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Original Research

What drives using antibiotic without prescriptions? A qualitative interview study of university students in United Arab Emirates

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Abstract

Background: Bacterial resistance to antibiotics is considered as natural phenomenon that occurs over the time due to genetic changes. Bacterial resistance to antibiotics is significantly increasing in the UAE. Self-medication with antibiotics has been identified as a major factor for the development of antibiotic resistance, which is significantly increasing in the UAE.

Objectives: The purpose of this study was to explore the factors that contribute to the use of antibiotics without prescriptions among first year healthcare university students in UAE.

Methods: Based on the findings of an earlier survey study, a qualitative interview study was designed to explore common themes related to student's knowledge, awareness, attitude, views, and perceptions. Data were analyzed thematically for the identification of themes and subthemes within the data through the use of coding.

Results: The interview study identified four main themes with multiple subthemes related to the use of antibiotics without a physician's prescription by first-year healthcare students. The thematic analysis of the interviews revealed four main themes; medication habits and practices; reasons for self-medication; access to antibiotics without a prescription and gaps in students' knowledge regarding antibiotic resistance

Conclusions: Healthcare students in UAE are influenced by several factors including parents and friends influence, successful previous experience and investment of time and money to visit a physician. Our sample of healthcare students has a misconception about the use of antibiotics. The current interview study identified six new reasons for using antibiotics without prescriptions as compared to our earlier survey study. There is a need of multifaceted strategies to decrease unnecessary antibiotic use in our population sample.

Keywords

Anti-Bacterial Agents; Self Medication; Students, Health Occupations; Drug Resistance, Bacterial; Attitude of Health Personnel; Prescription Drug Misuse; Qualitative Research; United Arab Emirates

INTRODUCTION

Bacterial resistance to antibiotics is considered as natural phenomenon that occurs over the time due to genetic changes. However, various factors lead to the acceleration of these processes and the development of antibiotic resistance. These factors include both the under-and over-use as well as the irresponsible use of antibiotics.[1] such a practice may be attributed to consumer's lack of knowledge about the rational use of antibiotics, or the wrong habits in using antimicrobials. A key cause, among others, of the increased antimicrobial resistance is self-medication with drugs on one's own initiative without consulting a qualified medical practitioner.[2,3]

Bacterial resistance to antibiotics is significantly increasing in the UAE.[4] Self-medication with antibiotics has been reported to be high among university students, with the highest prevalence of 77% and 80% being reported among Pakistani[5] and Sudanese[6] students respectively. On the other hand, 40% of self-medication with antibiotics was reported among Palestinian, Iranian and UAE students.[7-9] Our earlier unpublished cross sectional survey among university students identified a high prevalence of misuse of antibiotics among university students in UAE.[10] We also demonstrated that misuse of antibiotics was higher among healthcare than non-healthcare students particularly those in their first year at the university.[10] The purpose of this study was to explore the factors that contribute to the use of antibiotics without prescriptions among first year healthcare university students in UAE. Therefore, our interview study targeted junior medical students who are at high risk of misusing antibiotics to gain a better understanding of participants' knowledge, awareness, beliefs, attitude, behavior, experience and the reasons behind misusing antibiotics. Furthermore, there was a need to explore and understand students' views and conceptions of antibiotics, symptoms of condition and bacterial resistance.[11]

In the UAE, the health care system is well developed and the predominantly governmental facilities offer their services to all citizens. However, outside the secondary care sector the majority of patients obtain their medication

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from the growing number of private community pharmacies. Although pharmacy practices in community pharmacies in the Gulf area, such as in the UAE, has shown some improvement during the last 20 years, it has not yet fully gained the trust of the public or health professionals. This seems to be due to several reasons, including the misconception by the public and health professionals that pharmacists are deficient in professionalism. In addition, the workload pressure on community pharmacists and a lack of enforcement of the regulations governing pharmacy practice within both the community and hospital pharmacies restrict the role played by the pharmacist.

Humans have different personal perspectives and phenomenological research is a popular methodological approach in health Care research.[12] Since phenomenology rely on human experiences and often have different interpretations, phenomenological research helps researchers to see the phenomena under investigation through the eyes of the participants. Furthermore, it provides a mean to understand the sense of making a framework of each participant that has been developed over time to shape their subjective experiences regarding a particular phenomenon under study.[12] Therefore, we employed a qualitative research design to address the objectives of the study with the aim to re-evaluate the problem of misuse of antibiotics from a different perspective and to fill a gap in the literature with regard to this phenomenon. This study, based on phenomenological research, is the first report in the Gulf region including UAE to apply qualitative direct interview to explore the knowledge, attitude, belief and experience of university students towards using antibiotics without prescriptions. Therefore it is hoped to fill a gap in the literature with regard to this phenomenon. Our findings are broadly consistent with other qualitative study among the public in addition to quantitative surveys among university students.

METHODS

A qualitative research study design was conducted at the college of dentistry, Ajman University, UAE. Purposive or 'criterion-based' sampling was employed to recruit study subjects because this approach depends on certain criteria determined by the purpose of the study to decide the type of participants that need to be investigated (inclusion or exclusion criteria) and where and when to conduct the interview.[12] Purposive or 'criterion-based' sampling was employed in this work to recruit study subjects to allow for theoretical data saturation.[12]

Guest, Bunce, and Johnson propose that saturation often occurs around 12 participants in homogeneous groups.[13] Approximately 15 participants were recruited and a brief screening questionnaire was used to ensure eligibility. Each respondent was approached via an invitation letter and an informed consent form delivered by hand during the dental histology lab sessions.

The primary data collection method used in this study was semi-structured interviewing. This schedule has clearly defined goals and guidelines to make data collection systematic and at the same time offers flexibility to change the sequences of the questions and respond to circumstances during the interview. A face-to-face approach was employed in this study to build a relaxing and personal relationship with participants. Furthermore, face-to-face interviews assisted in overcoming some logistical challenges, such as obtaining the written informed consent from the participants prior to the interview and recoding the interview.

The interview topic guide was developed based on the risk factors identified from the survey study conducted by the same researchers. An Ethical approval from Ajman University was obtained prior to conducting the study. Permission to conduct the study and access study participants was also granted from the Dean of the College of Dentistry.

All participants in the study were provided with a clear explanation of its purpose and procedure. Protocols were established to protect all participants from being exposed to any harm during the course of their participation. All participants were given information sheets, which were reviewed and discussed in order for everyone to clearly understand the study's parameters and procedures. Each participant was also required to sign the consent form and to provide verbal confirmation. They were also advised that their participation was voluntary and that they could terminate their agreement to be in the study at any point in time without any repercussions. Each participant also provided verbal consent to be tape-recorded during the interview.

Reflexivity is important to promote the honesty and transparency of the research process with the aim of improving the quality of research in order to improve rigor.[14] Reflexivity and rigour were integrated at all stages of this research by the use of a reflection diary and an ongoing process of self-awareness and self-reflection, with the main focus on the researcher's subjectivity and how the relationship between both the researcher and the research environment altered the conduct of the study. Furthermore, the researchers undertook training in qualitative data collection and data analysis and consulted local advisor after each interview and during the analysis of the data.

The collected data was analyzed using thematic analysis, which is a method of analysis that aims to identify, analyze and report repeated patterns of meaning (or "themes") within a data set.[15]

There are different analytical methods such as interpretative phenomenological analysis (IPA), narrative analysis, discourse analysis, Content analysis, and grounded theory.[15] Thematic analysis was chosen as the method of analysis for this study as it is a flexible technique that enabled the researcher to determine themes in several ways.[15]

This study applied a theoretical thematic analysis using Andersen model[16,17], because this form of analysis provide more detailed analysis of some aspect of the data related to the risk factors identified from the survey rather than giving a rich description of the overall data .

As the analysis was driven by the theoretical propositions, the data was approached with specific research questions

Table 1. Theme One: Medication habits and practices.

Sub-theme	Quote
Sub-theme 1: Frequency of antibiotic use behavior (Nearly all participants)	"I generally do use antibiotics frequently when I get sick when I feel that I have flu or am starting a cough or am developing any symptoms or fever and such diseases" (Participant 9)
Sub-theme 2: Method of selecting antibiotics with five participants	"Usually when I self-medicate I took the one that I took from the last infection. If it has the same symptoms … with the same antibiotic I took. If it is the first time I have these symptoms I usually go to a doctor and find what is wrong with me exactly because it is the first time that I have a sequence of symptoms and all that" (Participant 1)
Sub-theme 3: Attitude of brand Preference	"For the branded antibiotic, because that is the one I always use. That is the one I'm generally prescribed" (participant 4)
Sub-theme 4: Self-medicated with other drugs	"Yes, usually I start off with Panadol and see. So, like I said, if I have a sore throat or a fever sometimes I do start with Panadol and then I see if I feel better the next day. If I don't then I go straight to the antibiotic"
Sub-theme 4: Differences between participant's experience and other students.	"I have had conversations with friends where they assume the antibiotic is the best way to go if they have a fever or a sore throat or anything like that"(Participant 14).
Sub-theme 5: Perception of pharmacists' advice	"He [pharmacist] advises me to complete the course, to take it before the breakfast or after the breakfast, twice or once a day. Only one week, such things" (participant 12).

in mind, rather than wanting research questions to evolve via the coding process. One of the researchers coded a section of the data and then meets with another researcher who has read the transcripts to discuss the emerging codes. This process can help to identify any potential themes the researcher had not yet captured so far; and to address the validity of the codes and to give constructive critique (Investigator Triangulation).

The use of respondent's validation involves the study's participants in the process of validation.[18] This study employed this method by presenting the findings in an oral presentation to the participants after the completion of the study. Respondents were able to check the consistency of the findings and interpretations and then offer clarification or feedback on issues they identified.

The guidelines outlined by Braun and Clarke were the basis for performing the thematic analyses in this study and are illustrated by the steps below: phase 1 familiarising yourself with your data; phase 2: generating initial codes; phase 3: searching for themes; phase 4: reviewing themes; phase 5 defining and naming themes; and phase 6 producing the report.[15]

RESULTS

The age range of participants was 18-22 years old with the majority (13, 86.7%) of them being 18 years old. With the exception of one British, the rest of participants were Arabs including 3Iraqi, 2 Emirati, 4 Egyptian, 2 Jordanian, 1 Palestinian, 1 Iranian, 1 Sudanese, and 1 British student with expatriates comprising 13 (86.7%) participants. Analysis of the data revealed four main themes relating to participants' experiences, knowledge, attitude, belief and perceptions about antibiotic use, which reflects the existing student understanding of the relationship between self-medication with antibiotics and the development of antibiotic resistance, as well as methods for potentially enhancing the level of awareness of students and public on rational use of antibiotics. These 4 themes include; medication habits and practices, reasons for self-medication, access to antibiotics without a prescription and perceptions of antibiotic and the development of resistance.

Theme one: Medication habits and practices:

The first theme revealed in the analysis of the interview data including responses that reflect the participants' descriptions of their personal experiences with self-medication. This theme comprised six subthemes namely frequency of antibiotic use, method of selecting antibiotics, attitude of brand preference, self-medicated with other drugs, differences between participant's experience and that of other students and perception of pharmacists' advice (Table1).

Theme two: Reasons for self-medication

As can be seen in Table 2, two different risk factors related to the reason for the use of antibiotics without prescription were identified from the survey study. These include saving money and urgency of use. Therefore, participants were probed to explain the reasons behind misusing antibiotics. When asked about the reasons for their self-medication with antibiotics, the most common responses highlighted were time constraints or scheduling difficulties, reliance on prior prescriptions given for similar symptoms, the urgency of their situations, and advice from parents or friends to take the antibiotics. In addition, participants also cited financial reasons and fear of not getting antibiotics from the first visit to the physician.

Theme three: Access to antibiotics without a prescription

This section examined how participants get access to antibiotics without visiting a physician (Table 3). According to the participants, there are several ways students gain access to antibiotics without a prescription. Thus, this theme consists of three subthemes including; using antibiotics leftover from another prescription, buying them from the pharmacy without a prescription, or getting the medication from a family member or friends. Despite the fact that most participants were aware that using leftover antibiotics was not rational, they still used them as long as they are not yet expired.

Table 2. Theme two: Reasons for self-medication	
Sub-theme	**Quote**
Subtheme 1: Time and Convenience	"Usually it is because of time. Us being students, like on the campus and all of that. You do not really have time and if it happens during the week and you still have lectures tomorrow or during the day, and we have a strict attendance so you know you cannot miss the lecture. So you need something to help you get through the day without it being a fact that makes you delays work or anything". (Participant 1)
Subtheme 2: Previous experience	"The same issue that I face in there, I face it one or three times in here so I will take the same antibiotics because it worked the first time so it will work the second or third time."(Participant 6)
Subtheme 3: Urgency of situations	"Usually it is time and urgency." (Participant 1)
Subtheme 4: Advice from friends and family	"as soon as I started getting worse my dad advised me to take some antibiotics." (Participant 9)
Subtheme 5: Advice from pharmacist	"It was based on the advice of the pharmacist who had given it to me".(Participant 5)
Subtheme 6: Financial reasons	"Financial cos you know nowadays it's really, expensive to go and see doctors and find … and I don't think it's a major problem to have a headache or some, you know some minor diseases. So, that's why I usually self-medicate myself" (participant 7).
Subtheme 7: Not wanting to worry family members	"But if it is fever and if it is during the night and I can't go to doctor or my parents are asleep, I'm usually scared to just tell them because they worry and all that. So yeah, I just end up taking an antibiotic." (Participant 1).

Theme four: Perceptions of antibiotic and antibiotic resistance

Participants were probed to describe their current level of knowledge about antibiotics and antibiotic resistance as well as the method of determining the dosage of antibiotics. During the discussion, participants were also probed further about their attitude towards using leftover antibiotics and whether they recommend antibiotics to others. A total of even key subthemes emerged from the analysis (Table 4).

DISCUSSION

The aim of this qualitative study was to gain a deeper understanding of the use of antibiotics without prescription. The semi-structured interviews were constructed based on the results of the quantitative survey study. Interestingly, the main message provided by participants' responses was that knowledge and awareness alone is not sufficient to change participants' behaviour towards using antibiotics with or without prescription. Behavioural change requires multiple approaches of which the researcher should be aware in order to enhance the likelihood of a successful intervention.

The semi-structured interviews had shown substantial misconceptions about the indications for antibiotics as most of the participants used it for illnesses that are usually caused by viruses rather than by bacteria. Furthermore, some participants confused antibiotics with painkillers as they usually used antibiotics for curing pain. This study also demonstrated that participants had several reasons for their self-use of antibiotics and multiple accesses to them without prescriptions. Most participants were at least somewhat familiar with the term antibiotic resistance and had some understanding of the phenomenon. Moreover, the majority of the participants know that self-medication with antibiotics contribute to the development of antibiotic resistance.

The respondents indicated that they frequently use antibiotics without a prescription when ill. According to a previous report[19] self-medication with drugs, home remedies or herbs without consulting a physician, in order to treat sickness was a common practice. While making informed decisions regarding one's own health is recommended[19], the self-medication with some drugs including antibiotics should not be encouraged. This statement is also supported by the suggestion that diagnostic processes are needed to determine whether an infection is bacterial or viral in origin with the use of antibiotics being rational or irrational respectively.[20,21]

In the present study, respondents were also probed for their habits in selecting antibiotics as a preferred drug for self-medication. The findings suggested that students often rely on previous recommendations from a physician for similar symptoms, or the pharmacist's advice and some of them claiming they take whatever is available in the house whether for a family member or past illnesses. Moreover, three of the participants believed that their university courses make them more prepared to make a decision regarding self-medication with antibiotics. Our results in this respect are similar to findings in India where the majority (685; 82.3%) of medical students practiced self-medication with antibiotics for symptoms such as fever, headaches, or respiratory tract infections.[22]

The respondents argued that their main reason for self-medication using antibiotics may be the effectiveness of such medications when previously taken to treat similar symptoms, the fact that they are saving time by not seeing a physician, urgency of use, financial reasons, or the

Table 3. Theme 3: Access to antibiotics without a prescription and its sub-themes	
Sub-theme	**Quote**
Subtheme 1: Leftover Antibiotics	"Well, yeah if it's not expired, I will take it. Because, why would I go buy another one if I already one." (Participant 7).
Subtheme 2: Pharmacy	"So, I went to a pharmacist and he prescribed me with antibiotic. And that is the first time I got an antibiotic from a pharmacy". (Participant 5).
Subtheme 3: Family	I'm not sure. I think my dad gets it from the hospital where he works from. But I don't go to the doctor and have a check-up in order to get it. (Participant 11).

Table 4. Theme four: Perceptions of antibiotic and antibiotic resistance and its subthemes.

Sub-theme	Quote
Subtheme 1: Antibiotic- seeking behavior	I started when I was in the school. Once I went to a doctor and he gave me an antibiotic, my mother realised that I got cured fast with the antibiotic so every time I get sick my mother goes and buys me an antibiotic. (Participant 13)
Subtheme 2: Knowledge about indications of antibiotics	"Well when I feel unwell and ill. Like even if I have a headache or something I usually take antibiotics" (Participant 7)
Subtheme 3: Effectiveness belief	"It is powerful but it depends on … if you are using it for the right bacterial infection some people use wrong antibiotics for the wrong bacteria so that won't be effective at all. So it depends on what you are treating in your body. Then the antibiotic will be effective and if you continue the course fully".(participant 1)
Subtheme 4: Method of determining the dosage of antibiotics	"I know that based upon reading the labels which are found on the boxes and based on the questions that I ask from the pharmacist from the pharmacy."(Participant 5)
Subtheme 5: Understanding of antibiotic resistance	"In some cases the bacteria may develop a mutation against the bacteria where they are no longer sensitive against the antibiotic and they are able to multiply and this will come into negative effect with the human " (participant 10).
Subtheme 6: Association between misusing antibiotics and developing antibiotic resistance	"Yes. Because if you are misusing it you are allowing your body a chance to build up resistance and you are not needing it so you are just building up useless resistance and it overall your body will stop reacting with the antibiotics." (Participant2).
Subtheme 7: Attitude towards recommending antibiotics to others	"I don't recommend them because I'm not a doctor and usually, I don't usually do the things which are not in my own criteria. So, I don't usually recommend anyone to do it." (Participant 6).
Subtheme 8 : Attitude towards completing the course of antibiotics	"When I came to know that finishing the course is really important, it is part of the treatment so I have to finish the course." (Participant 15)

encouragement they received from friends and family regarding antibiotic use. These findings are consistent with those reported in Saudi dental patients where 80% self-medicated with antibiotics and 72.9% of them based their use on friend's advice.[23] Another reason for resorting to self-medication, as highlighted by the respondents, was lack of time because of their busy study schedule. This reason was not a prevalent factor in some studies.[24,25] However, other studies claimed that lack of time and previous experience with similar symptoms are influential factors promoting self-medication.[5,26] Moreover, lack of time intermingles with the urgency of use.[5] It is interesting to point out that one of our respondents argued that she often self-medicated with antibiotics because she cannot visit a doctor at night when she gets a fever. In addition, a small number of respondents argued that their economic status is a reason for self-medication, as it is less expensive to purchase the medication without visiting a physician. This is further supported by reports that self-medication with antimicrobial drugs is common in low and middle-income countries.[27]

Easy access to antibiotics without a prescription as revealed by our thematic analysis indicates that students in the UAE can easily access antibiotics without a need for a specialist's prescription. In harmony with recent observations in the Middle East[28-30], the most common sources for obtaining antibiotics, according to our respondents, were left over from previous treatments, friends and family and pharmacies. Irrational antibiotic use for mild illness, such as fever, cold and cough has also been reported in Saudi patients[30] and more recently in Malaysia.[31] Intriguingly; in the later study a small (4.5%) number of participants used antibiotics to prevent illness. Despite the strict UAE regulations on dispensing antibiotics, the later seems to evade such restrictions as evident by one respondent admitting that his healthcare father freely brings the drugs to their home. This indeed suggests that not only the public but also healthcare professionals are misusing antibiotics.

In our present study, respondents also demonstrated the existence of significant gaps in their knowledge regarding responsible antibiotic use and the possible risk of development of resistance. This is consistent with the findings in Pakistan[28] where a large number of Pakistani students were unaware of the significance and risks of bacterial resistance. Moreover, only one participant in the present study was able to "define" correctly the antibiotic resistance. Their responses indicated they perceived antibiotic resistance as a change in the human body, not in the bacteria, as the body becomes resistant to the effect of the antibiotic. Similar confusion among patients in relation to antibiotic resistance has also been reported elsewhere.[32,33] In the studies of Sharif and co-workers[9,34], students were aware of antibiotic resistance however they did not provide details of this awareness.

Earlier studies[35,36] have shown that patients often expect a treatment using antibiotics for upper respiratory tract infections, which are generally of viral origin.[20] Poor knowledge and misconceptions about antibiotic use are enhanced in patients by physicians who prescribe antibiotics without thorough examination of their patients and also by pharmacists who freely dispense antibiotics without prescriptions. It has been suggested that in addition to poor law enforcement in UAE, an additional ethical component may contribute to the progression of the problem.[37] However, the assumption of the later authors that such a component is not encountered in other countries is not totally correct as shown by studies in other countries.[38,39]

Limitations

Limitations associated with this research included the sample size of the study, the selection process, cultural issues and sensitivities regarding revealing socially undesirable behaviors. The fact that the interview was conducted by a male foreigner who is not associated with the university may have also had an impact relating to culture and sensitivities to openly and freely speak about their experience of using antibiotics without prescriptions.

CONCLUSIONS

This study provides valuable data on irrational use of antibiotics. There is a clear misconception about the use of antibiotics in the sample under investigation. While few participants reported some knowledge of antibiotic resistance, there was little elaboration on secondary infections or consideration of misdiagnosis among the participants. More research is needed to determine the effectiveness of policy change on individual self-prescribing behaviors. Nevertheless, a parallel awareness campaign aimed at training physicians could help address the over-prescribing of antibiotics as perceived by the participants. More research is necessary to fully understand the medication experiences of students who frequently take antibiotics without a physician's prescription. Future research studies in the UAE should examine the effectiveness of enforcing laws prohibiting the selling of antibiotics without prescriptions.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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