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Original Research Article

Prevalence and Pattern of Self-Medication Practices in Patients at a Tertiary Care Centre: A Cross-Sectional Study

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Abstract

Introduction & Background: Self-medication is prevalent worldwide. The practice of self-medication has been extensively researched in published literature for medical ailments but there is dearth of information about this malpractice among dental patients.

Objective: This study was planned to determine the prevalence and pattern of self-medication, drugs that are frequently self-medicated and the reasons for resorting to self-medication among dental patients.

Methods: This was descriptive cross-sectional study among 377 dental patients of a tertiary care centre. After obtaining institutional ethical approval and informed consent from each participant, data was collected via direct interview and analyzed for prevalence, knowledge, attitude and practices of self-medication. All the data was tabulated, analyzed, results expressed in percentages.

Results: Prevalence of self-medication in our study was 68.96% (260/377). It was higher in males than females. Most common diagnosis was dental caries followed by periodontitis or dental abscess. The most frequently used drugs were analgesics (73.46%), followed by antimicrobials (6.54%) for chief complaints of pain, fever, or infection by selecting drugs from their previous prescription (41.54%) for various reasons most commonly attributed to easy availability of medicines at pharmacies (44.62%). It is of concern that more than half of them (54.23%) were unaware of the drugs that they were consuming and the hazards of self-medication. Furthermore, majority saved the remaining drugs for later use (82.60%) and admitted that they are likely to indulge in self-medication within next 6 months (78.08%) and/or recommend drug(s) to family members or friends (53.46%).

Conclusion: Prevalence of self-medication is high in dental patients. Hazards of self-medication are enormous chiefly gastrointestinal adverse effects, renal or hepatic damage with analgesics & the global emergence of multidrug-resistant pathogens with the use of antimicrobials in suboptimal

dose or for inadequate duration. Our study highlights the urgent need for monitoring of drug use & dental health education to limit the hazards of self-medication and antimicrobial resistance.

Keywords: Dental Patients; Prevalence and Pattern; Self-Medication

Introduction

According to the World Health Organization (WHO), self-medication is defined as "the use of medicines for self-diagnosed disorders" or "the use of a prescribed medicines in continued or intermittent manner for chonic or recurring disorders without doctor consultation."[1] Self-medication includes obtaining and consuming drugs without the advice of a doctor for either diagnosis, treatment of a disease, or for surveillance of treatment. This comprises of acquiring and using medicines without prescription, resubmitting old prescription to purchase new medicines, using left-over medicines stored at home or sharing of medicines with others having similar symptoms.[1]

Self-medication is prevalent worldwide and practiced globally with a varied frequency in a range of 31-71% in India, 59% in Nepal as compared to a much higher prevalence of up to 68% in European countries.[8] Numerous studies have reported that self-medication is a common behaviour in both developed as well as developing countries.[2] It is observed more frequently in the countries of economic transition where the prescription legislation is not well-enforced and the drugs are freely available over-the-counter.[3] In India, almost every pharmacy sells drugs without a prescription, a phenomenon seen in many developing countries. Easy access to drugs due to over-the-counter availability along with overt marketing campaigns by pharmaceutical companies fosters the practice of self-medication.

One of the major problems with self-medication is the complete absence or lack of clinical assessment by a qualified healthcare professional, which results in deleterious consequences ranging from missed diagnosis or delays in accurate diagnosis and consequently its appropriate therapy especially when conditions like oral cancers are involved where the survival of the patient depends greatly on early diagnosis, drug interactions between prescription and non-prescription drugs to the more serious ones comprising of adverse drug reactions and events, masking of malignant or potentially fatal diseases, or development of superinfections.[4] This practice of self-medication emmeshes many other inorganic risks due to the inadequate use/overuse of medicines, or unnecessary use of expensive medicines.[5] It can even progress to drug dependence and drug addiction with some drugs.

The practice of self-medication coupled with poor awareness about the potentially hazardous adverse effects of the drugs leads to increased healthcare costs and risk of serious complications. For instance, intake of excess dose of analgesics/NSAIDs can lead to renal or hepatic damage and gastrointestinal complications. The inappropriate use of antibiotics by taking suboptimal dose of antibiotics or taking it for inadequate duration leads to emergence of resistant bacterial strains, ending up in global pandemic of multidrug-resistant pathogens.[1] Antibiotic resistance is one of the major public health concerns world-wide.[4] Moreover, the lack of a good primary health-care system in developing countries along with the cost issues leads to irrational use of these drugs. With regard to this, the World Health Organization (WHO) has recommended to all countries to

strengthen their public health systems in order to improve public access to appropriate antibiotics, along with their ability to perform surveillance on antimicrobials use and ensure compliance with the rational use of drugs.

The practice of self-medication has been extensively researched in published studies but there is dearth of information about this malpractice among dental patients in developing countries where oral health burden is more compared to developed countries of the world.[6,7] Also, literatures abound on practice of self-medication for medical ailments but there is paucity of information on the prevalence and pattern of self-medication for dental complaints especially in Delhi-NCR. Most of the previously published studies were limited to investigate the practice of self-medication using antimicrobials only.[2,3,9] Hence, this study was planned to determine the prevalence and pattern of self-medication for the management of oral health problems, drugs that are frequently self-medicated and the reasons for resorting to self-medication among dental patients at a tertiary care centre of Delhi-NCR.

Aims and Objectives

To determine the prevalence of self-medication, factors associated with it and determine knowledge (awareness), attitude, practices of self-medication among dental patients presenting at the OPD and oral health outreach programs of a tertiary care centre Delhi-NCR, India by means of questionnaire-based interview.

Methods

It was a descriptive cross-sectional, structured-questionnaire based study with close-ended questions conducted by interviewer among adult patients visiting ESIC Dental College and Hospital, Delhi under the aegis of Department of Oral Medicine and Radiology (OMR), and Department of Pharmacology. This study was conducted between 01 June 2019 to 30 March 2020 at the ESIC Dental College and Hospital, Delhi. 377 consenting respondents were interviewed with the aid of pre-validated structured questionnaire after obtaining informed consent.

Sample Size

A pilot study was conducted, prior to the start of the main study for sample size determination. A minimum sample size of 377 was estimated (distribution of response 50%, with 95% confidence interval and a 5% margin of error). Convenience sampling technique was used and the required sample size was calculated. The power and sample size was calculated by G*Power version 3.1.9.2 (prevalence 0.4–0.7, α error probability = 0.05, power [1− α] = 0.80). The final sample was 377 study subjects, who were randomly selected from the patients presenting at the OPD and oral health outreach programs of the ESIC Dental College and Hospital, Delhi.

Study Population:

Inclusion criteria:

Adult patients aged 18 years or above presenting at dental OPD and outreach programs of ESIC Dental College and Hospital, Delhi who were able to understand the questions of the survey & able to give objective replies on basis of their assessment.

Exclusion criteria:

Those excluded from the study include:

1. Patients that did not use self-medication or who have never experienced oral health problems before presentation to OPD/ outreach programs of the ESIC Dental College and Hospital, Delhi.
2. Patients who were 17 years and below.
3. Patients not willing to give informed consent or those who were not able understand English/Hindi.
4. Patients who are physically and mentally unable to participate and give objective replies.
5. Patients suffering from chronic debilitating medical conditions like sickle cell disease,

uncontrolled diabetes mellitus, malignant neoplasm, hepatic and renal diseases.

The study was conducted after obtaining ethical approval from the Institutional Ethics Committee (IEC) (Protocol No: 115-E-13/12/01/2010(DC)21) and written informed consent from participants. The informed consent form & patient information sheets were translated to participant's vernacular language (Hindi). The patient information sheets were given to each participant and written informed consent was obtained from each participant during enrolment in this study. Respondents are those patients who fulfil the inclusion criteria and provide objective replies to the structured questionnaire. The questionnaire was pretested for reliability and validity. The questionnaire consisted of 14 close-ended questions. The questionnaire included structured panels for assessment of prevalence and frequency of self-medication practices of the respondents and its outcome, reasons for self-medication, knowledge and awareness about the self-medicated drug/drugs in terms of their indications, adverse effects & patient's attitude and behaviour about the risks and hazards of self-medication.

After obtaining informed consent from each participant, data was collected by interviewer-administered structured-questionnaire with close-ended questions via direct interview and analysed for prevalence, awareness, knowledge, attitude and practices of self-medication in addition to demographic information such as age, gender, occupation, education, and monthly family income. All the data was coded, entered in Microsoft Excel and analyzed.

Results

Within the period of this study, a total number of 377 patients participated in this study. The participants were between ages 18 and 75 years and were grouped into six age groups as shown in Table 1. The mean ±SD age of participants was 35.15±16.36 years. Majority of the participants were married 346(91.78%), and the participation of males 231(61.27%) was more compared to females 146(38.72%). Only 68(18.04%) of the respondents were illiterate and 103(27.32%) of the respondents were unemployed, and 72(19.10%) of them undertook unskilled work. Around 1/3rd of participants 122(32.36%) had a monthly income of <10,000/ month. The sociodemographic characteristics of the respondents are presented in Table 1.

The most common diagnosis of the participants was dental caries 128(33.95%) followed by periodontitis 99(26.25%) followed by abscess either periapical or periodontal 66(17.51%). [Fig. 1] Among the 377 respondents, 101(26.79%) had never visited a dentist in their lifetime. Among those who had visited the dentist before presentation to our hospital,197(52.25%) had a dental visit less than a year before whereas 79(20.95%) visited more than year ago. The participants did seek professional help on an average of after 5.10 months in females but 7.51 months in males after their symptoms began. [Fig. 1, Table 1].

Among the total 377 respondents, 260(68.96%) respondents reported resorting to self-medication. [Table 1] Among the 260 respondents who undertook self-medication, 163(43.23%) respondents had self-medicated twice or more in the past 6 months, and 97(25.73%) respondents always turned to self-medication for their dental problems. [Table 1] The most frequently used drugs for self-medication were analgesics 191(73.46%), followed by antimicrobials 17(6.54%) & traditional medicines.[Table 2, Fig. 2]

Among all analgesics, paracetamol 77(29.61%) was most frequently used drug followed by diclofenac 49(18.86%). The route of administration was commonly employed was oral 256(98.46%) whereas topical route or both oral & topical route was employed by 2(0.77%) each. [Table 2] The common dental problem warranting self-medication was pain 204(78.46%) followed by fever 35(13.46%)

followed by other symptoms like swelling in face 19(7.31%) or others like bleeding gums, infection, cough 04(1.50%).[Table 2] It is of concern that 141(54.23%) of people undertaking self-medication were unaware of the drugs that they were consuming. [Table 2] The most common reason given for self-medication was easy availability of medicines at pharmacies through previous prescriptions or even without prescriptions 116(44.62%) followed by lack of time because of busy work schedule & excess work stress 36(13.85%) and lack of access to dental services 21(8.08%). [Fig. 3] Their source of drug information and instructions for self-medication was selection of drugs from their previous prescription from dental or medical professional 108(41.54%), influence by family/friends/neighbours or used a drug(s) for dental problems which was prescribed to friends/family members for their dental problems 88(33.85%) followed by the drug vendor 27(10.38%), pharmacist 20(7.69%) while others were online information, media, drug advertisement/brochure, school/college etc 17(6.54%).[Fig. 4] The selection of drugs used for self-medication was influenced by trade name of the drug in majority of respondents 121(46.54%) or it's price 92(36.17%), indication 94(35.46%) whereas the dose was randomly selected 92(36.92%) or on how much the patients felt ill 89(34.23%). [Table 2].

The outcome of self-medication was relief of symptoms in majority of participants 240(92.31%) leading to stopping the drug treatment on relief of symptoms 230(88.46%). [Table 2]. No Adverse effects faced by majority of the patients taking self-medication 184(70.77%). Among the rest of the patients, mild adverse effects comprising of GIT adverse effects 72(27.69%) such as diarrhea, nausea, vomiting, gastritis, dyspepsia 72(27.69%) & rarely others such as skin allergy, pruritis in 3(1.15%) patients. [Table 2]. 215(82.69%) saved the remaining drugs for later use though majority denied using the saved drugs after expiry date 226(86.92%). [Table 2].

It is of concern that 141(54.23%) more than half of the subjects practicing self-medication patients unaware of the drugs that they were consuming in terms of their indications, dosage, adverse effects. [Table 2]. 114(43.85%) had no clue about the hazards of self-medication whereas 44(16.92%) perceived that self-medication was not hazardous at all[Table 2]. Those who considered it hazardous are of the view that it can damage the organs of the body 77(29.62%), or could lead to worsening of existing illness 10(3.85%) or others 15(5.77%) like drug resistance/drug failure, poisoning, death, addiction, or mental illness[Table 2]. Majority of the participants reported that they are likely 157(60.38%) or very likely 46(17.69%) to engage in self-medication within next 6 months. 188(72.31%) patients are not confident in using drug successfully for any type of illness by themselves while 139(53.46%) recommend drug(s) to family members or friends[Table 2].

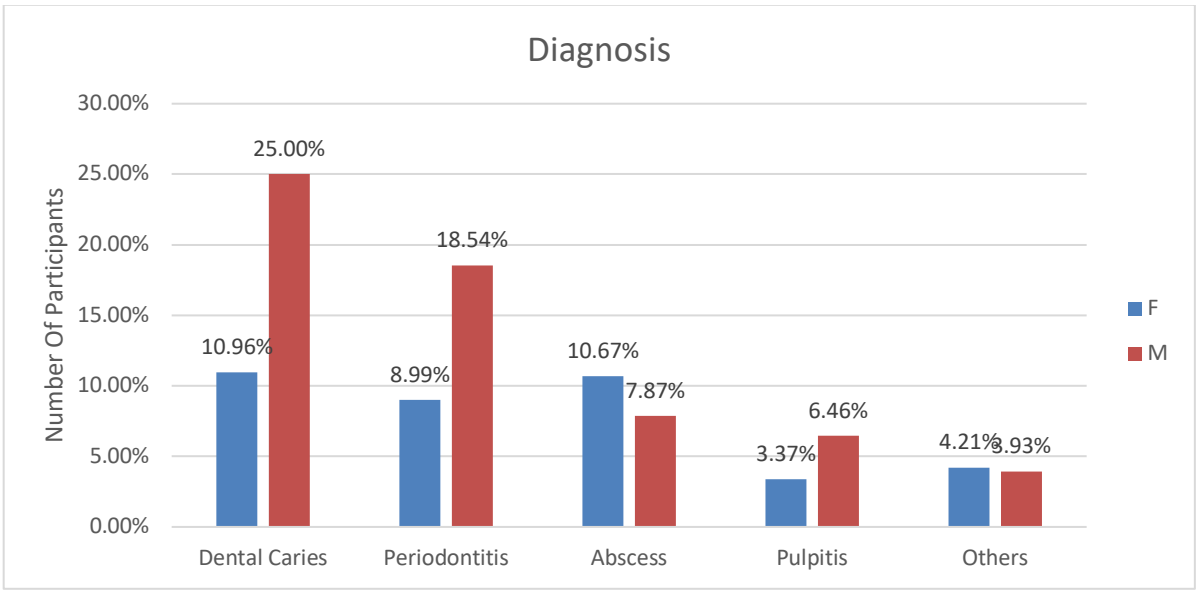

Figure 1: Diagnosis of participants

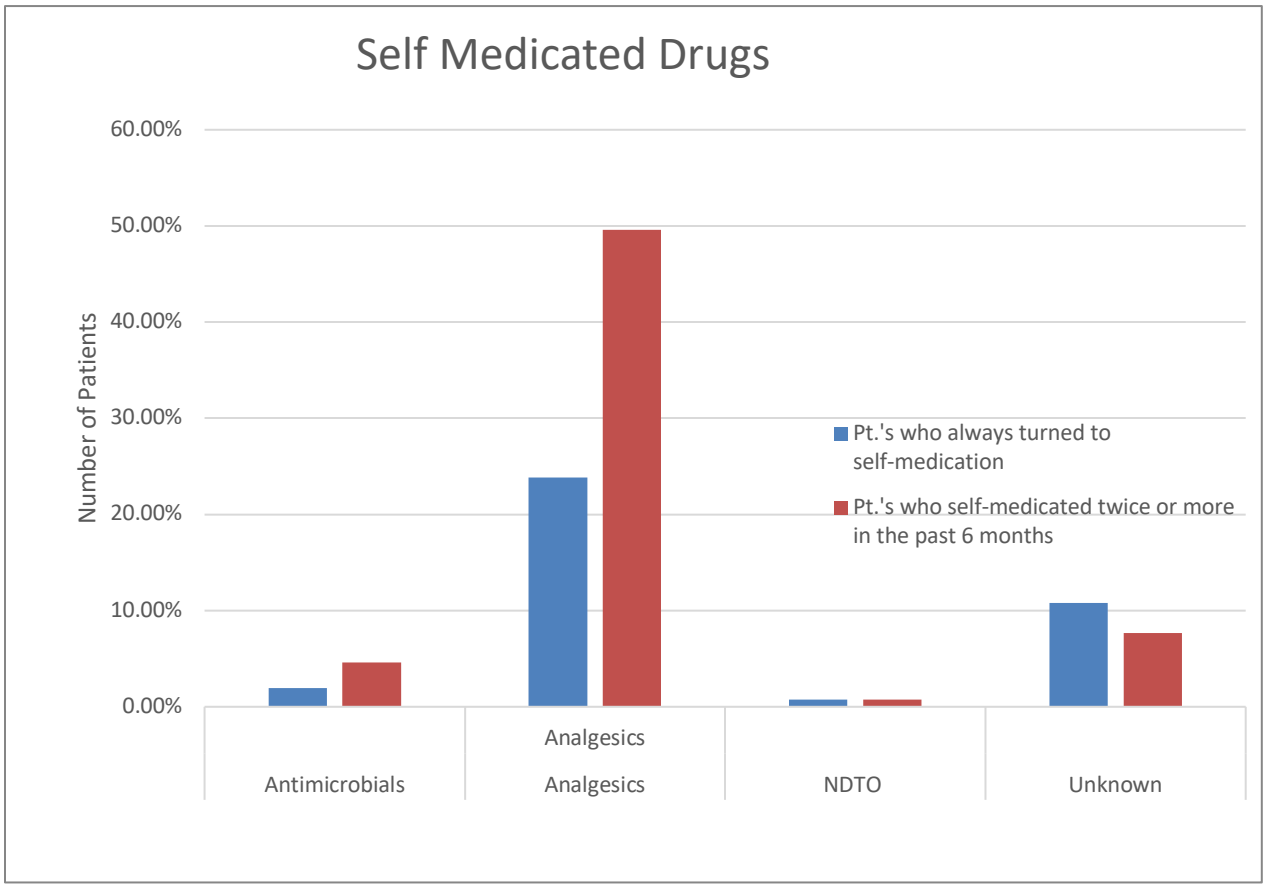

Figure 2: Self-medicated drugs

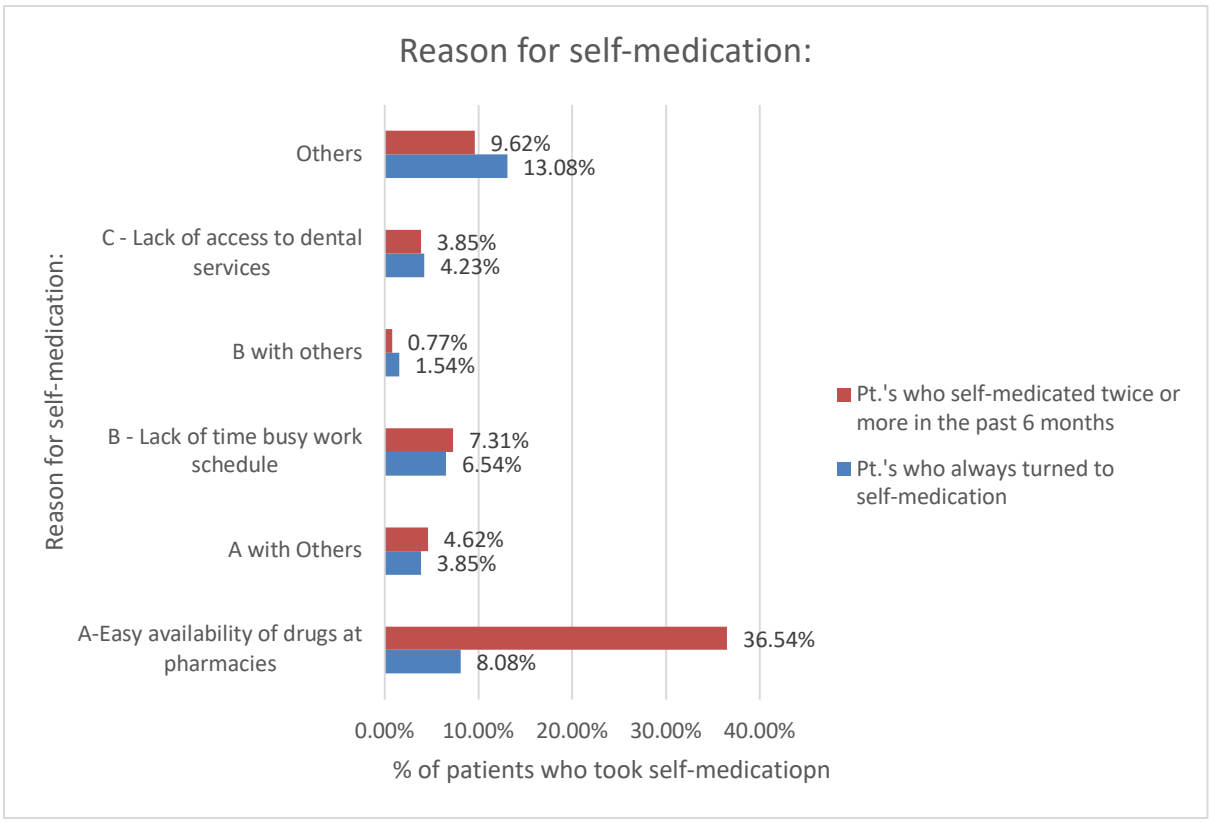

Figure 3: Reason for self-medication

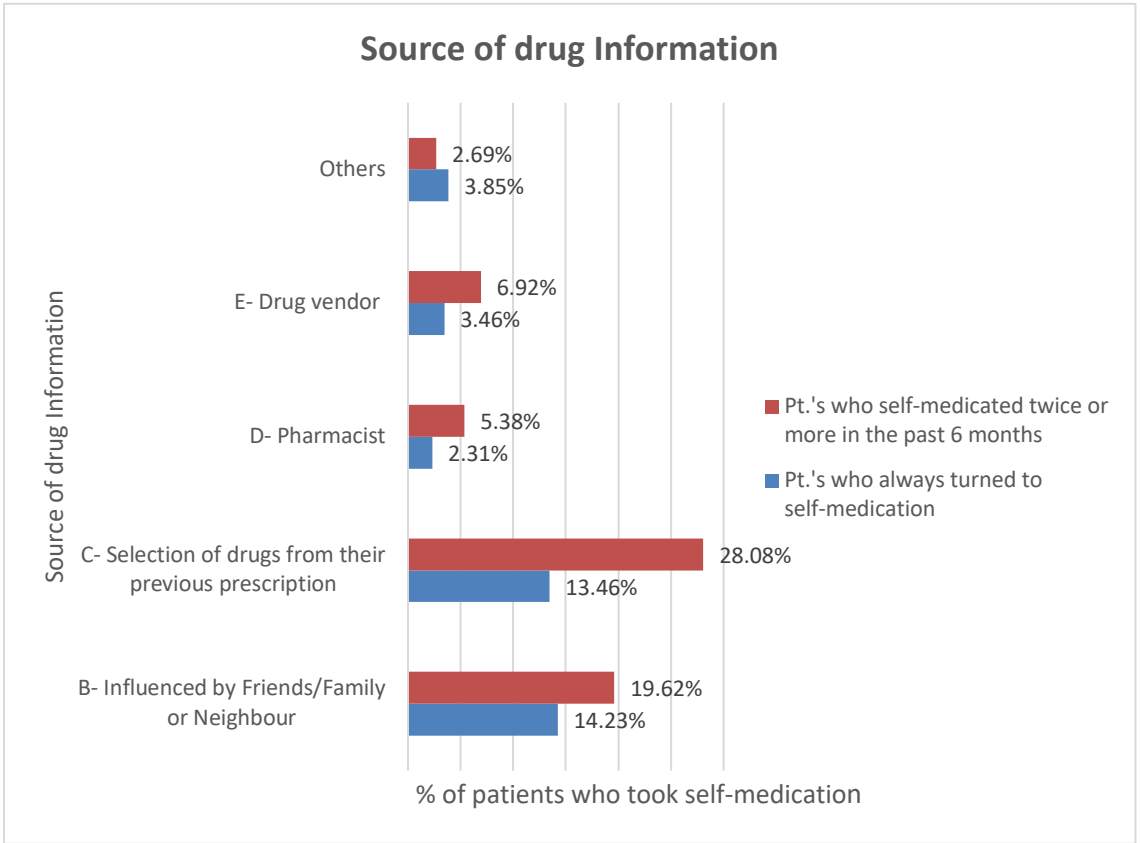

Figure 4: Source of drug information & instructions for self-medication

Table 1: Demographic characteristics

	Females		Males		Total	
	Number (n)	**Percentage (%)**	**Number (n)**	**Percentage (%)**	**Number (n)**	**Percentage (%)**
Age:						
18-28	33	8.75%	47	12.47%	80	21.22%
29-38	40	10.61%	53	14.06%	93	24.67%
39-48	51	13.53%	25	6.63%	76	20.16%
49-58	19	5.04%	70	18.57%	89	23.61%
59-68	3	0.80%	15	3.98%	18	4.77%
>68yr	0	0.00%	21	5.57%	21	5.57%
Marital status:						
Married /	133	35.28%	213	56.50%	**346**	**91.78%**
Single	13	3.45%	18	4.77%	31	8.22%
Race						
Indian	146	38.73%	231	61.27%	377	100.00%
Specify, if others	0	0	0	0	0	0
Education						
Illiterate	41	10.88%	27	7.16%	68	18.04%
Primary	44	11.67%	45	11.94%	89	23.61%
High school	37	9.81%	99	26.26%	136	36.07%
College	24	6.37%	60	15.92%	84	22.28%
Occupation						
Unemployed (including housewives)	88	23.34%	15	3.98%	103	27.32%
Farmer	2	0.53%	3	0.80%	5	1.33%
Unskilled worker	10	2.65%	62	16.45%	72	19.10%
Skilled worker/ artisans	12	3.18%	62	16.45%	74	19.63%
Student/ medical workers (incl. doctors, nurses, etc)	12	3.18%	11	2.92%	23	6.10%
Professionals/ Civil servants, Businessmen/Traders	22	5.84%	67	17.77%	89	23.61%
Retirees / Armed forces & paramilitary		0.00%	11	2.92%	11	2.92%
Monthly family income (INR):						
<10,000	65	17.24%	57	15.12%	122	32.36%
10,000 and above	81	21.49%	174	46.15%	255	67.64%
Total	146	38.72%	**231**	**61.27%**	377	100 %
Study participant's Practices & factors associated with self-medication	**Females**		**Males**		**Total**	
	Number (n)	**Percentage (%)**	**Number (n)**	**Percentage (%)**	**Number (n)**	**Percentage (%)**
2. Date & Time from the last dental visit						
Never visited a dentist in their lifetime	28	7.43%	73	19.36%	101	26.79%
Less than a year	86	22.81%	111	29.44%	197	52.25%
More than a year	32	8.49%	47	12.47%	79	20.95%

3. How long after your symptoms began did you seek professional help?	5.10 months		7.51 months		6.50 months	
4. Self-medication frequency:						
Never took self-medication	53	13.79%	64	16.98%	117	31.03%
Always turned to self-medication for their dental problems.	21	5.57%	77	20.42%	97	25.73%
Self-medicated twice or more in the past 6 months	73	19.36%	90	23.87%	163	43.23%
Total	**146**	**38.72%**	**231**	**61.27%**	**377**	**100 %**

Table 2: Study participant's Knowledge/Awareness and Attitude, Practices, & factors associated with self-medication

		number(n)	**Percentage(%)**
5a. Frequently self-medicated drug:	Antibiotics	17	6.54%
	Analgesics	**191**	**73.46%**
	Non-doctor treatment and orthodox medications (NDTO)	4	1.54%
	Unknown	48	18.46%
	Grand Total	260	100.00%
5b. Route of administration	Oral	**256**	**98.46%**
	Oral, Topical	2	0.77%
	Topical	2	0.77%
	Grand Total	260	100.00%
5c. Indication	Cough	1	0.38%
	Fever	35	13.46%
	Infection	1	0.38%
	Pain/ toothache with Other Symptoms	**204**	**78.46%**
	Swelling	19	7.31%
	Grand Total	260	100.00%
6. Reason for self-medication:	A - Easy availability of medicines at pharmacies through previous prescriptions or even without prescriptions	**116**	**44.62%**
	A with Others	22	8.46%
	B- Lack of time because of busy work schedule & excess work stress	36	13.85%
	B with others	6	2.31%
	C- Lack of access to dental services / Dentist not available	21	8.08%
	Others : *	59	22.69%
	Grand Total	260	100.00%
7. Source of drug Information and instructions for self-medication	B- Influenced by Friends/Family or Neighbor	88	33.85%
	C- Selection of drugs from their previous prescription	**108**	**41.54%**
	D- Pharmacist	20	7.69%
	E- Drug vendor	27	10.38%
	Others : Online, Media, Advertisement/brochure, School/college, Never received	17	6.54%

	Grand Total	260	100.00%
8. The selection of drugs by:	Generic	86	33.08%
	Random	53	20.38%
	Trade Name	121	46.54%
	Grand Total	260	100.00%
Influenced by:	Brand name / company	70	26.95%
	Price	92	36.17%
	Indication of the drug	94	35.46%
	Adverse effects	4	1.42%
	Grand Total	260	100.00%
9. The dose was determined by:	Random selection	96	36.92%
	Instruction on the package	70	26.92%
	Online resources	5	1.92%
	How much they felt ill	89	34.23%
	Grand Total	260	100.00%
10a. Outcome of self-medication:	Symptom relief	240	92.31%
	Symptoms got worse	7	2.69%
	No Effect	13	5.00%
	Grand Total	260	100.00%
10b. Full/Partial course of treatment	Completed the full course of treatment	30	11.54%
	Stopped the medication when the symptoms disappear	230	88.46%
	Grand Total	260	100.00%
10c. Adverse effects faced by the patient on taking self-medication	No adverse effects	184	70.77%
	GI adverse effects	72	27.69%
	Increased BP	1	0.38%
	Severe diarrhea, fever or Skin Allergy/ Pruritis	3	1.15%
	Grand Total	260	100.00%
10d. Saved the remaining drugs for later use;	No	45	17.31%
	Yes	**215**	**82.69%**
	Grand Total	260	100.00%
10e. Use the drugs after expiry date	No	226	86.92%
	Yes	34	13.08%
	Grand Total	260	100.00%
11. Patient's Knowledge of the drugs that they were consuming { indications, dosage, adverse effects etc}	Aware	119	45.77%
	Unaware	141	54.23%
	Grand Total	260	100.00%
12. Awareness about hazards of self-medication	A- No idea	**114**	**43.85%**
	B- Not hazardous	44	16.92%
	C1- Hazardous- Damage to body organs	77	29.62%
	C2- Hazardous - Worsening of existing illness	10	3.85%
	C3-C7 : Drug resistance/drug failure OR Poisoning Death OR Addiction OR Mental illness	15	5.77%
	Grand Total	260	100.00%
	Very likely	46	17.69%

13. Likelihood of self-medication within next 6 months	Likely	**157**	**60.38%**
	Not sure	20	7.69%
	Unlikely, Very unlikely	37	14.23%
	Grand Total	260	100.00%
14. Patients confident in using drug successfully for any type of illness by themselves	No	188	72.31%
	Yes	72	27.69%
	Grand Total	260	100.00%
15.Recommendation of drug(s) to family members or friends	No	121	46.54%
	Yes	139	53.46%
	Grand Total	260	100.00%

*-Dental visit is expensive / higher cost for dental consultation / cost-saving reasons OR Long queues at hospitals & personal incontinence OR The tooth problem not being serious initially at the time of initiating self-medication OR Dental prescription not necessary OR Religious or cultural beliefs; OR Traditional/Alternative medicine is best, without side-effects OR Dental fear OR Dental visit is expensive / higher cost for dental consultation / cost-saving reasons OR Long queues at hospitals & personal incontinence OR The tooth problem not being serious initially at the time of initiating self-medication OR Dental prescription not necessary OR Religious or cultural beliefs; OR Traditional/Alternative medicine is best, without side-effects OR Dental fear

Discussion

According to the World Health Organization, self-medication is defined as "the use of medicines for self-diagnosed disorders" or "the continued or intermittent use of a prescribed medicines without doctor consultation for chronic or recurring disorders.[1,7] The practice of self-medication has been in existence worldwide since decades and reported prevalence from studies varies from 11% in Spain, USA (17%), Lithuania (22%) to as high as 92.3% in southern Nigeria (92,.3%), Cameroon (67.8%), Jordan (46%), Greece (44.6%).[7] The situation continues to worsen with time particularly in developing countries where high prevalence has been reported till date.[9] Hence, this study was planned to determine the prevalence and pattern of self-medication in the management of oral health problems, drugs that are frequently self-medicated among dental patients at a tertiary care centre of Delhi-NCR and their reasons for resorting to self-medication.

Within the period of this study, a total number of 377 patients between age of 18 and 75 years participated in this study. The mean age of the subjects was 35.43 ± 15.10 years. Similar results were found in previously published studies on self-medication.[10,11] While previous studies have reported a positive association between self-medication and age, level of education, this was not observed in our study.[7,12] Majority participants were married (91.78%), males (61.27%) and were in the 2-4th decades of life which is the most active and working population age group of India who may not have enough time to seek for proper medical and dental consultation but find it easier to indulge in self-medication. [Table 1]. This is in consonance with results from previous published studies in Nigeria, Turkey and India found that males were 1.24 times more likely to use self-prescribed drugs than females [10,13,14] but in contrast to in other studies where higher prevalence is reported in females [7,8,15] and unmarried/single patients.[12] Only 18.04% of the respondents were illiterate whereas considerably higher proportion were either unemployed (27.32%), or undertook unskilled work (19.10%).[Table 1]. The practice of self-medication was observed more among the less-educated than educated respondents generally due to poor access to dental treatments as well as poor purchasing power. This conforms to reports from another study which indicated higher level of self-medication among less educated and low socio-economic class.[7,8] Around 1/3rd of participants (32.36%) had a monthly income of <10,000/ month[Table 1]. These demographic characteristics are similar to another study by Simon AK assessing trends

in self-medication in dental conditions among adults in coastal Karnataka, India.[8]

Majority of the participants were diagnosed to be suffering from either dental caries (33.95%) or periodontitis (26.25%) which if left untreated, progresses to dental abscess (17.51%) either periapical or periodontal in location.[Fig. 1] This is in contrast to another study where more than half of the patients were diagnosed to be of periodontitis.[7] Among the 377 respondents, nearly half of them (52.25%) had a dental visit less than a year before presentation to us whereas 20.95% visited more than year ago and 26.79% had never visited a dentist in their lifetime[Table 1]. Similar results were reported by Simon AK assessing trends in self-medication for dental conditions among adults in coastal Karnataka, India.[8] The participants did seek professional help after their symptoms began on an average of around 5.10 months in females and 7.51 months in males[Table 1]. This association between gender and time of seeking professional help after indulging in self-medication where females were likely to seek professional consultation earlier than males is could be attributed to lower threshold of pain in females. This finding is also consistent with the study by Simon AK assessing trends in self-medication for dental conditions among adults in coastal Karnataka, India other studies which demonstrated similar pattern among females.[8] Similar trend was reported in another study by Anyanachi CE *et al* where the patients delay professional diagnosis and treatment and report only when the symptoms predominantly pain becomes unbearable after their self-medication practice failed to resolve their health problems.[13] Similarly, Agbor MA *et al* in 2011 reported that patients consider the diagnosis and treatment from oral health professionals only when all the remedies known to them have failed to cure or treat the oral health problem primarily due to lack of knowledge and awareness in dental health among the population.[16]

Among the total 377 respondents in our study, 260(68.96%) respondents reported resorting to self-medication. It is of concern that among those respondents who took self-medication, 43.24% respondents had self-medicated twice or more in the past 6 months, and 25.73% respondents always turned to self-medication for their dental problems[Table 1]. These results are in accordance with prevalence of 71% reported in Chennai, India[3] 70.7% in Sharjah[4] 70.2% in northern turkey[17] 67.8% in Cameroon[16] 62.6% in Nepal[11] and 80.6% in Nigeria.[13] However, much lower prevalence of 27.1% among adults in Serbia[19] 41.5% was reported in North Nigeria patients[7], 48.9% in south-west Nigeria,[15] and 43.24% in Mekelle, Ethiopia.[18] Several substances and drugs were used without professional consultation during self-medication. These substances ranged from traditional recipes and herbs to pharmacologically active drugs. The most frequently self-medicated drugs in our study were analgesics (73.46%), followed by antimicrobials (6.54%) to orthodox traditional medicines including clove oil, water with salt, native herbs etc. [Fig. 2] which is similar to observation of self-medicated drugs in previously published studies from India, Nepal and Turkey.[8,11,17] The use of analgesics as the most common drug during the self-medication can be attributed to their OTC availability, low price and participant's belief that they are not toxic or can do little harm. Among all analgesics, paracetamol (29.61%) was most frequently used drug followed by diclofenac (18.86%). Paracetamol is relatively safe, cheap, easily available remedy for pain across all social strata[Fig. 2]. The over-use of nonsteroidal anti-inflammatory drugs by consumers is equally worrisome especially when these drugs are combined with other drugs of the same group without having an idea of their dosage and adverse effects. The most common route of administration was oral (98.46%). The common dental problem warranting self-medication in our study were

pain/ toothache (78.46%) and fever (13.46%) followed by others like swelling in face (7.31%) or bleeding gums, infection, cough (1.50%)[Table 2]. Similar results were reported in previously published studies from India as well as Sharjah, Nigeria, Nepal and Turkey.[4,7,8,10,11,17]

The most common reason for self-medication in our respondents was easy availability of medicines at pharmacies through previous prescriptions or even without prescriptions (44.62%)[Fig. 3]. Same reason was reported in studies from other developing countries like Nigeria as prescription drugs are easily available over-the-counter in developing countries, in contrast to developed countries, e.g., US, European countries where strict criteria are in place to dispense drugs.[8,10,13] This reflects the need to control the sale of prescription drugs as well as over-the-counter medicines in developing countries. Next common reasons for resorting to self-medication in our respondents were being influenced by family/friends/neighbors and used the drug(s) which were prescribed to them for their dental problems (33.85%), lack of time because of busy work schedule coupled with excess workload (13.85%) and difficult access/lack to dental services (8.08%). Other less common reasons cited by our respondents were cost-saving reasons because of higher cost for dental consultation as the dental visit is expensive, long queues at hospitals, the tooth problem not being serious initially at the time of initiating self-medication, dental prescription not considered necessary, fear of dental treatment and the ailment is simple, religious or cultural beliefs, traditional/alternative medicine is perceived to be best without side-effects. Similar reasons were reported in previously published studies.[4,7,11] Low dental awareness, knowledge and awareness among majority of Indian population may be responsible for this attitude.

Majority of them selected self-medicated drugs from their previous prescription from dental or medical professionals (41.54%), whereas others were influenced by family/friends/neighbours or used drug(s) for dental problems which was prescribed to friends/family members for their dental problems (33.85%)[Fig. 4]. The drug vendor (10.38%), pharmacist (7.69%), media advertisement or drug promotional literature/brochure, online information (6.54%) served as other sources of drug information /instructions for self-medication[Fig. 4]. This conforms reports from other similar studies that identified previous prescriptions and pharmacy shops as major sources of drugs consumed.[2,7,11,13] This is contrary to the study by Komal Raj *et al*, in which the majority of the participants took advice from the pharmacist.[10] The selection of drugs used for self-medication was influenced by trade name of the drug in nearly half of respondents (46.54%) & the dose of these drugs was randomly selected (36.92%) or how much the patients felt ill (34.23%)[Table 2]. Similar trends in self-medication were reported in a study from Chennai that studied self-medication with antibiotics.[3]

It is of concern that more than half of the subjects (54.23%) practicing self-medication were unaware of the drugs that they were consuming in terms of their indications, dosage, adverse effects or the hazards of self-medication[Table 2]. Those who considered it hazardous are of the view that it can damage the organs of the body or could lead to worsening of existing illness, drug resistance/drug failure, poisoning, death, addiction, or mental illness[Table 2]. This poor awareness about the self-medicated drugs is in consensus with previously published studies on self-medication which report an awareness level of 47.9% and 45.2% in United States of America (USA) and Turkey respectively to a much lower awareness figures ranging from 22.8 to 37.9% in Ethiopia, India, Turkey and southern part of Nigeria.[12,17,20]

Around 3/4th of the participants (78.07%) reported that they are very likely or likely to

engage in self-medication within next 6 months though almost the same number of patients (72.31%) were not confident in using drugs successfully by themselves for any type of illness[Table 2]. Majority of these patients (82.69%) saved the remaining drugs for later use though majority denied using the saved drugs after expiry date (86.92%)[Table 2]. Nearly half of them (53.46%) would recommend these drug(s) to their family members or friends[Table 2]. This warns us of the fact that in addition to people themselves undertaking self-medication, they also propagate this erroneous practice by recommending drugs to others. Also, Geissler PW *et al* in 2000 had reported similar trend that the use of self-medication among family members influence and sometimes also recommend the other family members to use the same prescription used by them as these prescriptions could led to relief of their symptoms.[21]

Most of the participants in our study had relief of their symptoms (92.31%) after self-medication leading to stopping the drug treatment on resolution of symptoms with no major adverse effects [Table 2] which is in line with the results of previous study in Chennai, India.[3] Less than 1/3rd of respondents suffered adverse effects which were mostly mild GI adverse effects like diarrhea, nausea, vomiting, gastritis, dyspepsia & rarely others like skin allergy, pruritis[Table 2]. Nevertheless, this behaviour of self-medication can result in deleterious events ranging from drug misuse, drug-drug interactions, GI complications, hepatic or renal failure, drug addiction, drug toxicity, hypersensitivity in individual level to drug resistance to antimicrobials worldwide leading to emergence of superbugs untreatable with the available antimicrobials till date.[7] These consequences are sequelae of poor diagnosis, inappropriate indication, underdosing or overdosing of drugs common during the practice of self-medication. Also, non-doctor treatment and orthodox (NDTO) medications used in dental problems are non-allopathic remedies easily accessible and affordable, have no proven pharmacological data or their side effects been documented. This could cause irreversible pulpal damage and worsen an already exiting dental complaint and overall health of the patient. Hence, there is an urgent need to enlighten the public about the harmful effects of self-medication especially with antibiotics by the health-care professionals and government bodies to overcome the menace of antibiotic resistance due to global emergence of multidrug-resistant pathogens.

In view of our findings, we recommend that clearer drug supply policy, stricter drugs sale regulations, and constant monitoring are needed from the Central Drugs Standard Control Organization(CDSCO), and DCGI, Government of India to control the practice of self-medication and its hazardous consequences. It should be ensured that all drug retail outlets and drug sellers are registered, controlled drugs are dispensed only on prescription of the physicians; and the laws safeguarding drug use are duly enforced. Also, there is currently no policy on self-care in India. Safe self-care initiatives on self-medication should also be introduced which will help to limit the irrational use of drugs. National Health Insurance Scheme should be made to cover all socio-economic groups in order to encourage easy accessibilities of wide range of medical and dental consultations to the population, thereby discouraging the practice of self-medication.

There has been increase in trend of self-medication during the COVID-19 pandemic which can be overcome by new healthcare services, such as teledentistry, especially useful when the ability of patients to reach healthcare providers is limited for non-emergency conditions, such as during pandemics as COVID-19. The Ministry of Health and Family Welfare (MOHFW) can take measures to improve general public's access to qualitative and affordable medical care & strengthen efforts towards educating

the entire public on the dangers of indiscriminate and in-appropriate drug use, thus safeguarding them and the entire population from the dangers of safe medication.

This study will contribute significantly to the existing knowledge on self-medication to oral and dental problems. The outcome of this study may be useful for holistic oral health care planning and delivery in India. However, in the light of limitations of our study such as cross-sectional nature & limited to patients presenting to OPD and oral health outreach programs of our tertiary care centre, the findings of our study cannot be generalized till larger studies are done worldwide.

Conclusion

The present study shows that there is a growing trend of self-medication practice. The prevalence of self-medication in our study in patients of oral health problems in Delhi-NCR is very high (68.96%). Male gender and the recent dental visit were found to be more likely associated with self-medication. Easy availability of medicines at pharmacies in India without prescriptions as the main reason for resorting to self-medication coupled with lack of knowledge about the potential side effects of self-medicated drugs is hazardous to not only the participants but whole population.

This study also corroborates that the family members or friends of participants undertaking self-medication are at a higher risk. It is difficult to eradicate self-medication all-together and there is definitely an urgent need of implementing suggested measures to discourage this practice. New healthcare services, such as teledentistry are especially useful to reach patients at home for non-emergency conditions during pandemics as COVID-19.

Self-medication is at increasing at an alarming pace in Delhi-NCR and other metropolis cities and requires urgent interventions. It is crucial to confirm whether the beliefs about medicines are associated with self-medication practice as these findings can provide guidelines in public health education to improve the safety aspects of self-medication. Upon considering the strengths and limitations of our study, future research with relevant modifications such as targeting a larger population in different clinical settings can further confirm the results of our study.

Ethical Approval

The work has been approved by the institutional ethical committees (IEC) of ESIC Dental College & Hospital, Rohini, New Delhi-110085. (Protocol No: 115-E-13/12/01/2010(DC)21) dated 23.05.2019.

Abbreviations:

NCR - National Capital Region;
NDTO - Non-Doctor Treatment and Orthodox medications

References

1. World Health Organization. Guidelines for the regulatory assessment of medicinal products for use in self-medication [Internet]. 2000 [cited 2022 Oct. 11]. https://apps.who.int/iris/bitstream/handle/10665/66154/WHO_EDM_QSM_00.1_eng.pdf?sequence=1&isAllowed=y
2. Wang X, Lin L, Xuan Z, Li L, Zhou X. Keeping antibiotics at home promotes self-medication with antibiotics among Chinese university students. International journal of environmental research and public health. 2018 Apr;15(4):687.
3. Shamsudeen SM, Priya RS, Sujatha G, Muruganandhan J, Manikandan K. Self-medication with antibiotics: A knowledge, attitude, and practice appraisal of 610 dental patients in Chennai, India, from 2016 to 2017. J Edu Health Promot. 2018;7:66
4. AlQahtani HA, Ghiasi FS, Zahiri AN, Rahmani NI, Abdullah N, Al Kawas S. Self-medication for oral health problems among adults attending the University

Dental Hospital, Sharjah. J Taibah Univ Med Sci. 2019 Jul 23;14(4):370-375.
5. Luiza VL, Mendes LV, Tavares NU, Bertoldi AD, Fontanella AT, Oliveira MA *et al*. Inappropriate use of medicines and associated factors in Brazil: an approach from a national household survey. Health Policy and Planning. 2019 Dec 1;34(Supplement_3):iii27-35.
6. Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. Bulletin of the world health organization. 2005;83:661-669.
7. Idowu EA, Afolabi AO, Fakuade BO, Akintububo OB, Ibiyemi O. Self-medication profile of dental patients attending a north eastern tertiary hospital in Nigeria. Ann ib postgrad med. 2019 dec;17(2):173-180.
8. Simon AK, Rao A, Rajesh G, Shenoy R, Pai MB. Trends in self-medication for dental conditions among patients attending oral health outreach programs in coastal Karnataka, India. Indian J Pharmacol. 2015;47:524-529.
9. Ocan M, Obuku EA, Bwanga F, Akena D, Richard S, Ogwal-Okeng J, *et al*. Household antimicrobial self-medication: a systematic review and meta-analysis of the burden, risk factors and outcomes in developing countries. BMC Public Health. 2015 Aug 1;15:742.
10. KomalRaj MR, Padma K Bhat, Aruna CN. Selfmedication practices for oral health problems among dental patients in Bangalore: a cross sectional study. IOSR Journal Of Pharmacy. October 2015; 5(10):68–75.
11. Bhattarai R, Khanal S, Shrestha S. Prevalence of Self-medication Practices for Oral Health Problems among Dental Patients in a dental college: A Descriptive Cross-sectional Study. JNMA J Nepal Med Assoc. 2020 Apr 30;58(224):209-213.
12. Lawan UM, Abubakar IS, Jibo AM, Rufai A. Pattern, awareness and perceptions of health hazards associated with self medication among adult residents of kano metropolis, northwestern Nigeria. Indian J Community Med. 2013;38:144-151.
13. Anyanachi CE, Saheeb BD. Toothache and Self-Medication Practices: A study of patients attending a Niger Delta tertiary hospital in Nigeria. Annals of Medical and Health Sciences Research. 2014;4:6
14. Ilhan MN, Durukan E, Ilhan SO, Aksakal FN, Ozkan S, Bumin MA. Self-medication with antibiotics: Questionnaire survey among primary care center attendants. Pharmacoepidemiol Drug Saf. 2009;18:1150-57
15. Adedapo HA, Lawal AO, Adisa AO, Adeyemi BF. Non-doctor consultations and self-medication practices in patients seen at a tertiary dental center in Ibadan. Indian J Dent Res. 2011 Nov-Dec;22(6):795-8.
16. Agbor MA, Azodo CC. Self medication for oral health problems in Cameroon. Int Dent J. 2011 Aug;61(4):204-209.
17. Sen Tunc E, Aksoy E, Arslan HN, Kaya Z. Evaluation of parents' knowledge, attitudes, and practices regarding self-medication for their children's dental problems during the COVID-19 pandemic: a cross-sectional survey. BMC Oral Health. 2021 Mar 5;21(1):98.
18. Gutema GB, Gadisa DA, Berhe DF, Berhe AH, Hadera MG, Hailu GS, *et al*. Self medication practices among health sciences students: the case of Mekelle university. J Appl Pharm Sci. 2011;1(10): 183- 189.
19. Tripkovic K, Neskovic A, Jankovic J, Odalovic M. Predictors of self-medication in Serbian adult population: cross-sectional Study. Int J Clin Pharm. 2018; 40(3): 627-634.
20. Mainous AG, 3rd, Diaz VA, Carnemolla M. Factors affecting Latino's use of antibiotics for self-medication. J Am Board Fam Med. 2008;21:28–34.

21. Geissler PW, Nokes K, Prince RJ, Odhiambo RA, Aagaard-Hansen J, Ouma JH. Children and medicines: Self-treatment of common illnesses among Luo schoolchildren in western Kenya. SocSci Med. 2000;50:1771-83.