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Original Article

Antibiotic prescription in primary care from the perspective of family physicians: a qualitative study

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Abstract

Introduction: Antibiotic consumption increases worldwide steadily. Turkey is now top on the list of global consumption and became a prototype of excessive use of antibiotics. In the last two decades, family physicians (FPs) have become key figures in the healthcare system. This study aims to understand the reasons for inappropriate antibiotic prescribing and elicit suggestions for improving antibiotic use in primary care from doctors themselves.

Methodology: This is a qualitative semi-structured interview study with research dialogues guided by the Vancouver School of interpretive phenomenology. Fourteen FPs from different parts of Turkey were questioned on inappropriate antibiotic prescriptions and their suggestions for improving antibiotic use.

Results: The most important reasons for prescribing antibiotics without acceptable indications were patient expectations, defensive medical decision making, constraints due to workload, and limited access to laboratories. The most remarkable inference was the personal feeling of an insecure job environment of the FPs. The most potent suggestions for improving the quality of antibiotic prescription were public campaigns, improvements in the diagnostic infrastructures of primary care centers, and enhancing the social status of FPs. The FPs expressed strong concerns related to the complaints that patients make to administrative bodies.

Conclusions: Primary care physicians work under immense pressure, stemming mainly from workload, patient expectations, and obstacles related to diagnostic processes. Improving the social status of physicians, increasing public awareness, and the facilitation of diagnostic procedures was the methods suggested for increasing antibiotic prescription accuracy.

Key words: Family practice; qualitative research; antibiotic prescribing; inappropriate use; phenomenology.

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Introduction

Antibiotic consumption rates have increased steadily over the last fifteen years, and the most recent reports show this trend is continuing. Between 2000 and 2015, global antibiotic consumption increased by 65%, from 21.1 billion defined daily doses (DDD) to 34.8 billion DDD [1-5]. In Turkey, total antibiotic consumption was 14.62 DDD per 1000 inhabitants per day in 2001. This value increased to 31.36 in 2006, to 38.8 in 2010, and 42.3 in 2011. In 2019, Turkey was still at the top of global antibiotic consumption [2]. However, while antibiotic consumption steadily increases, there is a parallel growth in antimicrobial resistance rates [3,4]. The reasons for increasing antibiotic consumption in Turkey have not yet been thoroughly evaluated. Some researchers point to the populist health policies established over the last two decades [5,6]. Within the New Healthcare System, FPs in family health centers (FHC) have become the main actors [7-9]. Many antibiotics are prescribed in FHCs, and data shows that the number of visits to physicians has increased year on year (https://www.statista.com/statistics/236589/number-of-doctor-visits-per-capita-by-country). However, the Turkish Ministry of Health has implemented some limitations to reduce the inappropriate prescription of antibiotics, but no reliable result indicates a reduction in rates [3,4]. A few studies have attempted to analyze physician behavior regarding antibiotic prescription in primary care. Still, there have been no qualitative studies related to primary care antibiotic use in Turkey [9-12]. Antibiotic prescribing in primary care deserves thorough evaluation to understand cultural, economic, social, environmental, and organizational dimensions [13,14]. This study is, to our knowledge, the first qualitative study of antibiotic prescription in Turkey.

The experience of Turkey could be an example for other middle-income countries about antibiotic usage policies. The aims of this study are, on the one hand, to understand the relevant factors involved in antibiotic prescription in primary care settings and the barriers obstructing appropriate antibiotic use, and on the other, to gain insights from FPs on potential measures that may improve the quality of antibiotic prescription.

Methodology

As the purpose of the study was to get a better understanding of the lived experience of FPs in daily practice, a phenomenological study methodology was adopted. It was conducted semi-structured, digitally recorded interviews and transcribed them verbatim. The methodological approach of this study was guided by the Vancouver school of doing phenomenology, especially in the collection and analysis of data. This method is an interpretation of phenomenological constructivist thinking. Furthermore, it provides a methodology that can lead to a systematic elucidation of social experiences. It is an exceptional combination of description, construction, clarification, and interpretation of qualitative findings. In phenomenological research, data from limited participants is usually adequate to reach saturation and explain the different habits a phenomenon could be understood, perceived, or experienced [15-18]. In Turkey, primary care is provided by FPs substantially as a public service. FPs in ASMs often work alone or with two or three FPs. Physicians are paid directly by the government; the public health insurance institution provides all subsidies and reimbursements. FPs provide services only during official working hours. Frequently FPs have to refill medications, which are prescribed in emergency departments or by specialists. These services are entirely free of charge. Patients who attend FHCs are registered with a specific doctor and seen by the same doctor each time. Before 2016 there were no official restrictions for purchasing antibiotics without a prescription from community pharmacies. The interview guide was developed by reviewing the literature and using themes arising from focus group discussions (FGDs) with FPs and different medical specialists. The focus group discussions will be published elsewhere. The interviews were conducted by the first researcher, who specialized in Infectious Diseases and Public Health, who worked as a consultant medical doctor, senior researcher, and academic at Dicle University, Diyarbakir, Turkey. He has training and experience in antibiotic use, antibiotic prescription in primary care, antibiotic stewardship, and qualitative research methods. The participants and researcher had no relationship before study commencement. A screening questionnaire was composed to recruit physicians into the study. The interviews were performed at a national Family Medicine Congress in Antalya, Turkey, during 4-7 December 2014. Potential participants were contacted by email and informed about the characteristics of the study before the meeting. Therefore, a quota sample of the congress attendant FPs were called and invited to participate by the researcher. Inclusion criteria were self-reporting full-time medical practice in direct patient contact in a primary care setting for at least three years. Participants were selected from eligible respondents based on a purposive approach, including years and location (geographical and urban/rural setting) of FP practice. Of the 31 participants contacted, 12 were ineligible as they worked as FPs for shorter than three years, and five declined participation. Therefore, the final sample included 14 FPs. Thirteen of them worked in FMCs as family physicians, and one in a private healthcare center outpatient clinic. The qualitative method of an open-ended, face-to-face interview was chosen to ensure candid and truthful answers from participants. All interviews were performed in a small at the congress center. Before the interview, the participants were informed on the study goals and how the data collected was used, followed by written consent. They were then questioned about the practice setting in which they worked and the patient populations they served. During the interview, the interviewer was always neutral about the participants' opinions and did not provide any guidance in the interview, but dug details when some of the participants' explanations were not clear. The participants were encouraged to express their ideas freely. Each interview proceeded through an ordered list of open-ended questions on primary indications for antibiotic prescription in their practice, reasons for inappropriate antibiotic prescription, and their suggestions for improving antibiotic stewardship (for examples of interview questions, see Annex). Fourteen interviews were conducted, each taking between 20 and 25 minutes. Eleven of the participants were male. The interview recordings were anonymized. Thematic coding was used in the analysis to identify themes using the MAXQDA software (Verbi Software, Berlin, Germany). First, key domains and terms were identified. Then, after recurrent reviewing and the progression of essential phrases and words from data sources, a complete list of domains and themes was laid out. After the development of themes, the final analysis and interpretation were carried out. The participants

were from different parts of Turkey. Five were from Istanbul and Bursa, (north-western metropolitan cities), three from eastern Turkey, two from the Black Sea Region in north Turkey, three from central Anatolia, and one from a Mediterranean town. All participants were FPs. The FPs served an average population of 3,780, and the mean number of daily visits/examinations was approximately 58. They reported that about 40% of all patients were diagnosed with respiratory tract infections. Antibiotics were mainly prescribed for respiratory tract infections, urinary tract infections, skin and soft tissue infections, and fever.

Ethics approval and consent to participate

This study was approved by Dicle University, Faculty of Medicine, Diyarbakir, Turkey, Ethics Committee for Non-interventional Clinical Researches (30 May 2014, Decision No: 222). Written consent has been obtained from all participants.

Results

After analyzing the data obtained from the semi-structured interviews and coding it thematically, two main domains were identified. The first domain was "reasons for inappropriate antibiotic prescription in primary care". The second was "suggestions for improving antibiotic prescription in primary care". Six main themes were identified within the first domain and five within the second.

Domain 1: Perceived reasons for inappropriate antibiotic prescription in primary care

The participants' expressions implied similar problems of the relationship between physicians and patients in primary care. FPs stated many of the issues. Thus, we can make some inferences from their explanations. The most remarkable problem was the personal feeling of insecure job environment of the FPs.

Pressure/demand of patient or their relatives (14 participants)

The most important theme that almost all participants agreed on was the pressures and demands of patients and their relatives, especially parents. Physicians often felt forced into prescribing antibiotics without compelling symptoms or findings. On this theme, participants stated that:

Some of them are very demanding, and some do not want to use a lot of antibiotics. They keep on asking, no matter whether antibiotics are necessary or not, but I don't care how insistent they are. But some really insist on antibiotics. Some demand injectable antibiotics immediately. (FP 12, F).

Saving time and avoiding complaints from patients/Defensive medicine (14)

Physicians are expected to serve a substantial population, which puts them under immense pressure. Most physicians do not have enough time for more in-depth examinations or to wait for laboratory test results. All of them felt an obligation to protect themselves against accusations from patients or their relatives.

Even with the flu, when someone is sick, they want to be given antibiotics to keep them in reserve. We can't say to the patient "enough" or "no." Because there is social pressure, the neighbors or relatives tell them, "you must use antibiotics. If you don't use antibiotics, you won't get better." So, it doesn't matter if you give the patient flu medicines. They go even further, for example, and say, "my husband or my wife, my friend, took these drugs and got better. Would you prescribe me the same drugs?" (FP 8, M).

Diagnostic uncertainty due to insufficiencies in the basic laboratory facilities of family health centers (13)

Insufficiencies in basic laboratory tests (point-of-care tests = POCTs) in primary care centers were significant and one of the main reasons for an antibiotic prescription. In addition, none of the participants had access to quick diagnosis facilities in their FHCs.

We use a lab sometimes, yes. So, we're looking at CBC and sedimentation. If only we had a quick diagnostic test, it would be great. The lab results do not come on the same day; they reach the next day. Patients want to get better as quickly as possible, to heal as soon as possible. (FP 14, M).

Misconceptions of pharmacists (10)

The misconceptions of pharmacists were an important misleading factor. The participants emphasized the central role pharmacists play in antibiotic consumption in the community. Pharmacists have a massive impact on the culture of healthcare in Turkey, and they can drive patient choices and demands.

One of my most persistent issues is the direct effect pharmacists have on patients. The pressure from the pharmacists is not on us but on the patients. It doesn't affect us. It can affect patients from villages with low levels of education. (FP 11, F).

Inadequacies in the education/training of family physicians (7)

Several FPs pointed out that they did not receive enough training after graduation. This situation contributes to the problem in practice, where physicians are unaware of the side effects of inappropriate antibiotic prescription, especially selective pressure, and resistance development.

Training of doctors after graduation is required. Postgraduate education is ineffective. Doctors should receive serious training in antibiotic use. (FP 14, M).

Low prestige of family physicians in the community (7)

The respectability of FPs plays an essential role in their prescription behaviors. They felt pressure around their public responsibilities from many fronts. On the one hand, they are expected to accommodate patient expectations, while they must keep their autonomy on the other.

It's a family medicine thing. The physician examines the child, who has a cough or something, auscultates his lungs, finds nothing, gives a cold medicine, says, use them and see me again. That evening they go to a private hospital, receive ceftriaxone, and got diagnosed with pneumonia, sir. Then, the father comes, "you said nothing to my child; look what they gave," he says. Then, he listens to lungs again, nothing again. (FP 5, M).

Domain 2: Suggestions for improving antibiotic prescription in primary care

Improving diagnostic infrastructures in primary care centers (13)

All physicians agreed on point-of-care tests (POCTs), saying they would help avoid unnecessary antibiotic prescriptions. However, they complained about the lack of quick laboratory tests in their daily diagnostic processes. They expressed that, at the very least, a complete blood count test result should be available within a few hours for these patients.

My suggestion is that we get tests, throat swab tests, providing immediate results. I think that makes sense. Even that alone is enough. Or, you know, lab support that works immediately -analyzing the hemogram in the morning and reporting the results in the afternoon. A quick hemogram could be enough. But I think the essential thing is the throat swab test. (FP 12, F).

Qualifying education of family physicians (13)

There was consensus on the necessity of training in antibiotic use and antimicrobial resistance. The unethical behavior of some people damages the position and image of others in the community.

First of all, it is necessary to increase the awareness of doctors about the prescriptions they write. Doctor training is an absolute must. (FP 11, F).

Public campaigns and educational materials for patients (13)

The participants attached importance to public campaigns and mass education on antibiotic use. They expect that a public campaign could reduce the pressure patients put them under to prescribe antibiotics.

It's all about education. Doctors could educate their patients and their relatives using brochures. This would raise awareness just like the vaccination campaign did. People believe everything they hear in the local media etc. and certainly don't forget what they see. So, I think visual materials are essential. (FP 1, M).

Improving the reputation of family physicians in the community (10)

The majority of the participants expressed that they did not feel enough protection from patients and their relatives. Greater prestige in the community would make physicians more resistant to demands from patients for inappropriate antibiotic prescriptions.

Patients need to approach the doctor like a doctor. Hence, the state must protect the doctor. Doctors need their social position and perception to be improved. (FP 3, F).

Restricting the access to antibiotics for patients (8)

More than half of the participants suggested some restriction on or extra payment for antibiotics. They pointed to how easy it is to purchase antibiotics from pharmacies without a prescription.

Pharmacies must be sanctioned. That is, just as opiates cannot be given without a prescription, there should be a penalty when antibiotics are sold without a prescription. A 10-year-old can go and give money and get antibiotics. Opiates or drugs are subject to control and cannot be provided without a prescription - the same should apply to antibiotics. But there is no control, nothing; it cannot be prevented. (FP 1, M).

Discussion

This study presents the results of qualitative and semi-structured interviews with primary care clinicians in Turkey, looking at their perceptions regarding antibiotic prescriptions, barriers to appropriate antibiotic use, and their thoughts on strategies to improve the situation. Remarkably, all FPs agreed on

the role of pressure/demand from patients or their relatives and shared concern about how liability impacts inappropriate antibiotic prescription. The physicians stated an ongoing high level of patient demand as the most perceived important driver of antibiotic prescribing.

This study uncovered that one of the main reasons for avoiding confrontation with patients is related to the economic situation in primary care. This worry was stated clearly by some participants, implied by others. The other essential concern related to patient demand was workload and time constraints. FPs serve large populations and have a minimal amount of time for each patient. Therefore, any kind of other dispute with patients or accompanying persons is impossible. Physicians are nudged towards prescribing what patients demand to avoid such complications.

The fear of liability leads to a defensive practice among FPs. Several studies have shown that when physicians perceive a risk of litigation, they may adopt a defensive approach as a way to avoid it or to guarantee a form of defense in the case of a malpractice complaint [19-20]. In this study, the participants underlined strategies they adopt to avoid confrontation in their daily practice due to multiple factors. FPs are involved in a juggling act, trying to utilize their limited time in the best way possible, avoid malpractice complaints, and deal with all the pressures applied by patients.

Previous studies have suggested delaying antibiotic prescription to reduce antibiotic use when there is diagnostic vagueness and uncertainty as to bacterial or viral etiology. Diagnostic uncertainty may be a key driver of antimicrobial prescription for common infections in primary care, primarily when associated with the fear of liability and patient demands [18-21]. For example, physicians in primary care settings in Saudi Arabia have stated that they prescribe antibiotics for high fever in the absence of laboratory confirmation [22]. In our study, a majority of the participants emphasized that diagnostic uncertainty, due to a lack of access to diagnostic testing, nudges them into prescribing antibiotics.

FPs also complained that pharmacists mislead patients. Patients tend to have close relations with pharmacists and follow their suggestions. Medications can be purchased directly from a pharmacy without a prescription, which is subsequently demanded from the FP. Pharmacists are influencers on antibiotic use in many countries, especially in primary care, and physicians sometimes blame them for antibiotic misuse and resistance [23,24]. Improving antibiotic use was one of the most discussed domains in our study. Almost all participants expressed similar suggestions. FPs predict that the establishment of adequate diagnostic infrastructures in FHCs would improve antibiotic use markedly. POCTs can provide strong evidence to combat patient demands for antibiotics in primary care centers. Several studies on the potential benefits of using POCTs in acute respiratory infections in primary care medicine have recently been published. This research points to several barriers to the clinical use of many POCTs and the importance of appropriate training for clinicians and support tools for use in practice [25,26].

One of the remarkable themes was around the content and quality of family physicians' undergraduate and postgraduate education. Studies have reported contradictory results and pointed out several related factors about the impacts of educational intervention. Nevertheless, most studies support the efficacy of long-term antimicrobial stewardship programs [27,28].

Participants agreed on the efficacy of public campaigns for improving antibiotic prescription and educational material to raise patient awareness. They emphasized that effective public campaigns would help reduce the demand for antibiotics. Previous studies have supported this suggestion. However, there is no data on the sustainability of reductions in antibiotic prescription after an intervention [29].

Participants also suggested improving the social standing of family physicians in the community. One of the themes that came out of the interviews around improving antimicrobial prescription was reducing outpatient access to antibiotics. Reducing outpatients access could include banning the sale of antibiotics without prescription, but such restrictions are not always effective in daily practices [30].

This study has many strengths. One of them is the questionnaire design, which was developed after a series of focus group discussions and a wide-ranging review of the literature (Appendix 1). The participants worked in different parts of the country and this diversity provides a broad representation. The participants are key actors in inappropriate antibiotic use in the healthcare system, as most antibiotics are prescribed within an ambulatory setting. Their perceptions are crucial in understanding real problems and solutions. This study could help to understand the countries which have excessive antibiotic prescription rates.

This qualitative study also had some limitations. All but one of the participants were public employees and were careful about criticizing the implementation of the official health policies. They preferred to speak

indirectly about some problems. Further, our sample size was relatively small. However, they voiced the issues and experiences of their colleagues in the interviews. The family medicine system is relatively new, and some of the participants did not have long-term experience within this system. This study intended to outline the situation healthcare finds itself in, in the early days of a new system.

Conclusions

This qualitative study analyzed the perception of family physicians with regards to antibiotic use in their daily practice. There was consensus that pressure from patients, preventive approaches, and the absence of point-of-care tests in primary care centers are the essential factors in the unnecessary antibiotic prescription process. They suggested that providing quick diagnostic tests, better training of physicians, public campaigns for patients, and an improved social stance for physicians would improve antibiotic prescription.

Authors' contributions

SH conceived and designed the study, performed interviews and analysis, and wrote the manuscript. SH approved the final manuscript. ZA and AL contributed to data analysis and writing the manuscript. All authors have read and approved the manuscript.

Authors' information

During this study, SH worked at Dicle University Hospital, Diyarbakir, Turkey. Since 2019, SH has worked at the University Hospital Cologne, Department of Internal Medicine, Cologne, Germany.

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Annex – Qualitative Interview Questions

1. How long have you been working as a General Practitioner? In total, how many people do you serve as a Family Practitioner? How many patients visit your Family Health Centre per day?
2. What is the percentage of upper respiratory diseases among your patients in your practice?
3. What are the indications for prescribing antibiotics in your practice? Could you tell us the most common diagnosis for which you were prescribed antibiotics?
4. How do you decide on bacterial infection and an antibiotic prescription? Could you explain your approach to antibiotic prescription decisions in your workday? How is a typical antibiotic prescription written in your FHC?
5. Which diagnostic tools do you use to decide your diagnoses? Do you have enough time to evaluate your patients?
6. Do you have laboratory facilities?
7. Which factors are influential on your decision to prescribe antibiotics? Which factors do you think affect prescribing practice in primary care (not only for you but also for other colleagues)?
8. In your practice which difficulties and obstacles are significant in decision making for antibiotic prescription?
9. Who or what is effective on your antibiotic prescriptions? Which factors are disturbing for you in the decision process for antibiotic prescription?
10. What do you think about the antibiotic prescription without appropriate indications? Why do some GPs prescribe unnecessary antibiotics?
11. According to your experiences and observations, which factors are influential on the inappropriate antibiotic prescription in primary care?
12. What do you need to improve your antibiotic prescriptions in your daily practice?
13. Could you share your opinions about the improvement of antibiotic use in primary care? What should be done to reduce inappropriate antibiotic use? What precautions and measures could be helpful to improve antibiotic use?

Thank you for your contribution.