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**Research Article**

# ASSESSMENT OF PHARMACISTS' ORAL HEALTH ADVICE USING "BY PROXY" AND QUESTIONNAIRE METHODS – A COMPARATIVE STUDY

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**ABSTRACT**

The aim of the study was to assess and compare the pharmacists' oral health advice using 'By Proxy' method and Questionnaire in Udaipur city, Rajasthan, India. A descriptive cross sectional survey was conducted among the pharmacists of Udaipur city for 3 months. Study population consisted of randomly selected 50 pharmacist outlets of Udaipur city. Pre-trained simulated clients visited the selected pharmacy shops who enquired about different oral problems, and the pharmacists' responses were recorded. A structured self-administered questionnaire was used regarding the same oral problems for the same pharmacy outlets. For both methods, responses were analyzed using descriptive statistics. Majority of the pharmacists prescribed analgesics (54%), followed by antibiotics (31%) for tooth related problems to the proxy clients and for the questionnaire survey also, majority opted for analgesics (44%) & antibiotics (32%). It was found very few (6%) recommended the proxy clients to visit dentist and slightly more pharmacists (26%) did the same by questionnaire method. The study results concluded that pharmacists provided irrational and erroneous oral health advice depicting a callous approach in the 'By Proxy' method while their responses were biased, comparatively correct through Questionnaire method. They were found to have inadequate knowledge and most did not recommend to visit dentist. Hence, Pharmacists' proper education regarding medicines should be considered as a serious measure to reduce harms to the patients.



## INTRODUCTION

An integral part of good health and quality of life is oral health, while dental science is the practice of diagnosis, treatment and prevention of oral disease and conservation of oral health. The medications prescribed to the common people by health professionals in various oral health problems ought to be proper with correct instructions about dosage, duration, side effects. A global rising trend has been observed about the role of pharmacists in delivering oral healthcare in the recent years, apart from health professionals (Ghalamkari *et al*, 1997). Due to their easy accessibility & knowledge, community pharmacists are considered as expert members of the health care professionals team since a long time, and are frequently approached by the public to answer health-related questions (Iwanowicz *et al*, 2006). They are in the frontline to disseminate information on oral health in developing countries (Maunder *et al*, 2005, Bawazir *et al*, 2014). They can emphasize the nature of dental disease, its prevention, and importance of regular dental checkups. Even though they cannot take over the role of dental professionals, they can endorse the advice given by them. Attempts were made in the past years by the department of health, so that community pharmacists' role could be enhanced in improving primary care services (Maunder *et al*, 2005). Based on the outcome of several studies, the importance of training for the pharmacists was stressed so that they get information on existing dental

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services (Anderson, 1998, Chestnutt *et al*, 1998, Al-Hassan, 2009, Priya *et al*, 2008).

Studies on dental care advice, products, and information provided by community pharmacists (Chestnut *et al*, 1998, Priya *et al,* 2008) found that they could perform a better role in oral health care through support and education from dental practitioners. The fact that pharmacists were required to be included in a multidisciplinary oral healthcare team, was put into light by another study (Anderson, 1998).

The reality that pharmacists do not have proper knowledge about drugs for dental problems and do not refer patients to dentists have already been proven in several studies (Bawazir *et al,* 2014, Prakash *et al,* 2016, Svitlana and Jayalakshmi, 2016, Priya *et al*, 2008). Majority of the studies were questionnaire based (Bawazir *et al,* 2014, Svitlana and Jayalakshmi, 2016, Priya *et al*, 2008) but in a study (Prakash *et al*, 2016), pre-trained simulated clients (by proxy method) were sent to different pharmacy shops in Davangere city with dental complaints and the conversations with the pharmacists have been recorded and later, analyzed.

It is a general notion that people tend to reply casually rather than being mindful, when someone asks about a matter just verbally, while people respond after a mature thought process, when they are aware that are part of a survey. This truth applies to the pharmacists as well, that they may respond in a careless and offer better oral health advice through questionnaire.

Due to dearth of literature, more research is a necessity to study the variations in responses of pharmacists using different approaches. Hence, the current study was conducted with the aim to compare the pharmacists' oral health advice provided using 'By proxy' method and questionnaire in Udaipur city.

***Aim***

To assess and compare the pharmacists' oral health advice using 'By Proxy' method and Questionnaire in Udaipur city, Rajasthan, India.

***Objectives***

1. To assess the pharmacists' oral health advice using 'By Proxy' method in Udaipur city, Rajasthan, India
2. To assess and compare the pharmacists' oral health advice using Questionnaire in Udaipur city, Rajasthan, India

## MATERIALS AND METHODOLOGY

***Study Design, Study Area and Population***

A descriptive cross sectional survey was conducted among the pharmacists of Udaipur city from January-March 2017. Study population consisted of randomly selected 50 pharmacist outlets of Udaipur city.

***Ethical approval & Official Permission***

The study protocol was reviewed and approved by the Institutional Review Board of Pacific Dental College & Hospital and was granted ethical clearance. An official permission was taken before conducting the study from the Principal of the dental college. Written informed consent was obtained from participants after explaining the nature and purpose of research while conducting the survey using questionnaire. The study design using proxy clients did not permit to seek informed consent to avoid the social desirability bias.

***Pretesting of Questionnaire***

Questionnaire was administered to 10 pharmacists, twice on successive days, who were interviewed to gain feedback on the overall acceptability of the questionnaire in terms of length, language clarity, time and feasibility of pharmacists completing and returning it. Based on their feedback, the questionnaire did not require any corrections. Cronbach's coefficient was found to be 0.80, which showed an internal reliability of the questionnaire. Mean Content Validity Ratio (CVR) was calculated as 0.87 based on the opinions expressed by the panel of six academicians. Face validity was also assessed and it was observed that 92% of the participants found the questionnaire to be easy.

***Questionnaire***

A structured self-administered questionnaire written in English was used, which consisted of demographic data (age, gender, educational qualification) and 6 closed ended questions regarding the medication provided for the respective chief complaint (tooth ache, toothache with sensitivity, bad breath, bleeding gums, ulcers, toothache with fever, toothache with swelling, burning sensation), drug dosage, duration, side effects, any other instructions and referral to dentist.

***Pilot Study***

A pilot study was conducted to ascertain the feasibility of the study and to train the simulated clients by visiting 2 pharmacies near the hospital. A mock drill of the body language, dressing, tone, and tenure with voice modulation on how to ask for medicines was done in pairs for simulated clients well before they reached the pharmacy.

## METHODOLOGY

List of all pharmacy outlets in Udaipur city was obtained from the Department of Health. Slightly more than 20% of the population was chosen to compensate for non-response. A total of 50 outlets were selected from a group of 210 retail pharmacy outlets in Udaipur city using table of random numbers.

Para-dental staff and undergraduate students acted as simulated clients. They were trained before and during pilot study. They presented a fictional scenario of oral problems and visited the selected pharmacy outlets. Three simulated clients (22 years) described severe tooth ache since 3–4 days; Two (55 years) described toothache with tooth sensitivity after having cold or hot food since few days; a 24 year old client described severe tooth ache since 15 days and fever since 3 days; A 25 year old one complained of bleeding gums while brushing; three (22 years) complained of ulcer in mouth since 3-4 days with pain; one(50 years) complained of burning sensation while having food; another aged 22 years complained of bad breath. When simulated clients did not get full information, they elicited answers with additional questions such as (a) How many times to take the drug in a day? (b) How many days it has to be used? (c) Are there any side effects of this drug? (d)Is there any other instruction to be given? (e) Do I have to visit the Dentist? They purchased the drugs dispensed by the pharmacists which were later evaluated for the type of the drugs provided. Conversation

between the clients and pharmacists was recorded in mobile phones by simulated clients without the knowledge of pharmacists. Later, the audio recordings were scrutinized to ascertain the exact content of conversation. Required data was collected, which was later sorted & tabulated.

Multiple investigators visited the same selected pharmacy outlets with questionnaire, those which were visited by the simulated clients previously, personally on convenient dates. One pharmacist from each selected pharmacy participated in the study. Purpose of the study was explained, instructions were given about filling of the questionnaire and any doubts were clarified. Each pharmacist took around 15 minutes to complete the questionnaire. The completed questionnaires were collected by the investigators themselves, and checked carefully for their completeness.

***Statistical Analyses***

The audio recordings were scrutinized and answers to the same questions as those in the questionnaire were sorted, coded & compiled. Also the completed questionnaires were coded, compiled and both were entered in a spreadsheet computer program (Microsoft Excel 2013) and then exported to data editor page of Statistical Package of Social Sciences-SPSS version 20.0 (SPSS Inc., Chicago, Illinois, USA) and analyzed. Descriptive statistics included computation of frequencies and percentages.

## RESULTS

**Figure 1** shows the distribution of medications dispensed by pharmacists regarding dental problems to proxy clients and through questionnaire. It was observed that analgesics and antibiotics were provided to both the proxy population and those who used questionnaire with the chief complaints of toothache, toothache with swelling and toothache with fever. Among these, majority gave painkillers (85.7%) for toothache, antibiotics (66.7%) for toothache with swelling and antibiotics (33.3%) & analgesics (66.7%) for toothache with fever to the proxy clients whereas, majority had given antibiotics (60%) for toothache, painkillers (66.7%) for toothache with swelling and painkillers (66.7%) again for toothache with fever. For the proxy clients complaining of toothache with sensitivity, majority respondents provided desensitizing toothpaste (50%), followed by painkillers (25%) & mouthwash (25%), while maximum of the study subjects gave desensitizing toothpaste (66.7%) & desensitizing mouthwash (33.3%) when surveyed using questionnaire.

**Figure 2** shows the distribution of medications dispensed by pharmacists regarding oral problems to proxy clients and through questionnaire. The study findings depicted that majority of the pharmacists opted for toothpaste (50%), followed by mouthwash as the treatment of bad breath in case of the proxy clients, while the study population equally chose toothpaste and mouthwash (50%) for the survey. The proxy population was given mainly gum paint (49.9%), followed by Vitamins (33.3%) & mouthwash (16.7%) for treating bleeding

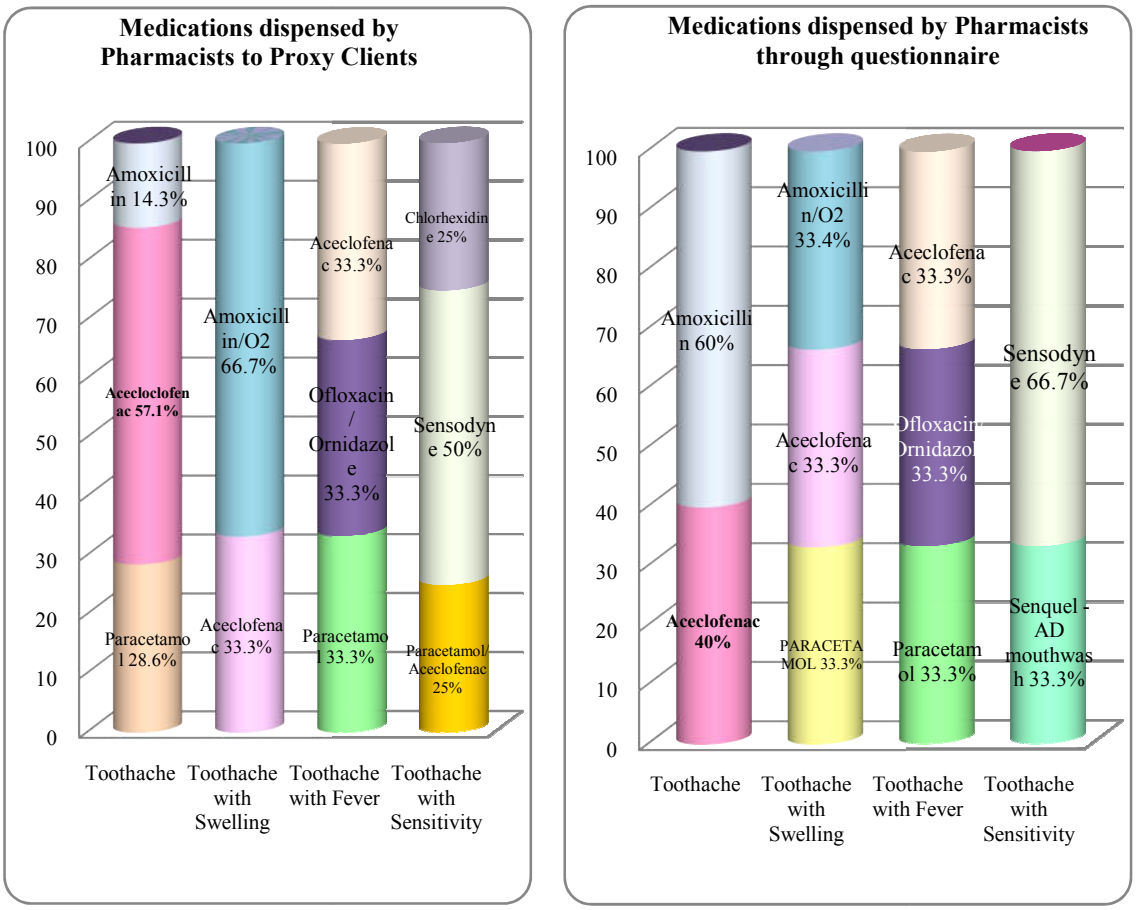


**Figure 1** Distribution of Medications Dispensed by Pharmacists regarding Dental Problems to Proxy Clients and through Questionnaire

gums, whereas, gum paint was opted only by 33.3% pharmacists through the questionnaire. Majority of the study subjects provided steroid ointment (33.3%) & glycerine (33.3%) for oral ulcers, while answers were steroid ointment (50%) & analgesic gel (50%) for the survey. Clients with complaint of burning sensation were prescribed steroid ointment (33.3%), analgesic gel (33.3%), few gave vitamins (16.7%) & mouthwash (16.7%) also, and study population's response was only steroid ointment (50%) & analgesic gel (50%) when answered our questionnaire.

**Figure 3** shows the distribution of medicine groups prescribed by pharmacists regarding dental problems to proxy clients and through questionnaire. It was found that overall, majority of the pharmacists prescribed analgesics (54%), followed by antibiotics (31%) for tooth related problems to the proxy clients and for the questionnaire survey also, majority opted for analgesics(44%) & antibiotics (32%).

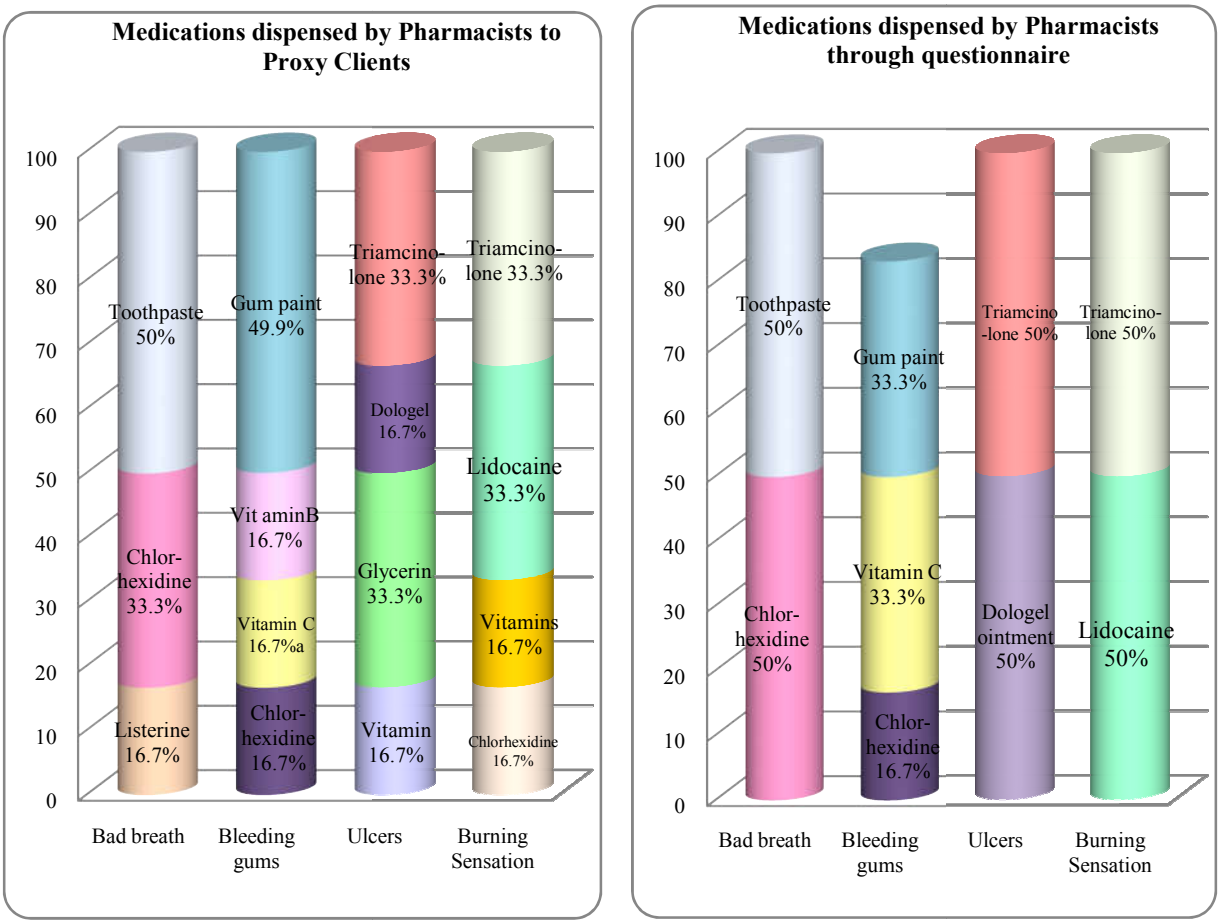


**Figure 2** Distribution of Medications Dispensed by Pharmacists regarding Oral Problems to Proxy Clients and through Questionnaire

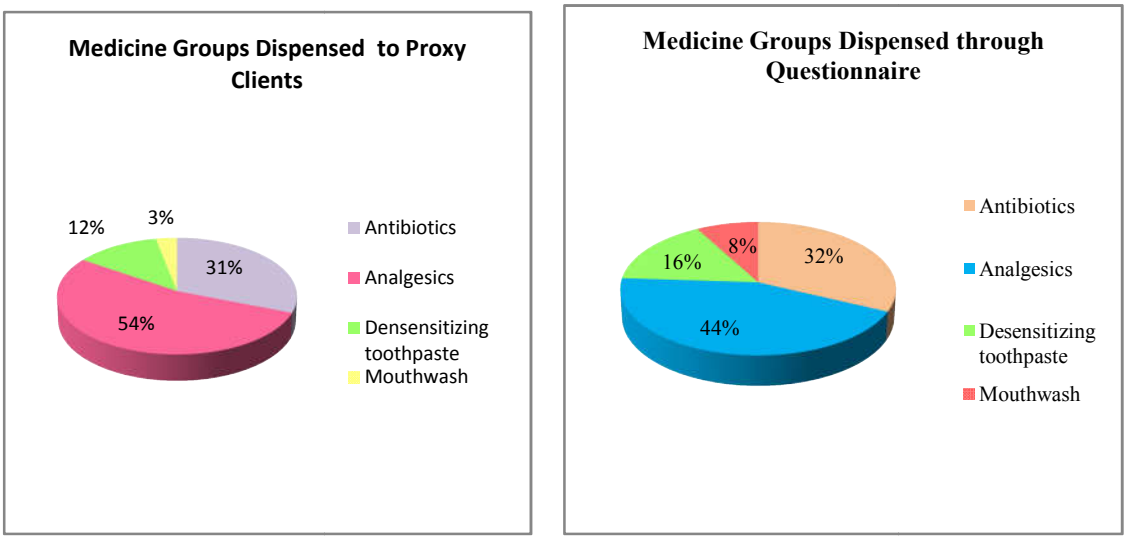


**Figure 3** Distribution of Medicine Groups Dispensed by Pharmacists regarding Dental Problems to Proxy Clients and through Questionnaire

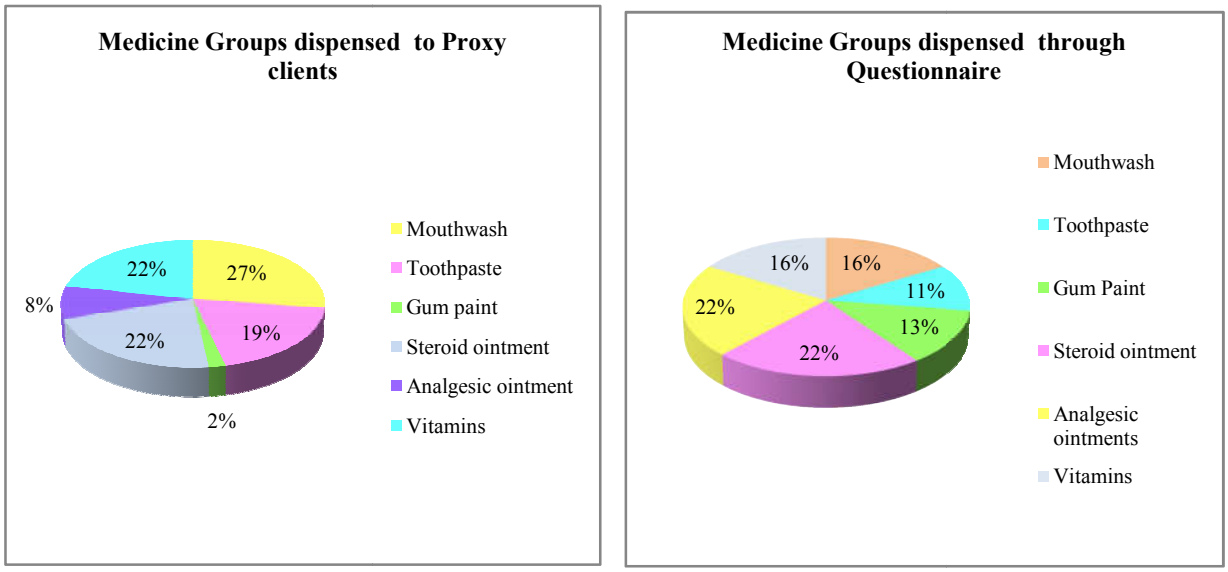


**Figure 4** Distribution of Medicine Groups Dispensed by Pharmacists regarding Oral Problems to Proxy Clients and through Questionnaire

**Figure 4** shows the distribution of medicine groups prescribed by pharmacists regarding oral problems to proxy clients and through questionnaire. The findings depict that most of the pharmacists prescribed mouthwash (27%), steroid ointment (22%) & Vitamins (22%), followed by toothpaste (19%), analgesic ointment (8%) and Gum paint (2%). When questioned under a survey, study population chose mainly steroid ointment (22%), Analgesic ointment (22%) followed by mouthwash (16%), Vitamins (16%), Gum paint (13%) & toothpaste (11%).

**Table 1** shows the distribution of Pharmacists' response regarding recommendation to visit dentist using Proxy and Questionnaire methods. It was found very few (n=3, 6%) recommended the proxy clients to visit dentist and slightly more pharmacists (n=13, 26%) did the same by questionnaire method.

**Table 1** Distribution of Pharmacists' response regarding recommendation to visit dentist using Proxy and Questionnaire methods

| Chief Complaints | Proxy Clients | | Questionnaire | |
|---|---|---|---|---|
| | Yes N (%) | No N (%) | Yes N (%) | No N (%) |
| Toothache | 1 (14.3) | 6 (85.7) | 2 (28.6) | 5 (71.4) |
| Toothache with sensitivity | 0 | 7 (100) | 1 (14.3) | 6 (85.7) |
| Bad breath | 0 | 6 (100) | 2 (33.3) | 4 (66.7) |
| Bleeding Gums | 0 | 6 (100) | 2 (33.3) | 4 (66.7) |
| Ulcers | 1 (16.7) | 5 (83.3) | 2 (33.3) | 4 (66.7) |
| Toothache with swelling | 1 (16.7) | 5 (83.3) | 1 (16.7) | 5 (83.3) |
| Toothache with Fever | 0 | 6 (100) | 2 (33.3) | 4 (66.7) |
| Burning Sensation | 0 | 6 (100) | 1 (16.7) | 5 (83.3) |
| TOTAL | 3 (6.0) | 47 (94.0) | 13 (26.0) | 37 (74.0) |

**Table 2** shows the distribution of Pharmacists' response regarding side effects of drugs dispensed using Proxy and Questionnaire methods. Results showed that majority (n=24, 48%) of the pharmacists did not inform the proxy clients about drug side effects and did not know about it also. For the questionnaire survey, similarly, majority (n=22, 44% & n=24, 48%) did not instruct about the various side-effects and did not have knowledge too.

**Table 2** Distribution of Pharmacists' response regarding information about side effects of drugs dispensed using Proxy and Questionnaire methods

| Chief Complaints | Proxy Clients | | | Questionnaire | | |
|---|---|---|---|---|---|---|
| | Yes N (%) | No N (%) | Don't Know N (%) | Yes N (%) | No N (%) | Don't Know N (%) |
| Toothache | 0 | 7 (100) | 0 | 0 | 1 (14.3) | 6 (85.7) |
| Toothache with sensitivity | 2 (28.6) | 2 (28.6) | 3 (42.9) | 2 (28.6) | 0 | 5 (71.4) |
| Bad breath | 0 | 0 | 6 (100) | 0 | 2 (33.3) | 4 (66.7) |
| Bleeding Gums | 0 | 3 (50.0) | 3 (50.0) | 0 | 5 (83.3) | 1 (16.7) |
| Ulcers | 0 | 0 | 6 (100) | 1 (16.7) | 5 (83.3) | 0 |
| Toothache with swelling | 0 | 0 | 6 (100) | 0 | 0 | 6 (100) |
| Toothache with Fever | 0 | 6 (100) | 0 | 0 | 4 (66.7) | 2 (33.3) |
| Burning Sensation | 0 | 6 (100) | 0 | 1 (16.7) | 5 (83.3) | 0 |
| TOTAL | 2 (4.0) | 24 (48.0) | 24 (48.0) | 4 (8.0) | 22 (44.0) | 24 (48.0) |

Table 3 shows the distribution of Pharmacists' response regarding any other instructions to be provided to patients using Proxy and Questionnaire method. None of the pharmacists told about any other instructions to be followed to the simulated clients while few (n=3, 6%) of them answered 'Yes' when questioned.

**Table 3** Distribution of Pharmacists' response regarding any other instructions to be provided to patients using Proxy and Questionnaire methods

| Chief Complaints | Proxy Clients | | | Questionnaire | | |
|---|---|---|---|---|---|---|
| | Yes N (%) | No N (%) | Don't Know N (%) | Yes N (%) | No N (%) | Don't Know N (%) |
| Toothache | 0 | 1 (14.3) | 6 (85.7) | 0 | 1 (14.3) | 6 (85.7) |
| Toothache with sensitivity | 0 | 6 (85.7) | 1 (14.3) | 0 | 5 (71.4) | 2 (28.6) |
| Bad breath | 0 | 0 | 7 (100) | 1 (16.7) | 0 | 5 (83.3) |
| Bleeding Gums | 0 | 0 | 6 (100) | 0 | 5 (83.3) | 1 (16.7) |
| Ulcers | 0 | 0 | 6 (100) | 1 (16.7) | 5 (83.3) | 0 |
| Toothache with swelling | 0 | 0 | 6 (100) | 0 | 0 | 6 (100) |
| Toothache with Fever | 0 | 0 | 6 (100) | 0 | 0 | 6 (100) |
| Burning Sensation | 0 | 6 (100) | 0 | 1 (16.7) | 5 (83.3) | 0 |
| TOTAL | 0 | 13 (26.0) | 38 (76.0) | 3 (6.0) | 21 (42.0) | 26 (52.0) |

## DISCUSSION

Teamwork is now predictable as a key idea in the delivery of oral health care. Although this is most often discussed in the context of members of the 'dental team,' this role is also played by pharmacists and has expanded significantly in recent decades from distributor of medication to known member of the health care team. Pharmacy is a dynamic profession and pharmacists are frequently approached by consumers with health related questions (Watson *et al*, 2002). Studies have reported that pharmacists are the second most used source for advice on general health matters and, therefore, can and should also be used in an oral health capacity (Ghalamkari *et al*, 1997, Goel *et al*, 1996). Rather than consult a dentist or physician, many individuals with oral problems seek help from their pharmacists.

Our study showed that a small percentage of the study population recommended visiting the dental practitioners through questionnaire (26%) and simulated client method (6%), which is in accordance with other study findings (Maunder and Landes, 2005, Hamissi and Hamissi, 2015).

In our research, an alarming observation was that the proxy clients were dispensed medicines by all the pharmacists (100%) without any authorised prescription, and thereafter, majority (94%) did not refer to dentist which is in accordance with a study (Svitlana *et al*, 2016). Studies (Hamissi and Hamissi, 2015, Bawazir, 2014) showed contrary findings that 7% and 13 % of the pharmacists did not refer their patients to dentist respectively. This is a matter of concern since short-term pain relief might mean that the patient will postpone consulting a dentist and, thereby, an opportunity to diagnose a disease in its early stage may be lost.

Our study showed that only 4% and 8% of the pharmacists instructed the proxy study subjects and the survey investigators about side effects of drugs dispensed respectively, whereas, another study (Prakash *et al*, 2016) depicted a lesser percentage (1.4%) of the pharmacists approached by the simulated clients, gave instructions about side-effects.

To the best of our knowledge, this study is the first one of its kind comparing the responses of pharmacists of a common group of selected pharmacy outlets by proxy method and through questionnaire. Our questionnaire survey, which was a direct interview, was conducted to assess the type of medication and oral health advice provided, and it was obvious that there was a high tendency for them to answer in a manner that would be viewed favourably by the investigator leading to social desirability bias. Social desirability is the resultant of two factors: Self‑deception and others deception. So, we also employed proxy subjects' method by training the simulated clients as also done (Van Sickle, 2006, Amidi *et al*, 1978).

The results of our study clearly depicted that the pharmacists' responses were biased, as for the same population, majority (94%) did not instruct to visit dentist when asked verbally by simulated clients and through questionnaire, lesser (74%) portion of the same study population did not recommend to visit dentist. Similarly, 4% and none of the pharmacists provided information on the side effects and other oral hygiene instructions respectively to the proxy clients, while a higher percentage, 8% and 6% of the pharmacists told about the side-effects and other instructions when questioned through a survey.

Social desirability bias was also evident in case of the dispensed medications in both the methods. It was an interesting finding of this study, that pharmacists had a tendency to provide proper drugs when approached by an investigator as a part of survey, while the same population provided other inappropriate drugs for the same oral complaints. Chlorhexidine mouthwash was given to the proxy clients with complaint of toothache with sensitivity, whereas, desensitizing toothpaste and desensitizing mouthwash were dispensed when using questionnaire. Simulated clients were advised to apply glycerine to ulcers, while proper medicines (steroid and analgesic ointments) were given when questioned. Also, Chlorhexidine mouthwash was advised for burning sensation in proxy settings, while steroid and analgesic ointments provided in the other method. This is a very deceptive and dangerous condition which our study detected, that pharmacists provided correct medicines and instructions consciously when knowing about the survey and advising improper medication & instructions to patients when uninformed. This plainly points towards the insensitive attitude of the pharmacists in the given study setting.

Overall pharmacists dispensed correct medicines but wrong drug advise and incorrect directions for usage were a common finding in the study such as Vitamin B complex for bleeding gums, antibiotics for 1-2 days, analgesics should be taken in empty stomach, desensitizing agents for 3 months, glycerine for ulcers, mouthwash for burning sensation, to use mouthwash with hot water. Side effects on long term use of mouthwash like staining of teeth and altered taste sensation, gastric effects of analgesics & antibiotics, were never disclosed to consumers. Similar findings were also reported in a study (Prakash *et al*, 2016) where pharmacists gave the same kind of incorrect instructions.

Pharmacists mostly dispensed analgesics/antipyretics (54% & 44%) and antibiotics (31% & 32%) by proxy method and questionnaire respectively for dental problems in the current research. Dissimilar findings were observed in another study where antibiotics (44.4%) & antipyretics (33.4%) were provided to simulated clients (Anderson, 1998). Again, one other study (Svithlana *et al,* 2016) reported that 90% pharmacy shops advised antibiotics & 100% gave painkillers for dental chief complaints of patients in Chennai.

However, the present study has some limitations. Blinding the study participants in the 'By Proxy' method is a limitation of this study as suggested in The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research by the Department of Health Education and deontological approach. Since no harm was done to the study population, the subjects cannot feel harmed or disrupted (Mill, 1998). But our study design required the comparison of both the methods and the bene ts of the situation overshadowed the potential for harm. Small sample size may be another limitation.

It is recommended that pharmacists strictly should not dispense medicines without proper prescriptions and patients should be referred to dentists. Pharmacists' proper education regarding

medicines should be considered as a serious measure to reduce harms to the patients.

## CONCLUSION

The current study results suggest that pharmacists provided irrational and erroneous oral health advice depicting a callous approach in the 'By Proxy' method while their responses were biased, comparatively correct through Questionnaire method. They were found to have inadequate knowledge about medications used in dental practice related to oral health problems, did not provide sufficient information about drug usage, majority did not recommend to visit dentist and dispensed drugs without prescriptions. Researches on pharmacists' oral health knowledge, attitude and advice should be conducted in a larger scale with similar study design which may open new vistas in future.

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