



The Rate of Adherence to Antibiotics and Reasons for Non-adherence among the Public

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

Aim: Poor adherence to antibiotics is common and related to poorer clinical outcomes such as increasing the bacterial resistance. To explore the rate of adherence to antibiotics and to know the reasons that lead to antibiotic non-adherence among the public.

Methodology: This is a retrospective study include an online questionnaire survey for the participants who were prescribed oral antimicrobial drugs during the last year. The data was collected and analyzed using Excel sheet software and the Descriptive data were presented by frequencies and percentages.

Results: The majority of the respondents stated that they sometimes forget to take their antibiotics. Moreover, 78.3% of them said that sometimes they forget to carry their drugs when they go out. They reported many reasons for noncompliance but the major reasons were "they do not need to continue treatment once the condition improves" followed by "they are too busy in study or work".

Conclusion: Numerous factors lead to antibiotic noncompliance, but the main reasons were related to the public knowledge and attitude. Therefore, antimicrobial stewardship programs should focus on the patient education to solve the problem of non-compliance.

Keywords: Adherence; non-adherence; rate; antibiotics; public.

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1. INTRODUCTION

Antibiotics are among the greatest advances in the medical field. Antibiotics refer to drugs that kill the microorganisms or inhibit the growth of these microorganisms. The use of antimicrobial drugs saved numerous lives and resulted in less morbidity from different infections [1-3]. Nevertheless, bacteria start developing resistance to the antibiotics. The process of antibiotic resistance is caused mainly by excess usage or unsuitable usage of antibiotics. The resistance development could result in many consequences; one of the main consequences is that the treatment of infections becomes more difficult [4].

Adherence to medications is defined as the extent to which a patient's follow the medical or health advice when he takes his medications [5]. Generally, Poor medication adherence is common and leads to negative outcomes such as the worsening of the patient's condition, increased the costs of health care and increase the mortality rate [6]. Poor adherence to antibiotics is common, many previous studies reported that medication adherence is often suboptimal and related to poorer clinical outcomes such as increasing of the bacterial resistance [7-11].

Bacterial resistance could lead to more mortality rate, prolonged illness, increased the economic burden for the society and increased risk for complications [4]. In order to improve adherence to antibiotics, many strategies could be applied such as using personal phone calls and written information about the importance of taking all the medication [12].

It is important to know the rate of adherence to antibiotic use and to know the factors that affect patient non-adherence to improve patients' adherence. Therefore, this study aims to explore the rate of adherence to antibiotics and to know the reasons that lead to antibiotic non-adherence among the public.

2. METHODOLOGY

This is a retrospective study include a questionnaire survey that was administered to assess the rate of adherence to antibiotics and to know the reasons that lead to antibiotic non-adherence among the public. The survey is prepared using the survey of previous study and after that it is converted to online form using google forms [13]. Inclusion criteria include the

males and females who were willing to answer the survey questions and who were prescribed oral antimicrobial drugs during the last year. Exclusion criteria include the people who don't receive antibiotics during the previous year and those who could not read or speak clearly.

The questionnaire collected information related to 3 key domains: the first part is the personal information (demographic data). The second part include questions about the compliance to antimicrobial therapy and the third part about the reasons for noncompliance.

The sample size is calculated using Raosoft sample size calculator using margin of error 5%, confidence level 95% and response distribution of 50%. The minimum recommended size of this survey was 385.

The data was collected and analyzed using Excel sheet software and the Descriptive data were presented by frequencies and percentages.

3. RESULTS

The 609 respondents were mainly at the age level between 10 to 29 (88%). They are equally distributed according to the gender, both male and female were approximately 50 of the respondents. The residential address for majority of the respondents were city (88.8%). Table 1 shows the personal information of the participants.

The majority of the respondents stated that they sometimes forget to take their antibiotics (73.2%). Moreover, 78.3% of them said that sometimes they forget to carry their drugs when they go out. The compliance to antimicrobial therapy is shown in Table 2.

The respondents report many reasons for noncompliance but the major reasons were "they do not need to continue treatment once the condition improves" (44.7%) followed by "they are too busy in study or work" (39.5%) and "they are unaware of the consequences of taking antimicrobial drugs without the doctor's advice" (38.3%). Reasons for noncompliance are presented in Table 3.

4. DISCUSSION

In this study there were 609 participants. The respondents were mainly at the age level between 10 to 29. They are equally distributed according to the gender. The majority of the respondents were students.

The majority of the respondents stated that they are not completely adhere to antibiotics and they sometimes forget to take their antibiotics (73.2%) and only 3.9% said that they are completely adhere to the antibiotics and that they don't forget to take antibiotic in the past. Moreover,

78.3% reported that they sometimes forget to carry their drugs when they go out and 52.9% said that it is difficult for them to take antibiotics in accordance with the prescribed dose on time. These results showed a high percentage of non-adherences to antibiotics.

Table 1. Personal information

Variable	Category	Frequency (f)	Percentage (%)
Sex	Male	303	49.8
	Female	306	50.2
Age	10 to 19	327	53.69
	20 to 29	209	34.31
	30 to 39	52	8.53
	40 to 49	14	2.29
	50 -59	4	0.65
	More than 60	3	0.49
Marital status	Married	74	12.2
	Unmarried	524	86
	Divorced or widowed	11	1.8
Residential address	Rural area	56	9.2
	City	541	88.8
	Badia	12	2
Education level	Bachelor degree or above	269	44.2
	Under high school	340	55.8
Employment status	Employed	111	18.2
	Unemployed	58	9.5
	Retired	5	0.9
	Students	435	71.4

**This table includes demographic data of the participants*

Table 2. Compliance to antimicrobial therapy

Variable	Category	Frequency (f)	Percentage (%)
Do you sometimes forget to take your antimicrobial drugs?	Yes	446	73.2
	No	163	26.8
Did you ever forget your antimicrobial drugs in the past two weeks?	Yes	279	45.8
	No	330	54.2
Will you reduce the dose or stop medication without consulting a doctor when the current symptoms got worse or other symptoms appeared during treatment?	Yes	291	47.8
	No	318	52.2
Do you think that antimicrobial drugs with broad spectrum are more effective than those with a narrow spectrum?	Yes	393	64.5
	No	216	35.5
Do you sometimes forget to carry your drugs when you go out?	Yes	477	78.3
	No	132	21.7
Is it difficult for you to take antimicrobial drugs in accordance with the prescribed dose on time?	Yes	322	52.9
	No	287	47.1
Are new antimicrobial drugs more effective than the older ones?	Yes	402	66
	No	207	34
How often do you forget to take your antimicrobial drugs?	Never	24	3.9
	Occasionally	148	24.3
	Sometimes	281	46.1
	Often	113	18.6
	Always	43	7.1

**The table includes close ended questions to know the rate of adherence*

Table 3. Reasons for noncompliance

Reasons for noncompliance	Frequency (f)	Percentage (%)
Unaware of the consequences of taking antimicrobial drugs without the doctor's advice	235	38.3
Take too many drugs varieties, forget correct order and dosage	102	16.6
Clinical pharmacists do not specify the administration method and dose	61	10
The smell and the shape of the drugs is difficult to accept	146	23.8
Fear of adverse effects caused by long-term use	183	29.9
Long-term administration	104	17
Too busy in study or work	242	39.5
Drug prices too high to afford	108	17.6
Do not know the exact effect of the drugs prescribed by the doctor	117	19.1
Inadequate knowledge about the illness and take the drugs passively	110	17.9
Lack of confidence in young doctors	52	8.5
Effect of drug wanes after a period of time	83	13.5
Drug manuals are too technical to understand	60	9.8
The prescribed doses are difficult to comply with (e.g., need to break the tablet into two)	110	17.9
Worry about the adverse effects described in the drug manual	101	16.5
Do not need to continue treatment once the condition improves	274	44.7
Patients consider that their conditions do not require medication, and they will recover by themselves	148	24.1
Preference for secret recipe or food therapy	136	22.2
Gullible to advertising, television broadcasting or other promotion ways	28	4.6
New package of the drugs	39	6.4
Lack of attention from family members	115	18.8

**This table includes close ended questions about the common reasons of noncompliance*

Similarly, Fernandes M et al reported that in patients visiting community pharmacies the prevalence of antibiotic non-adherence was 57.7% [14]. Additionally, S. Tong et al reported that Up to 86.97% of the patients showed non-compliance to antibiotic therapy [13]. CarlLlor et al studied the adherence to antibiotic in ambulatory respiratory infections and stated that only 42.8% of the patients have good adherence to Antibiotic therapy [15]. In contrast with that Malin Axelsson stated that the percentage of non-adherence was estimated to be 9.4% [16] and Heike R. Rosin et al who reported that the vast majority of the respondents said that they take antibiotic as recommended by health care providers [17].

The respondents report many reasons for noncompliance but the major 5 reasons in the present study were "They do not need to continue treatment once the condition improves"

(44.7%), "They are too busy in study or work" (39.5%), "They are unaware of the consequences of taking antimicrobial drugs without the doctor's advice" (38.3%), "Fear of adverse effects caused by long-term use" (29.9%) and "Patients consider that their conditions do not require medication, and they will recover by themselves" (24.1%).

S. Tong et al reported that the major reasons for participants' noncompliance are "Fear of adverse effects caused by long-term use" followed by "They are too busy in study or work", "They do not need to continue treatment once the condition improves", "They take too many drugs varieties, forget correct order and dosage" and "Patients consider that their condition does not require medication, and that they will recover by themselves" [13]. The major reasons for participants' noncompliance in the present study were similar to the major reasons participants'

noncompliance in S. Tong et al study (for example, out of the major 5 reasons, 4 reasons were the same). Moreover, some previous studies reported similar reasons [18-20].

We can notice that the major reason in the study were factors related to the public knowledge, attitude and practice. As a result, the health care providers should focus their interventions on the patients to improve their knowledge and attitude and as a result to improve their compliance.

5. CONCLUSION

Our study highlights the high percentage of antibiotic noncompliance among the public. Numerous factors lead to antibiotic noncompliance, but the main reasons were related to the public, especially the lack of their knowledge, their attitude and the lack of their time management. Therefore, the health care providers should communicate effectively with the patients to improve their knowledge and attitudes. Moreover, antimicrobial stewardship programs should focus on the patient education to solve the problem of non-compliance.

CONSENT

As per international standard or university standard written participant consent has been collected and preserved by the authors.

ETHICAL APPROVAL

It is not applicable.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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