. Up to almost 50% of year1 medical students were unsure about the requirement to complete antibiotics even after symptoms have subsided as compared to dental (22%) and pharmacy (28%) students. However, year5 students of all disciplines (up to 90%) seemed to be sure of this requirement and to get medication from legal healthcare practitioners. It was good to know from this study that both years of MDP were aware of the drug expiry date, consequence of over-dosage, and drug interaction. Fortunately, most of them have never encountered adverse reactions because of SM (Table 4). These findings were statistically significant for the final years in the three disciplines.

Table 3: Factors contributing to SM practice for dental pain among year1 and year5 of MDP students

	Medical students		**Dental students**		**Pharmacy students**		
Factors contributing to SM	yr1 %(n)	yr5 %(n)	yr1 %(n)	yr5 %(n)	yr 1 %(n)	yr5 %(n)	*p*-value (<0.05)
No need to visit a doctor for minor pain							
Disagree	22(16)	18(20)	12(9)	24(11)	22(30)	8(11)	yr1 =0.33 yr5 = 0.00
Neutral	41(30)	29(32)	43(34)	42(20)	30(41)	22(26)	
Agree	37(27)	53(58)	45(35)	33(15)	48(66)	70(91)	
Fear of dental treatment							
Disagree	34(25)	39(43)	22(17)	20(9)	31(42)	32(41)	yr1= 0.05
Neutral	23(17)	19(21)	15(12)	24(11)	20(28)	18(24)	yr5 =0.09
Agree	43(31)	42(46)	63(49)	56(25)	49(67)	50(65)	
Fear of dental instruments							
Disagree	37(27)	38(42)	21(16)	24(11)	29(40)	34(44)	yr1 = 0.07
Neutral	23(17)	19(21)	24(19)	27(12)	19(26)	19(25)	yr5 = 0.44
Agree	40(29)	43(47)	55(43)	49(22)	52(71)	47(60)	
Time-saving							
Disagree	11(8)	6(7)	15(19)	9(4)	6(8)	2(3)	yr1=0.28
Neutral	21(15)	12(13)	11(14)	22(19)	25(35)	14(18)	yr5= 0.06
Agree	68(50)	82(86)	52(67)	69(31)	69(94)	84(109)	
Cost-saving							
Disagree	4(3)	10(11)	15(12)	9(4)	7(9)	6(8)	yr1=0.52
Neutral	26(19)	12(13)	15(12)	24(11)	26(36)	13(17)	yr5= 0.27
Agree	70(51)	78(86)	70(54)	67(30)	67(92)	81(106)	
Information about the medicine from the internet and advertisement							
Disagree	26(19)	24(26)	15(12)	22(10)	26(35)	29(37)	yr1=0.003
Neutral	38(28)	30(33)	22(17)	31(14)	36(50)	37(48)	yr5 =0.18
Agree	36(26)	46(51)	63(49)	47(21)	38(52)	24(44)	

Table 4: Perception and awareness of SM practice for dental pain among year1 and year5 MDP students

	Medical students		Dental students		Pharmacy students		
Perceptions	yr1%(n)	yr5%(n)	yr1%(n)	yr5% (n)	yr1%(n)	yr5%(n)	*p*-value<0.05
SM is acceptable for MDP students							
Disagree	22(16)	35(38)	37(29)	20(9)	25(34)	27(35)	*yr1=0.02
Neutral	62(45)	36(40)	41(32)	47(21)	37(51)	36(47)	yr5 =0.23
Agree	16(12)	29(32)	22(17)	33915)	38(52)	37(48)	
I have a good ability to diagnose symptoms							
Disagree	55(40)	46(51)	50(39)	24(11)	42(58)	48(62)	yr1=0.21
Neutral	38(28)	37(41)	40(31)	49(22)	47(64)	41(56)	*yr5=0.005
Agree	7(5)	17(18)	10(8)	27(12)	11(15)	10(13)	
I have a good ability to treat the symptoms							
Disagree	62(45)	43(47)	51(40)	22(10)	47(64)	28(36)	yr1=0.15
Neutral	30(22)	30(33)	35(27)	51(23)	41(56)	50(65)	yr5=0.30
Agree	8(6)	27(30)	14(11)	27(12)	12(17)	22(29)	
It is essential to get medication from a legal healthcare practitioner							
Disagree	3(3)	3(3)	5(4)	2(1)	3(4)	2(3)	yr1=0.94
Neutral	12(9)	11(12)	5(4)	5(2)	12(16)	8(10)	yr5=0.54
Agree	85(62)	86(95)	90(70)	93(42)	85(117)	90(117)	
The course of antibiotics should be completed after the symptom have subsided							
Disagree	1(1)	5(5)	1(1)	2(1)	4(5)	3(4)	*yr1=0.009
Neutral	48(35)	7(8)	22(11)	2(1)	28(38)	7(9)	yr5=0.45
Agree	51(37)	88(97)	77(60)	96(43)	68(94)	90(117)	
I am aware about the expiry date							
Disagree	6(4)	8(9)	1(1)	2(1)	3(4)	1(1)	yr1=0.19
Neutral	16(12)	10(11)	12(9)	9(4)	12(16)	5(6	*yr5= 0.002
Agree	78(57)	82(90)	87(68)	89(40)	85(117)	94(123)	
I am aware of the consequence of overdosage							
Disagree	4(3)	5(5)	1(1)	2(1)	3(4)	1(1)	yr1=0.32
Neutral	8(6)	10(11)	8(6)	9(4)	14(19)	3(4)	*yr5=0.02
Agree	88(64)	85(94)	91(71)	89(40)	83(114)	96(125)	
I am aware of drug interaction							
Disagree	5(4)	12(13)	8(6)	0(0)	4(6)	5(7)	yr1=0.24
Neutral	25(18)	31(34)	30(24)	27(12)	42(57)	24(31)	*yr5=0.001
Agree	70(51)	57(63)	62(48)	73(33)	54(74	71(92)	
I have encountered adverse reactions because of SM							
Disagree	48(35)	55(61)	45(35)	49(22)	36(49)	52(67)	yr1=0.35
Neutral	34(25)	20(22)	33(26)	31(14)	43(59)	20(26)	
Agree	18(13)	25(27)	22(17)	20(9)	21(29)	28(37)	yr5= 0.77

*Statistically significant

DISCUSSION

The tooth was one of the most common origins of dental pain followed by gum for which people self-medicate. Studies were done by Jain *et al.* (2016) and Agbor & Azodo *(*2011) also have shown that most frequently self-medicated oral health problem was toothache opposing to study by Kalyan *et al.* (2013) which mentioned that ulcer was the most common. Based on the prevalence of SM among year1 students, pharmacy has the highest percentage compared to others (Gutema *et. al*., 2011). They found that pharmacy students self-medicated more frequently than medical and paramedical students. This may be due to their better exposure to pharmacology in their curriculum. Therefore, they tended to be more confident to use medication without prescription but were more cautious about the safety of SM (Alam, 2015). For year5 students, the majority of the three disciplines were self-medicated, with dental students had the highest percentage. It might be due to greater knowledge regarding symptoms related to dental pain and how to treat the pain based on experience treating their patients. In comparison between year1 and year5 students, (Abay and Amelo, 2010)fou nd that there was a relation between SM and year of study. As the students' year of study increase, their level of knowledge and understanding about drugs would increase which lead them to be more confident in choosing medicines and increased the tendency to self-medicate. However, studies by da Silva and Soares (2012) and Sontakke *et. al*. (2011) revealed no difference in the prevalence of SM between junior and senior students.

In the study by Tesfamariam and team (2019), 93.7% of 609 customers of 20 pharmaceutical outlets, self-medicated on OTC drugs of which 81.8% were at risky practice. The study also concluded that students below overage score in knowledge were more likely to be engaged in this risky practice. This is an alarming fact because as future healthcare professionals, they should aspire and educate patients to avoid SM since it may affect health. Studies conducted by Sihavong *et. al.* (2006) mentioned that SM is an unhealthy option that can cause incorrect self-diagnosis, treatment failure, drug resistance, and drug toxicity. From this finding, it was shown that year1 students had lesser courage to prescribe themselves synthetic drugs. Lack of knowledge on drugs' mechanism of action and their effect might be the reason they choose a relatively safer way to treat their pain and in our study the use of saltwater, and ice packs. This contradicts with the year5 because they have broader knowledge related to the drug which they learned throughout the syllabus. Thus, they have a higher tendency to self-medicate with synthetic drugs (Niwandinda et al, 2020). Fortunately, the prevalence in our study was not that alarming. In concordance with studies done by Jain *et. al.* (2018) and Yadav *et. al.* (2016), the most common synthetic drug used by them was analgesic (Masud et al, 2020), specifically paracetamol. Its frequent usage might be due to its availability in the market. It was also found that there were still a few who prescribed themselves antibiotics for SM to treat their dental pain which was inappropriate behavior to practice. This was also reported in our study. This implied that these students did not take antibiotics resistance as a serious issue even it has been taught in the curriculum. In a study by Zaidi *et. al.* (2019), only 38.8% of the students were aware of antibiotic resistance and concluded that awareness campaigns are needed to promote students' use of antibiotics in young generations particularly among pre-professional health sciences students.

Time limitation and desire for quick relief could be the factors for preference to self-medicate instead of seeing doctors for their minor pain. The long waiting queue was unfavorable for them to get the treatment. Other reasons that lead students to self-medicate was its lesser costs than getting expensive consultation and medications from doctors. This is supported by many studies which stated that they self-medicated to avoid unnecessary expenditure on doctor's fees (Badigeret 2012). Supposedly, it should not be an issue for our students as a dental clinic is available nearby and all

dental care services are cheaper than private clinics. Our study revealed that year1 pharmacy students mostly accepted SM practice. This was in parallel with our findings that they practiced SM more than other year1 students and appeared that their perception led to their action.

Year5 medical and pharmacy students were less confident in diagnosing symptoms of dental pain since they might not have enough exposure specifically regarding dental pain compared to dental students. In contrast, Year 5 dental students seemed to have greater confidence to diagnose dental-related symptoms as they have spent throughout their whole academic years learning dental-related problems. Based on our finding regarding antibiotic course completion, final year students have a better understanding of why the antibiotic course should be completed as what they have learned in the pharmacology module. Our study discovered that although the majority of both year1 and year5 students agreed medication should be obtained from a legal healthcare practitioner, it contradicted with their practice in SM. The current study reported that most of year1 and year5 students were aware of SM practice for dental pain in terms of the drug expiry date, consequences of over-dosage, and drug interactions and resistance. The study done in 2019 Haque et al (2019) on SM practice among university students on antibiotics concluded that no adverse drug reaction was obtained from local retail pharmacies. 89% believed that SM of antibiotics was good/acceptable practice even though having the understanding that it was unwise. A review paper by Larissa Grigoryan *et. al.* (2019) concluded that non-prescription antibiotic use was seemingly prevalent and is a public health problem in the United State. Scarce evidence was the limitation of the study and an increased understanding of risk factors and pathways that were amenable to intervention is essential to decrease this unsafe practice.

Mohamed Al Essa *et. al*. in 2019, concluded that the occurrence of SM was distressingly high among MDP students. It is expected that students should be educated about the side effects, the drawback of irresponsible SM, and rationalize the use of it (AlEssa et al, 2019). Community pharmacists seemed to have been providing a certain level of oral health services and play an important role in oral health. There is the need for an interprofessional partnership between MDP professional bodies to develop, evaluate resources, guidelines, healthcare curricula, and services for the delivery of oral health care within the communities (Blebil et al, 2020).

Limitation of Study

The time and involvement of just one institution limit the scope of our study. Gender bias might have affected the results as 85% of the respondents were female.

CONCLUSION

This study demonstrated that there was a difference in prevalence in SM practice for dental pain among year1 and year5 MDP students. As expected, year5 has a higher prevalence for all three disciplines compared to year1 which were facilitated by their knowledge gained and easy availability or accessibility of the medicines. The students self-medicate for dental pain to save time and cost. In general, the year5 students' awareness and perception seemed appropriate and commendable as they are going to be future healthcare professionals. As the practice of SM is inappropriate, there is a need to sensitize MDP students about the potentially serious effects of SM.

HIGHLIGHTS

Clinical significance, implications, key findings, public health relevance, and recommendation: SM for dental pain is most prevalent among pharmacy and dental students, and dental students are perceived to have a better ability to diagnose symptoms compared to the pharmacy and medical students. Students were aware of SM on antibiotics intake and drug resistance. A review of educational programs is needed such as topics on SM and judicious use of medicines in the clinical pharmacology module. Legislation and implementation of laws restricting access to drugs including antibiotics are required under the Registration of Pharmacist Act 1951 (revised 1989) and Sale of Drugs Act 1952 (revised 1989).

ACKNOWLEDGEMENT

We would like to express our warm gratitude to the Faculty of Dentistry, Universiti Teknologi MARA for allowing us to do this research, Dr. Farha from the Center of Periodontology, and Madam Ezlina Usir from the Faculty of Pharmacy for sharing their knowledge, experience, and guiding us throughout the research. Finally, we would like to extend our deepest appreciation to all the students without whose active participation, this study would not have been possible. This project is fully funded by Universiti Teknologi MARA, Malaysia under DUC grant (600-UiTMSEL (P1.5/4) (071/2018) with an ethical approval Reference Number: 100-IRMI (5/1/6) -REC/204/18. The paper was presented at the oral presentation during the 4th International Association of Dental Research 2019 at Brisbane Australia on 30 November 2019.

REFERENCES

Abay, SM, & Amelo, W. (2010). Assessment of Self-Medication Practices Among Medical, Pharmacy, Health Science Students in Gondar University, Ethiopia. J Young Pharm;2(3):306-310.

Agbor, MA, & Azodo, CC. (2011). Self-Medication for Oral Health Problems in Cameroon. Int Dent J;61(4):204-209.

Alam, N, Saffoon, N, & Uddin, R. (2015). Self-Medication Among Medical and Pharmacy Students in Bangladesh. BMC Res Notes; 8:763.

AlEssa, M, Alshehri, A, Alzahrani, M, Bustami, R, Adnan, S, & Alkeraidees A. (2019). Practices, awareness and attitudes toward self-medication of analgesics among health sciences students in Riyadh, Saudi Arabia. Saudi Pharm J;27(2):235-239.

Badiger, S, Kundapur, R, Jain, A, Kumar, A, Pattanshetty, S, & Tahkolkaran, N. (2012). Self-Medication Patterns Among Medical Students in South India. Australas Med J;5(4):217-220.

Blebil, A, Dujaili, J, Elkami, R, Tan, HLK, Tai, MS, & Khan, TM. (2020). Community Pharmacist's Role in Providing Oral Health-Care Services: Findings from Malaysia. Journal of Pharmacy and BioAllied Sciences;12(1):64-71.

Corrêa Da Silva, M, Soares, MCF, & Muccillo-Baisch, AL. (2012). Self-Medication in University Students from The City of Rio Grande, Brazil. BMC Public Health; 12:339.

Ehigiator, O, Azodo, CC, Ehizele, AO, Ezeja, EB, Ehigiator, L, & Madukwe, IU. (2013). Self-Medication Practices Among Dental, Midwifery and Nursing Students. Eur J Gen Dent;2(1):54-57.

Furreh, HF, Eltayeb, AMA, Ahmed, MM, Mohamed, MA. and Mohamed Osman, MH. (2016). Self-Medication Practice Among Health Science Students in International University of Africa (IUA), Khartoum, Sudan. World J Pharm Res;5(5):61-69.

Golar, SK. (2011). Use and Understanding of Analgesics (Painkillers) By Aston University Students. Biosci Horizons;4(1):71-78.

Grigoryan, L, Germanos, G, Zoorob, R, Juneja, S, Raphael, JL, & Michael, K. (2019). Use of Antibiotics Without a Prescription in The U.S. Population. Ann Intern Med;171(4):257-263.

Gutema, GB, Gadisa, DA, Kidanemariam, ZA, Berhe, DF, Berhe, AH, & Hadera, MG. (2011). Self-Medication Practices Among Health Sciences Students: The Case of Mekelle University. J Appl Pharm Sci; 1(10):183-189.

Haque, MA, Rahmann, NA, Judy, McKimm J, Kibria, GM, Majumder, MAA, & Haque, SZ. (2019). Self-Medication of Antibiotics: Investigating Practice Among University Students At The Malaysian National Defense University. Infect Drug Resist; 12:1333-1351

Helal, RM, & Abou-ElWafa, HS. (2017). Self-Medication in University Students from The City of Mansoura, Egypt. J Environ Public Health; 9145193.

Jain, A, Bhaskar, DJ, Gupta, D, Agali, C, Yadav, P, & Khurana, R. (2016). Practice of Self-Medication for Dental Problems in Uttar Pradesh, India. Oral Health Prev Dent; 14(1):5-11

Jain, S, Thakur, A, Peepre, K, Kaushal, S, Kasar, & P. (2018). Prevalence of Self-Medication Practices Among the Residents of Urban Slums Located Near Government Medical College, Jabalpur. Int J Community Med Public Health;5(2):811-817.

Kalra, D, Kini, P, Kalra, R, & Jathanna, V. (2015). Assessment of Self-Medication Among Dental Students in Pune City, Maharashtra: A Cross-Sectional Survey. J Indian Assoc Public Health Dent;13(3):318.

Kalyan, VS, Sudhakar, K, Srinivas, P, Sudhakar, GV, Pratap, KV, & Padma, TM. (2013). Evaluation of Self-Medication Practices Among Undergraduate Dental Students of Tertiary Care Teaching Dental Hospital in South India. J Educ Ethics Dent;3(1):21-25.

Masud, M, Mohamed, ZA, Azman, NF, & Rahim, MAA. (2020). The Practice, Perception and Awareness of Self-Medication for Dental Pain in Malaysian Dental Students. J Int Med Res;13(2):697-703.

Mehta, RJ, & Sharma, J. (2015). Knowledge, Attitude and Practice of Self-Medication among Medical Students, IOSR Journal of Nursing and Health Science (IOSR-JHNS); 4(1): 89-96.

Merriam-Webster Inc. (2021). Dictionary: Self-Medication. Massachusetts: Merriam-Webster,

Niwandinda, F, Lukyamuzi, EJ, Ainebyona, C, Ssebunya, VN, Murungi, G, & Atukunda, EC. (2020). Patterns and Practice of Self-Medication Among Students Enrolled at Mbarara University of Science and Technology in Uganda. Int Pharm Res Pract;9:41-48.

Rao, A, Simon, A, Rajesh, G, Shenoy, R, & Pai, M. (2015). Trends in Self-Medication for Dental Conditions among Patients Attending Oral Health Outreach Programs in Coastal Karnataka, India. Indian J Pharmacol;47(5):524.

Sankdia, R, Agrawal, M, Rekha, P, & Kothari, NA. (2017). Questionnaire-Based Study Regarding the Knowledge, Attitude and Practice of Self-Medication among Second Year Undergraduate Medical Students. Int J Pharmacol Clin Sci;6(1):1-5.

Sihavong, A, Lundborg, CS, Syhakhang, L, Akkhavong, K, Tomson, G, & Wahlström, R. (2006). Antimicrobial Self-Medication for Reproductive Tract Infections in Two Provinces In Lao People's Democratic Republic. Sex Transm Infect ;82(2):182-186.

Shivlal, R, Sudhir, R, Rahul, B, Shirish, D, Shobha, R, & Rakhi, C. (2015). Prevalence of Self-Medication Among Dental Patients in Rural Area of Maharashtra, India: A Cross-Sectional Study. Indian J Oral Sci;6(2):51.

Sontakke, SD, Bajait, CS, Pimpalkhute, SA, Jaiswal, KM, & Jaiswal, SR. (2011). Comparative Study of Evaluation of Self-Medication Practices in First and Third-Year Medical Students. Int J Biol Med Res;2(2):561-564.

Stocking, S, & Gubili, J. (2004). Mosby's Dental Dictionary. St. Louis: Mosby.

Tesfamariam, S, Anand, IS, Kaleab, G, Berhane, S, Woldai, B. & Habte, E. (2019). Self-Medication with Over-the-Counter Drugs, Prevalence of Risky Practice and Its Associated Factors in Pharmacy Outlets of Asmara, Eritrea. BMC Public Health;19(1):159.

World Health Organization. (1998). The World Health Report 1998 – Life in the 21st century: A vision for all. Geneva: WHO.

Yadav, AK, Rai, BK, Budhathoki, SS, Ghimire, A, Shrestha, SR, & Malla, GB. (2016). Self-Prescription of Paracetamol by Undergraduate Students in BP Koirala Institution of Health Sciences. J Nepal Med Assoc; 55(203):11-15.

Zaidi, SF, Alotaibi, R, Nagro, A, Alsalmi, M, Almansouri, H, & Anwar Khan, M. (2020). Knowledge and Attitude Towards Antibiotic Usage: A Questionnaire-Based Survey Among Pre-Professional Students at King Saud bin Abdulaziz University for Health Sciences on Jeddah Campus, Saudi Arabia. Pharmacy;8(1):5.