Self-medication with antibiotics among non-academic staff members of a Sri Lankan state university

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ABSTRACT

Introduction: Studies have shown that the public knowledge on antibiotics is poor although antibiotic self-medication is common. This study aimed to determine the knowledge and utilization patterns with regard to self-medication with antibiotics among non-academic staff members of a Sri Lankan University.

Methods: This is a descriptive cross-sectional study, among non-academic staff members of a selected state university in Western Province of Sri Lanka. Consecutive sampling was used and data were obtained using a self-administered questionnaire and analysed using *SPSS*, version-22.

Results: There were 321 participants (response rate - 80%); There were 61.5% of females; mean age was 36.8±8.8 years. Of the participants 40.2% self-medicated with antibiotics at least once during the past 12 months. Out of them 73.6% used amoxicillin. Commonest disease treated was common cold (68.2%). The commonest reason for self-medication was that they had been prescribed with the same medicines for similar symptoms in the past (78.2%). Of the participants who self-medicated 89.9% had got them from a community pharmacy. Antibiotics were stopped by 87.6% when their symptoms disappeared and 64% kept the leftover antibiotics at home for future usage. Majority of the respondents, 206/321 (64.17%) showed a low level of knowledge, while 105/321 (32.71%) showed a moderate level of knowledge while only 10/321 (3.12%) showed a high level of knowledge. The median knowledge score was 58 (Interquartile range, IQR: 42 - 67) meaning that the overall knowledge of the participants was inadequate.

Conclusions: More than one-third of the non-academic staff members in the selected university is practising self-medication with antibiotics. Majority had a poor level of knowledge and practices on antibiotics and their usage.

Keywords: *Antibiotics, knowledge-practice-attitudes, non-academic university staff members, self-medication.*

Introduction

Antibiotic resistance is one of the important public health problems and we are now at the dawn of a post-antibiotic era (1). Urgent need to control the emergence and spread of antimicrobial resistance as well as producing new antibacterial agents have been prompted (2).

Self-medication is the selection and use of medicines by individuals to treat self-recognised illnesses or symptoms (3). Self-medication is recognised as an important health issue, especially in developing countries (4, 5). Practicing self-medication for drugs such as antibiotics is a factor contributing to development of drug resistance (5-7).

Inappropriate use of antibiotics causes emergence of antibiotic resistance. Self-medication with antibiotics has been identified as a main driving force for the development of antibiotic resistance (9). Using antibiotics without a proper indication, incorrect dosing and duration are all considered as contributing factors for the development of antibiotic resistance (10, 11).

Many studies carried out in both developed and developing countries have shown and described the practices of self-medication with antibiotics and other drugs (8, 12-14,). All these studies show that the public knowledge on antibiotics is poor and the majority practice antibiotic self-medication.

Data regarding knowledge, and utilization patterns of antibiotic self-medication in Sri Lanka among the public is scarce. But in day-to-day life we have experienced that a lot of people tend to self-medicate with antibiotics. Although antibiotics are meant only to be dispensed for a prescription issued by a medical officer, pharmacies issue them without prescriptions and some pharmacists prescribe antibiotics for patients seeking advice. Improper regulatory systems contribute to this inappropriate practice (15, 16, 17).

We aimed to identify the gravity of antibiotic self-medication among non-academic staff members at a selected Sri Lankan state university. It will be important in implementing programs to educate and to change incorrect practices among public which in turn will help to prevent emergence of post-antibiotic era. As Sri Lanka lacks data on this subject the aim of this study was to gather further information about the knowledge, and utilization patterns with regard to antibiotic self-medication.

Methods

The study population consisted of non-academic staff members of all faculties of a Sri Lankan state university situated in the Western Province. Sample size was calculated according to $n = z^2p\ (1\text{-}p)/d^2$ with z being 1.96 (critical value of specified confidence at 95% confidence interval, p=0.5 (expected proportion of the population self-medicating with antibiotics in developing countries), margin of error (d) = 0.05. The required sample size was 290.

The study was conducted in 2015 and the data collection was done during the period of August, 2015 to October, 2015. Those who were permanently or by contract basis attached to the university non-academic staff, who gave consent to participate in the study, were included in the study. Consecutive sampling was done using the non-academic staff registry of the university.

Data collection of this study was carried out by two pre-intern medical graduates using a self-administered questionnaire. The participants were reached at their working places during the working hours, but at times that they were relatively free. The participants were given instructions and information verbally as well as in writing and informed written consent was obtained prior to handing over the questionnaire.

The investigators were physically present during the time of responding and the questionnaires were collected in about 20 minutes. The questionnaires only had a serial number for identification so the participants could not be identified individually. Collected data were entered and analysed using standard *SPSS* software, Version 22.

Study instrument

A self-administered questionnaire was developed initially in English. The questionnaire was translated to Sinhala and Tamil, both by professional translators. They were then administered to a group of medical undergraduates who were proficient in English and the native languages. Further adjustments were done to the Sinhala and Tamil language translates.

The questionnaire consisted of six sections. The first section was designed to obtain demographic data. The second section was on self-medication with Western medicine and the last of this section acted as a filter question. The question was 'Have you had any antibiotic without a medical prescription, within the past 12-month period?'. Those who answered as 'yes' were directed on to section 3, while those who answered 'no' were directed on to section 4. All participants either answered section 3 or 4. Section 3 consisted of 14 questions, 13 multiple choice questions and one question with two sub questions on which a five-

point Likert scale was used to assess the use and practise of antibiotic self-medication within the past 12 months duration. Section 4 consisted of 9 multiple choice questions, and this was used to assess if the participants had ever practised self-medication with antibiotics in their lifetime. Section 5 was used to get the attitudes of the respondents regarding antibiotic self- medication and other related factors. Section 6 consisted of three MCQs, one short answer question and a question with 8 sub questions in which a five-point Likert scale was used and the responses were strongly disagree, disagree, not sure, agree and strongly agree. This section was used to assess the knowledge of the participants on antibiotics. During analysis strongly disagree and disagree were compiled under one group. The same process was followed for agree and strongly agree. The three MCQ type questions and the short answer question were awarded 5 marks each for a correct answer. Negative marks were not allocated for writing wrong answers. For the question, which was assessed using a Likert scale, 5 marks were given to each correct answer while 5 marks were deducted if the answer was wrong and zero marks if the answer was 'not sure'.

The marks were given out of 60 and were converted into a percentage mark. Knowledge of the participants were divided into high, moderate, and low if the percentage mark was more than 80, between 60 and 80 and less than 60 respectively.

Ethics Review Committee of the Faculty of Medical Sciences, University of Sri Jayawardenepura, Sri Lanka granted approval for this study.

Results

Out of 400 questionnaires distributed, the final responded number was 321 (response rate 80.25%). Incomplete questionnaires were excluded from the analysis. The mean age of the sample was 36.75 years (±8.82 years). There were 53.9% males. Seventy-seven (24%) had Ordinary Level as their highest educational level while the rest had Advanced Level or a higher qualification. Two hundred and fifty-eight (80.4%) were married while 67.29% of them had one or more children. Two hundred and forty-four (76%) had a medical insurance. The socio-demographic data of the respondents are shown in Table 1.

Table 1: Socio-demographic characteristics of the study participants (n=321).

Socio-demographic characteristics	n	(%)
Gender		
Male	173	(53.9)
Female	148	(46.1)
Highest education qualification		
O/L	77	(24.0)
A/L or above	244	(76.0)
Marital status		
Married	258	(80.4)
Unmarried	63	(19.6)
Having children		
Yes	216	(67.29)
No	105	(32.71)
Having a medical insurance		
Yes	244	(76.0)
No	77	(24.0)

O/L - Ordinary Level, A/L - Advanced Level

Of the 321 respondents, 229 (71.3%) had self-medicated with a Western medicine at least once in their lifetime. Among them 10.5% has taken a drug that requires a prescription and 89.5% has taken paracetamol.

Antibiotic self-medication practices

Out of the 321 respondents 129 (40.2%) had self-medicated with antibiotics within the recalled past 12 months. Majority (68.2%) had used antibiotics for common cold. The other conditions for which the antibiotics were used are showed in Table 2.

Penicillin group of antibiotics have been used by 80.6%, with amoxicillin being the most commonly used antibiotic (95/129, 73.6%). Name of the antibiotic was not mentioned by 25/129 (19.4%).

Among the reasons for not consulting a doctor, 62/129 (47.3%) mentioned that the doctor had prescribed the same medicine for similar symptoms in the past, 56/129 (48.4%) mentioned that they considered the illness as a minor illness not requiring a consultation of a doctor and 52/129 (40.3%) mentioned that they needed to get a quick relief.

Table 2: Conditions for which antibiotics were used (n=129)

Condition	*n	(%)
Common cold	88	(68.2)
Sore throat	68	(52.7)
Fever	40	(31.0)
Cough	16	(12.4)
Teeth problems	10	(7.8)
Diarrhoea	8	(6.2)
Physical injuries	8	(6.2)
Skin infections	6	(4.7)
Infection prophylaxis	2	(1.6)

*There were individuals who sought treatment for multiple problems

Almost 90% has had the practice of buying antibiotics from community pharmacies over-the-counter without a doctor's prescription. The rest (10%) had used left over medicine at home. From the ASM group, 101/129 (78.3%) had acted according to their own decision, while 14 out of all the participants (14/129, 10.9%) had consulted pharmacists.

Most of the participants (n=113/129, 87.6%) stated that they stopped taking the drugs when their symptoms disappeared.

Sixty-three (n=63/113, 55.8%) had stopped antibiotics after 2 days, while 35/113 (30.9%) had completed only 1 day of medication and the rest had not mentioned the duration they had used the antibiotics. Left-over antibiotics have been kept by 7/129 (64%) for future usage. Hundred and sixteen (n=116/129, 91.3%) had confessed, they had to meet a doctor again, due to relapse of symptoms following incomplete courses of antibiotics. None of the participants had developed any side effects during self-medication with antibiotics.

In terms of knowledge of using antibiotics, 149/321(46.4%) defined antibiotics as drugs which act against all microorganisms including, bacteria, fungi and viruses. However, 79/321 (24.6%) correctly said that antibiotics are medicines which specifically act against bacterial infections. Majority (77.3%) correctly identified amoxicillin as an antibiotic among a group of drugs given.

Only 53/321(16.5%) knew that common cold is a simple viral infection of the upper respiratory tract. Only 2/321(0.6%) knew correctly what was meant by antimicrobial resistance while 284/321 (88.5%) didn't know what it meant and the rest had not answered the question. The knowledge on antibiotic use was assessed by a Likert scale and the responses are shown in Figure 1.

Majority of the respondents, 206/321 (64.17%) showed a low level of knowledge, while 105/321 (32.71%) showed a moderate level of knowledge and only 10/321(3.12%) showed a high level of knowledge. The median score of all the respondents was 58 (Interquartile range, IQR: 42-67).

Discussion

This study revealed that more than two thirds of the non-academic staff in the university where the study had taken place had self-medicated with antibiotics within the period of 2015-2016. This is a high level of inappropriate use of antibiotics. Many research carried out regarding this subject among different groups of participants have reported similar usage frequencies. A study carried out in urban Puducherry, India with 352 household members in 124 households, reported that 11.9% had used allopathic self- medication in a 3-months recall period. They have mainly used these for fever, headache and spasmodic abdominal symptoms and more than 90% of respondents have agreed that they would like to use self-medication in the future too (8). Another study from South Africa has shown a very high prevalence of self-medication (93% -98%) (18).

A study carried out in Sri Lanka has reported 12.2% and 7.9% prevalence of self-medication to allopathic drugs from an urban and rural area respectively, within the previous two weeks of interview (19).

Another cross-sectional study carried out in rural China to assess the knowledge, attitudes and practices of parents on the use of antibiotics in children reported that out of 854 participants, 62% had self-medicated their children with antibiotics and 79% of the sample thought that antibiotics could cure viral infections (20).

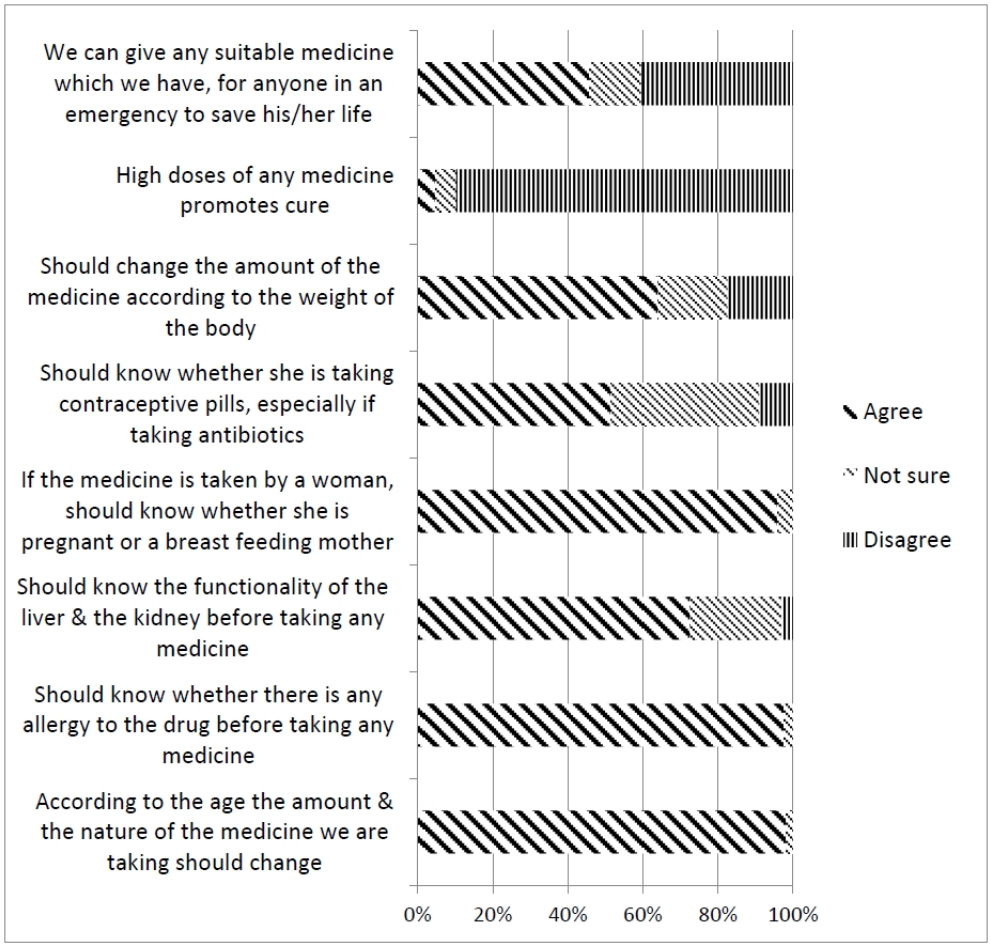

Figure 1: Responses related to knowledge of antibiotic use

In comparison to our study findings, a study involving university students in Western China reported that out of 737 respondents, 40.2% (294) had self-medicated with antibiotics in the past six months. They also have concluded that, undergraduate students had inadequate knowledge, moderately accurate beliefs and inappropriate practices concerning antibiotics and a high rate of self-medication (18). Even the academic staff members of a Turkish university have shown similar results with 45.8% of the respondents having the practice of self-medication with antibiotics (19).

Although, data regarding this subject is scarce in Sri Lanka, a research carried out among school teachers in Kegalle district revealed that 67.7% had self-medicated with antibiotics within the year of 2015 and that knowledge on antibiotics was poor in 56% (20). Therefore, it is evident that antibiotic self-medication is high and show similar rates in different categories of people.

This study showed that the majority had used antibiotics for common cold. The second most common cause reported was sore throat. Common cold is mainly caused by viruses and is not an indication for antibiotics unless there is a secondary bacterial infection. This inappropriate use of antibiotics has been reported worldwide by many studies. A study carried out in 19 European countries reported that a throat symptom (including red or sore throat) was the most common reason for antibiotic self-medication (21). 48% of academic staff of Faculties of Dentistry and Pharmacy and 80.7% of academic staff of other faculties excluding Faculty of Medicine, Ege University, Turkey believed that antibiotics could be used for common cold (21). Therefore, our study keeps in line with other studies in that, majority use antibiotics to self-medicate for inappropriate indications such as sore throat and common cold.

Majority of the participants in our study used penicillin group of antibiotics for self-medication and amoxicillin was the most used antibiotic. Penicillins were the most used antibiotic group in the study carried out in 19 European countries, with 54% out of total courses (22). Amoxicillin was the most frequently used antibiotic in them. Several studies carried out in Asian developing countries as well as in European countries have showed same results (22, 24, 25). These results show that people tend to use the older generation of drugs, low-cost antibiotics which are frequently available in community pharmacies. Overusing these antibiotics have led to resistance which have been shown in various studies and newer antibiotics need to be found out to overcome the newly emerging resistant microorganisms leading to a post-antibiotic era (22, 23).

Having been prescribed the same medications for similar symptoms in the past by a doctor was the reason in 47.3% of our participants who self-medicated with antibiotics. They had thought that all similar symptoms could be treated with the same drugs and without spending consultation fees or time they had simply bought the same drugs from a community pharmacy or had used leftovers. This is a common reason for self-medication with antibiotics in previous studies (18). A study carried out among Jordan adults found out that the strongest predictor of patients' belief in the effectiveness of antibiotics was having previously received antibiotics for a similar illness (26). The majority (89.9%) of our study participants who had self-medicated with antibiotics had got them from a community pharmacy without a prescription and the rest had used left over medicine. Regarding the source of antibiotics, 59.2% of Chinese university students who participated in a similar study stated retailed pharmacies (18). A study among adults and parents in the Greek urban population found out that 55% admitted using leftover antibiotics (27). Majority of our study participants (64.3%) also admitted of keeping the leftover antibiotics for future use. In community pharmacies, salespeople will often recommend medicine that will gain them more profit. Although there are rules and regulations that antibiotics cannot be issued without prescriptions, they are not carried out in practice due to the inadequacies in regulations. This practice leads to inappropriate use of antibiotics which ultimately contributes to development of resistance. There needs to be more strict and practical regulations enforcing supervision of the sale of antibiotics in community pharmacies.

Regarding the duration of antibiotic usage, 48.8% of them had used them for 2 days while 27.1% used them for only one day and 87.6% stopped taking the drugs when their symptoms disappeared without completing the full course. This practice has been seen in other similar studies. The mean duration of self-medication with antibiotics had been significantly lower compared with courses prescribed by a healthcare provider (29). This was also shown in a study carried out in Mexico that the duration of treatment was 4 days when the drug was prescribed by a physician, compared to a median of 2 days when the drug was self-medicated (30). Use of incomplete antibiotic courses result in premature cessation of antibiotics before complete eradication of the pathogens, and it is one of the major factors leading to antibiotic resistance (28, 30).

This study revealed that 46.4% of the participants incorrectly believed that antibiotics act against all bacteria, fungi and viruses, similar to studies carried out in China and Karachi (18, 32). It is a well-known fact that the antibiotics do not have a role in treating viral infections, although they might be helpful in treating secondary bacterial infections (33).

Very few of them knew correctly what was meant by antibiotic resistance while the large majority didn't know what it meant. Meanwhile a Chinese study among 731 university students showed that 89.5% students knew about antibiotic resistance (18). The difference could be due to the fact that university students' knowledge is continuously updated by the use of new technology and their learning practices, compared to the non-academic staff members of a university who do not actively engaged in learning activities all the time.

This study revealed that the overall knowledge of the participants was at a low level.

Previous studies have shown that antibiotic self-medication is a problem in Sri Lanka (15, 22). We also observed that the majority in our study practiced it. Furthermore, level of knowledge

regarding antibiotics was poor among the majority. Since our study participants comprised of non-academic staff members of a university, the results could be reflected on to the general public of Sri Lanka to some extent.

Limitations of this study included a recall bias as data collection was based on self-reporting of the antibiotic usage. It is possible that this study population did not represent the general public of Sri Lanka, thus limiting the generalizability of the results.

Conclusions and recommendations

Self-medication with antibiotics among the non-academic staff members of this Sri Lankan university was high and majority had a low level of knowledge about antibiotics. More studies need to be carried out among different study groups in Sri Lanka to assess the gravity of this alarming health problem among the general public as a whole. Meanwhile, immediate action is needed to be taken to alter this trend and to avoid serious health consequences. Educational programs addressing this issue needs to be implemented. Initially the general public needs to be educated thoroughly on antibiotics and adverse outcomes of misusing them including development of antibiotic resistance. Media could play an important role to improve the public awareness. Workplace-based health education programs could also help. Policy makers should look in to strengthening and implementing regulations over pharmacies. Policies should be implemented to stop over-the-counter issue of antibiotics without prescriptions.

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