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Original Research

Evaluation of the Knowledge and Practices About Drug Prescribing and Adverse Reaction Reporting Among Turkish Dentists

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ABSTRACT

Objectives: The purpose of this study was to assess dental care professionals' drug prescription knowledge, practices, and reporting of adverse drug reactions (ADRs).

Methods: A cross-sectional exploratory study was conducted by using a face-to-face survey administered to a sample of dentists from tertiary care hospitals in Adana, Türkiye. A questionnaire consisted of six sections with closed-ended items including sociodemographic characteristics, knowledge about drugs, patient history information, counseling practices during prescribing, source of information and ADR reporting.

Results: The study included 180 dentists, with a 95.3% response rate. More than half of the dentists (50.6%) stated their level of knowledge about drug price/cost as low. Most of the dentists (50.6%;n=91) claimed that they never/rarely asked about health insurance during patient history information. Moreover, most of the participants reported that they never/rarely and sometimes counsel the patients regarding drug mechanism of action, side effects of the drug, interaction of prescribed drug with other drugs/nutrients. It was determined that the dentists learned about the drugs from Vademecum (Turkish Medication Guidebook: 70%;n=126) and the internet (55%;n=99). A higher proportion (85.5%) of the dentists indicated that they did not report ADR during their clinical practice.

Conclusion: This study showed a general improvement in dentists prescribing knowledge and practices, although they reported some lack of knowledge regarding drug cost, discussion about the possible side effect of a drug/interaction with other drugs/nutrients with patients and under-reporting of ADRs. Periodic education and training for dentists are critical to overcoming any problem related to prescribing errors and potential ADRs.

Keywords: Prescribing; adverse drug reactions; dentists; hospital, oral health; survey.

INTRODUCTION

The World Health Organization (WHO) states that prescriptions should include the identity of the professional, the patient receiving a drug, administration mode, the pharmaceutical form, dosage details, the frequency of usage, treatment duration, and any instructions or information for the patient(1). Errors in medical prescriptions should be avoided at all costs, as they can lead to not only difficulties and errors in medication dispensing, and improper drug use that can reduce the efficacy and safety of treatments and also increase the risks and healthcare costs(2).

Dentists typically prescribe medications to alleviate pain and/or combat infection(3). Dentists treat any condition that affects oral health by making specialized clinical decisions that combine surgical/operative interventions and medications(4). They play a crucial role in delivering high-quality dental care and individualized high-quality medication use(3,4). As a result, to choose the best treatment choice for each patient, dentists must constantly advance their understanding of medications, including side effects, contraindications, and interactions(2-4).

Patients' health and quality of life may suffer as a result of dentists' lack of knowledge about side effects, indications, and contraindications(5,6). It is reported that previous studies carried out around the globe documented many prescription errors including incorrect drugs, dosage regimens, duration of treatment leading to antimicrobial resistance, prolong hospitalization, and adverse patient outcomes(6). Additionally, dental doctors pre-

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scribe a variety of therapeutic interventions, including allopathic medicines like local anesthetics, analgesics, antibiotics and anti-inflammatory drugs. It is indicated that the use of antibiotics and analgesics is one of the most typical causes of adverse events. Therefore, the risk of adverse drug reactions (ADRs) in dentistry cannot be ignored, and dentists' contributions to improving the spontaneous reporting of ADRs cannot be undervalued(7).

Increased unnecessary pharmaceutical spending and costs are thought to be primarily the result of irrational prescribing practices, especially in countries with already overburdened healthcare systems like Türkiye(8). Despite the dentist's critical role in patient safety, pharmacovigilance and ADR reporting are the least understood and practiced in dentistry(9). To the best of our knowledge, studies assessing knowledge, counseling practices regarding prescribing, and adverse drug reaction reporting among Turkish dental care providers are scarce. Therefore, the main objective of our study was to evaluate the drug-prescribing knowledge and practices, as well as adverse drug reaction reporting among dental care practitioners in Adana, Türkiye.

METHODS

A cross-sectional exploratory study was conducted between 10 July to 10 November 2018 using a face-to-face survey administered to a sample of dentists from two tertiary care hospitals in Adana, Türkiye. Full-time registered dentists with at least one year of work experience in two tertiary care hospitals were included in this study. Healthcare students on a traineeship and part-time registered dentists, who had less than 1 year of work experience and were unwilling to participate were excluded.

As per hospital data, there were 105 working dentists in Fatma Kemal Timuçin Oral and Dental Health Hospital and 84 in Cukurova University Dental Faculty Hospital during the study period. The study was approved by the Ethical Committee of Cukurova University, Adana, Türkiye (Meeting number 79, decision number 43, dated 06-07-2018) ***(Supplementary file 1).*** We entered this information into the Epi Info™ software (Centers for Disease Control and Prevention, Epi Info™) and calculated a minimum of 127 participants, considering a hypothesized % frequency of outcome factor in the population of 50%, a confidence interval of 95%, and a design effect of 1(10). To ensure reliability, the sample size was increased to all 189 participants to account for any missing data or non-response rate.

A self-reported questionnaire was created for this study based on a review of prior literature (2,4,7). The questionnaire was first developed in Turkish (the official native language of Türkiye), then it was translated into English and then back into Turkish by two academic researchers. Before beginning data collection, Turkish versions were pilot tested on a sample of ten dentists. The few translation inconsistencies that were found in the pilot study were corrected by the investigators. Participants were interviewed face-to-face to gather data.

The final questionnaire consisted of six different sections: 1) socio-demographic and general information (gender, age, professional title, experience and prior training on rational drug use); 2) questions related to drug knowledge was calculated by using "very bad, bad, medium, good, very good" type choices 3) questions about patient history taking information and these questions were measured by using Likert scale "never, rarely, sometimes, often, always " types options; 4) questions related to patient counseling also measured by using Likert scale "never, rarely, sometimes, often, always" types options; 5) multiple choice questions about the source of information, and 6) questions related to adverse drug reporting was measured by using multiple-choice items ***(Supplementary file 2).*** The final data were collected and transferred to Microsoft Excel 365 (Version 2016, Microsoft Corporation, United States) and the findings were recorded in number and percentage form. The final results were presented in tabulated form.

RESULTS

In this study, a total of 189 dentists were approached. Nine (4.7%) were excluded due to lack of time (4; 2.1%) and less than 1-year of working experience (2.6%). Finally, a total of 180 dentists were included with a response rate of (95.3%). Females (n=97; 53.4%) were more than males (n=83; 46.2%) with a mean age of 35.4 years. The majority of the dentist were general dental practitioners (n=101; 56.1%) followed by the assistant dentist. Out of the total, 68.3% (n=123) claimed to obtain prior training on "rational drug use".

In this study, various knowledge-related variables to drugs were asked from the participants. This study showed a general improvement in dentists prescribing knowledge. However, 50.6% (n=91) indicated their knowledge level as a bad and very bad category regarding drug price/cost (Table 1).

The majority of the dentists reported that they always asked about the drug(s)/medicinal product used by patients, drug-related allergy, chronic disease, previous or current bleeding problems, pregnancy, or breastfeeding. However, more than half (50.6%; n=91) of the dentists claimed that they never/rarely asked about health insurance. In terms of counseling-related techniques, most of the participants reported that they often/always asked about important information. However, drug mechanism of action, the possible side effect of the drug, drug price, the interaction of prescribed drug with other drugs and nutrients, and any other drug warnings were never/rarely and sometimes explained by the dentists (Table 2).

The majority of the participants (95%; n=171) claimed that the drug information provided by them to patients is adequate and satisfactory. Vademecum (Turkish Medication Guidebook: 70%; n=126) followed by the internet (55%;n=99) was the main source of information used by the dentist for drug information purposes. Vademecum is a Book, which has been supporting healthcare professionals since 1987 and is a limited edition of the Vademecum database. Vademecum Medication Guide, published every year, is updated by adding newly licensed drugs from the Ministry of Health(11). About 2.8% (n=5) and 19.4% (n=35) of the respondents agreed that they prescribe medications (yes and partially) that are requested by patients (Table 3). Most of the dentists (57.8%) indicated that the adverse effects/reactions due

to the medicines and medical products should be reported. The majority of the participants reported that hospital pharmacovigilance officers (57.7%) followed by the pharmacovigilance center of Türkiye (24.4%) are responsible for ADR reporting and monitoring. However, a higher proportion (85.5%) of the dentists indicated that they did not report ADR during their clinical practice. Further details are listed in (Table 3).

DISCUSSION

Good drug-prescribing knowledge and practices are the most important indicators of quality healthcare service(12). Scientific evidence-based correct drug indications and a properly filled out prescription are critical parameters of quality pharmacotherapy delivery(2). In the current study, most of the claimed that they had sufficient knowledge related to drug pharmacology and pharmacotherapy items. A similar finding was also reported by the study conducted in Lebanon(4). However, more than half of the participants indicated that they had poor knowledge regarding drug price/cost. This finding was consistent with a United States study(13). A study conducted in Ireland observed that 88% of the prescribers stated that they were frequently unaware of actual drug costs(14). Another study conducted in Nigeria found that only 6.2% and 12% of respondents had accurate estimated costs for generic and originator brands, respectively(15). It is reported that inadequate prescribing knowledge of drug costs may harm patient outcomes and national drug budgets(14). It is recommended that the topic of cost awareness should be better covered in pharmacotherapy education because it is crucial for therapeutic reasoning and cost-effective prescribing(16).

In this study, most of the dentists reported that they always asked for important patient history information before prescribing medication. However, more than half of the dentists had never/rarely asked about health insurance. According to a Nigerian study, physicians' prescribing practices are influenced to some extent by their patients' health insurance status(17). Healthcare insurance is a type of healthcare financing that encourages the prudent use of resources and ensures the cost-effectiveness of interventions through the use of low-cost drugs(17). In Türkiye, healthcare is a mix of public and private health services. In 2003, Türkiye implemented universal health care. It is known as Universal Health Insurance [Genel Sağlık Sigortası (SGK)] and is funded by a 5% tax surcharge on employers. Approximately 75.2% of health expenditures are covered by the public sector(19). Additional training on the rational use of medications is required for all prescribers, particularly also for those who care for this group of patients.

In terms of counseling-related techniques, most of the participants reported that they never/rarely and sometimes counsel the patients regarding drug mechanism of action, the possible side effect of a drug, interaction of prescribed drug with other drugs and nutrients. A similar finding was also reported in a recently published study(4). Oral health is an important component of general health because it influences physical health, mental health, quality of life, and overall well-being(19). Clinical professionals must be up-to-date on their knowledge regarding new medications, drug interactions, and practical therapeutic trends due to the rapid advancement of dental pharmacotherapeutics(20). Dentists must need to have a deeper understanding of the relationship between themselves and their patients as well as a conscious awareness of the potential role of counseling to be able to provide truly holistic care(21). It is advised that dentists continually increase their understanding of drugs' side effects, contraindications, and interactions as well as their clinical proficiency to determine the best course of action for each patient.[4] Therefore, research that focuses on evidence-based practice in the use of counseling related to dentistry is urgently needed(21).

Table 1. Participants' Knowledge of Drugs

Knowledge Variables	Very bad	Bad	Medium	Good	Very Good
Indications	10 (5.6)	4 (2.2)	38 (21.1)	90 (50)	38 (21.1)
Posology and method of application	10 (5.6)	14 (7.8)	43 (23.9)	85 (47.2)	28 (15.6)
Pharmacological properties	11 (6.1)	21 (11.7)	78 (43.3)	59 (32.8)	11 (6.1)
Contraindications	11 (6.1)	10 (5.6)	63 (35)	78 (43.3)	18 (10)
Side Effects	12 (6.7)	9 (5)	85 (47.2)	59 (32.8)	15 (8.3)
Interactions of drugs (medicine, nutrients, etc.)	12 (6.7)	21 (11.7)	83 (46.1)	51 (28.3)	13 (7.2)
Warnings, Precautions	12 (6.7)	8 (4.4)	71 (39.4)	72 (40)	17 (9.4)
Special situations (pregnancy, breastfeeding, special age groups, etc.)	9 (5)	5 (2.8)	39 (21.7)	87 (48.3)	40 (22.2)
Bioequivalence	19 (10.5)	25 (13.9)	69 (38.3)	51 (28.3)	16 (8.9)
Drug price/cost	37 (20.6)	54 (30)	49 (27.2)	22 (12.2)	18 (10)

Table 2: Patients' history information and counseling techniques taken by dentists before prescribing medications

Patients' History Information	Never	Rarely	Sometimes	Often	Always
Inquire about other drugs (s)/medicinal product	6 (3.3)	1 (0.6)	9 (5)	33 (18.3)	131 (72.8)
Drug allergy	4 (2.2)	0 (0)	3 (1.7)	26 (14.4)	147 (81.7)
Liver, kidney, heart disease	1 (0.6)	5 (2.8)	5 (2.8)	34 (18.9)	135 (75)
Previous/current bleeding problem	8 (4.4)	6 (3.3)	22 (12.2)	39 (21.7)	104 (57.8)
Chronic disease	0 (0)	4 (2.2)	3 (1.7)	23 (12.8)	150 (83.3)
Surgery	12 (8.9)	11 (6.1)	34 (18.9)	37 (20.6)	82 (45.6)
Pregnancy/breastfeeding	7 (3.9)	6 (3.3)	9 (5)	32 (17.8)	126 (70)
Age	11 (6.1)	3 (1.7)	22 (12.2)	32 (17.8)	112 (62.2)
Gender	30 (16.7)	36 (20)	33 (18.3)	30 (16.7)	51 (28.3)
Health insurance	54 (30)	37 (20.6)	29 (16.1)	23 (12.8)	37 (20.6)
Counseling techniques					
Examine the patient before prescribing a medicine	4 (2.2)	0 (0)	0 (0)	8 (4.4)	168 (93.3)
Causes of illness.	0 (0)	4 (2.2)	14 (7.8)	29 (16.1)	133 (73.9)
Possible course of illness	5 (2.8)	2 (1.1)	14 (7.8)	41 (22.8)	118 (65.6)
Reasons for the treatment	1 (1.6)	5 (2.8)	11 (6.1)	30 (16.7)	133 (73.9)
How the disease can respond to treatment.	6 (3.3)	2 (1.1)	16 (8.9)	30 (16.7)	126 (70)
Possible complications of the disease.	8 (4.4)	2 (1.1)	19 (10.6)	41 (22.8)	110 (61.1)
Name of the drug	11 (6.1)	6 (3.3)	26 (14.4)	51 (28.3)	86 (47.8)
How to apply	11 (6.1)	2 (1.1)	14 (7.8)	47 (26.1)	106 (58.9)
Daily dose	11 (6.1)	3 (1.7)	17 (9.4)	36 (20)	113 (62.8)
Duration of use	14 (7.8)	2 (1.1)	4 (2.2)	38 (21.1)	122 (67.8)
Drug's mechanism of action	40 (22.2)	46 (25.6)	56 (31.1)	22 (12.2)	16 (8.9)
Possible side effects of the drug.	22 (12.2)	34 (18.9)	60 (33.3)	39 (21.7)	25 (13.9)
Price	119 (66.1)	27 (15)	18 (10)	8 (4.4)	8 (4.4)
Interactions with other drugs/nutrients.	38 (21.1)	41 (22.8)	50 (27.8)	31 (17.2)	20 (11.1)
Activities that should be avoided	23 (12.8)	28 (15.6)	53 (19.4)	43 (23.9)	33 (18.3)
Other warnings about drugs.	29 (16.1)	36 (20)	49 (27.2)	41 (22.8)	25 (13.9)
Recommend non-drug treatments to the patient	12 (6.7)	24 (13.3)	52 (28.9)	35 (19.4)	57 (31.7)
Call for a post-treatment check-up	7 (3.9)	10 (5.6)	31 (17.2)	59 (32.8)	73 (40.6)

Table 3. Source of information and adverse drug reaction reporting by the participants

Variables	Frequency	Percentage
Do you believe the drug information you provide the patient is adequate?		
Yes	87	48.3
Partially	84	46.7
No	8	4.4
Sources of information		
I do not benefit from information sources	16	8.9
Türkiye Drug Treatment Guide (TİK)	22	12.2
Diagnosis and Treatment Guidelines	41	22.8
*Vademecum	126	70
Pharmacology Books	30	16.7
Pharmaceutical Information Software Programs	18	10
Research and Promotion Studies of Pharmaceutical Companies	30	16.7
Colleague	72	40
Internet	99	55
Others	4	2.2
Prescribe medications that are requested by patients		
Yes	5	2.8
Partially	35	19.4
No, it's not. I never prescribe medication without examining it	140	77.8
After giving information to the patient about the drugs, would you check if the patient understands		
Yes	105	58.3
Sometimes	66	36.7
No	9	5
Do you think adverse effects caused by the use of medicines and medical products should be reported?		
Yes	104	57.8
No	76	42.2
Did not know	0	0
Which of the following is responsible for ADR reporting and monitoring		
Hospital pharmacovigilance officer	104	57.7
Pharmacovigilance Center of Türkiye (TÜFAM)	44	24.4
Ministry of Health	17	9.4
Pharmaceutical company	9	5
General Directorate of Medicine and Pharmacy	6	3.3
How many adverse events have you reported during clinical practice		
0	154	85.5
1	8	4.4
2	3	1.7
3	1	0.6
4	2	1.1
7	1	0.6
9	1	0.6
14	1	0.6
15	1	0.6

The majority of the participants believed that ADRs due to the use of medicines and medical products should be reported. Most of the participants indicated the hospital pharmacovigilance officer followed by TÜFAM responsible for ADR reporting. However, a high proportion of dentists (85.5%) did not report ADR during clinical practice. Under-reporting behaviors of dentists were also reported in previous studies (7,8,22). Such findings are troubling and need immediate attention. Dental doctors write prescriptions for a variety of therapeutic procedures, including allopathic medications like local anesthetics, antibiotics, analgesics, and anti-inflammatory drugs(7,23). One of the main causes of ADRs is the use of antibiotics and analgesics(7,8,24). Therefore, to enhance patient health care, continuous training modules on the subject of PV and activities such as highlighting the purpose and value of ADR reports are important.

Like any other research, this study had also limitations. First, the present findings may not be generalizable, especially since our study was based on a sample of dentists recruited from a two-hospital in Türkiye. Second, there is the possibility of respondent bias, as in any survey, where respondents choose to have a socially favorable opinion rather than actual answers. Finally, we did not use advanced statistics to make more accurate conclusions about the study variables. However, to reach a more accurate conclusion, we used descriptive statistics as part of our study objectives. Despite these limitations, there had some strengths in this study. This is the first study to assess Turkish dentists' prescribing knowledge and practices with ADR reporting in our healthcare settings. This study also provides baseline local data on dentist prescribing knowledge, practices, and ADR reporting behaviors, and the findings may be useful for clinical settings, healthcare professionals, and policymakers.

CONCLUSION

This study showed a general improvement in dentists prescribing practices knowledge and practices, although they reported some lack of knowledge regarding drug cost, discussion about possible side effects of a drug, interaction with other drugs/nutrients with patients and under-reporting of ADRs. Periodic education and training for dentists are critical to overcoming any problem related to prescribing errors, drug interaction, and potential ADRs.

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Ethics Committee Approval: The study was approved by the Ethical Committee of Cukurova University, Adana, Türkiye (Meeting number 79, decision number 43, dated 06-07-2018).

Informed Consent: Informed consent was obtained from all patients participating in this study

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