

Irrational antimicrobials use in northern border area- Saudi Arabia

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ABSTRACT

Over-use and misuse of antimicrobials in animals and humans is contributing to the rising threat of antibiotic resistance. To assess public knowledge, belief and behaviour towards Antimicrobials use in a general population in Northern Border Region in Saudi Arabia.

This was a cross-sectional study using a structured questionnaire carried out from November 2017 to January 2018 among the general public (N = 421).

The females represented more than half (67%) of the study group, Majority (78%) of participants' age ranged between 18 and 30 years. 65% of participants were highly educated. Regarding knowledge about antimicrobial use; About 27% of the respondents agreed that an indiscriminate and injudicious use of antimicrobials will lead to an ineffective treatment, 24% agreed that it will lead to emergence of bacterial resistance. 65% of respondents agree that Antimicrobials are effective in treatment of bacterial infections and not effective for viral infection. Only 23% of the respondents were aware that bacteria were not responsible for causing colds and flu, 75% were knowledgeable the fact that antimicrobial resistance is an important and serious public health issue.

The study highlighted the need to educate population regarding the usage of Antimicrobials and the complications of the misuses and what are the indications of Antimicrobials, use only doctor prescription to get Antimicrobials and also this study highlights the need to take decisive policy action to reduce non-prescribed antimicrobial use.

Key words: Antimicrobials, prescription, self medication, resistance.

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INTRODUCTION

Raising awareness of antimicrobial resistance and promoting behavioural change through public communication programmes that target different audiences in human health, as well as consumers is critical to tackling this issue. Selman Waksman first used the word antimicrobial as a noun in 1941 to describe any small molecule made by a microbe that antagonizes the growth of other microbes. From 1945–1955 the development of penicillin, which is produced by a fungus, along with streptomycin, chloramphenicol, and tetracycline, which are produced by soil bacteria, ushered in the antimicrobial age. Today, the evolution of antimicrobial resistance by important human pathogens has rendered these original Antimicrobials and most of their successors largely ineffective, and if replacements are not found, the golden age of Antimicrobials will soon come to an end.¹

The new WHO recommendations aim to help preserve the effectiveness of antibiotics that are important for human medicine by reducing their unnecessary use in animals. In some countries, approximately 80% of total consumption of medically important antibiotics is in the animal sector, largely for growth promotion in healthy animals. Irrational antimicrobial use has led society to antimicrobial resistance (AMR) defined as the ability of a microorganism (like bacteria, viruses, and some parasites) to stop an antimicrobial (such as Antimicrobials, antivirals and antimalarials) from working against it. As a result, standard treatments become ineffective, infections persist and may spread to others. In 2011, WHO set the theme of World Health Day as "Combat Antimicrobial Resistance: No Action Today, No Cure Tomorrow". and for this occasion the World Health Organization introduced a six-point policy package to fight against the spread of antimicrobial resistance.²

This shows a serious and global problem of antimicrobial abuse and there is a growing consensus to urgently develop new strategies for prevention of resistance of bacteria to Antimicrobials.³

In recent years, an increasing number of researchers have focused their attention on antimicrobial misuse, and follow with interest the knowledge, attitude and practice (KAP) towards Antimicrobials use of public.^{4,5}

The major chunk of the problem persists in the developing countries. India tops in the irrational and indiscriminate use of antimicrobials.⁶ Being the country with high infectious disease burden Antimicrobials are the most widely and frequently prescribed drugs accounting for the alarming increase in Antimicrobial Resistance (AMR).⁷ The irrational prescription practices by clinicians are mainly governed by the “more drug better doctor” beliefs of patients. Free unchecked over the counter (OTC) availability of Antimicrobials for human, animal and industrial consumption, self-medication, lack of knowledge, unjustified demand for Antimicrobials prescription and unawareness regarding antimicrobial resistance are other factors that add up to the current degrading situation. To curb this emerging horizon of AMR a national antimicrobial policy was developed, national surveillance database for antimicrobial use was established and national centre for disease control (NCDC) is designated as the focal point for AMR in the country.^{8,9}

Due to wide cross-national differences in antimicrobial use and public knowledge of Antimicrobials, determination of key populations requiring educational interventions is needed in each country prior to the establishment of effective educational programs. Further education should focus on improving patients' understanding of antimicrobial regimens.⁹

To initiate any sort of effective intervention, it is necessary to attain an understanding of the beliefs, knowledge and behavior pertaining to the use of Antimicrobials in a specific population. Several well documented studies have been conducted to do just that.¹⁰⁻¹⁴ Such studies focused on assessing the use of Antimicrobials in general or for specific diseases like upper respiratory tract infections (URTIs). The knowledge, belief and behavior of the public or patients are multifactorial and differ depending on the population or region. There are only a limited number of published studies in Saudi Arabia assessing medication compliance by patients as well as the public's knowledge and belief towards drug use, including Antimicrobials. The situation is quite similar in the Middle East Region in terms of sufficient research and published literature.^{10,15} Hence, this study aims to assess public knowledge, belief and behavior of antimicrobial use in northern border region in Saudi Arabia. The findings from this study would be a useful addition to the existing literature on this subject and may provide useful data which could form the basis for educational campaigns on rational use of Antimicrobials, thus addressing any misconceptions among the public.

OBJECTIVES OF THE STUDY

This study was aimed to assess public knowledge, belief and behavior towards Antimicrobials use in a general population in Northern Border Region in Saudi Arabia.

LITERATURE REVIEW

Over-use and misuse of antibiotics in animals and humans is contributing to the rising threat of antibiotic resistance. Some types of bacteria that cause serious infections in humans have already developed resistance to most or all of the available treatments. There are various factors which may influence an increase in irrational antimicrobial use. Many studies have reported that antimicrobial regime non-adherence and inappropriate antimicrobial use are strongly associated with public awareness and knowledge of Antimicrobials¹⁶⁻¹⁹. Factors associated with public knowledge of Antimicrobials have been reported to be demographic characteristics, including gender²⁰⁻²² age²³⁻²⁶, race²³ education level^{24,23-26} family income^{18,22} place of residence^{27,28} as well as other factors, such as lack of advice regarding rational antimicrobial use, given by a physician²⁹. Another important issue related to the increase in antimicrobial resistance is self-medication, which is defined as the acquisition of Antimicrobials and self-administering them (or administering them to children) with the aim of treating perceived infection³⁰. There are clear differences between the prevalence rates of self-medication with Antimicrobials among different European countries, ranging from 5% to 45%^{31,32} in the general population.

Appropriate use of Antimicrobials is essential to ensure treatment efficacy as well as to prevent resistance. Inappropriate use results from various factors and causes adverse effects including the emergence of resistance, adverse reactions, treatment failure, and waste of resources.³³ Non-compliance with antimicrobial treatment is a common phenomenon and this could definitely have an adverse impact on the success rate of treatment.³⁴⁻³⁷ The fact that Antimicrobials are commonly administered in response to community-acquired infections and most often in an outpatient setting is one of the contributing factors for antimicrobial non-compliance.³⁸ In a global patient survey of non-compliance with antimicrobial therapy for acute community infections conducted by Pechere et al. on 4,514 adult respondents from 11 countries, it was reported that 22% of participants admitted to non-compliance.³⁹ There are many potential barriers to compliance.⁴⁰ Studies conducted elsewhere have demonstrated inappropriate practices such as sharing of Antimicrobials,^{41,42} and the use of left over

Antimicrobials.^{39,42} Also, the purchase of Antimicrobials without valid prescriptions is quite prevalent in many countries.^{43,44} At times, inappropriate use of these agents reaches an extent that reports from a study conducted in Jordan revealed that Antimicrobials were used as analgesics and good number of the public use them as a prophylactic agent against infections.⁴²

The lack of knowledge of medication such as Antimicrobials may greatly influence the probability of misuse or compliance.⁴¹ There have been reports of a general lack of knowledge of correct antimicrobial use and a lack of public awareness on the basic principles of antimicrobial use, as well as indication for therapy.^{45,46} There are also common misconceptions regarding the use of Antimicrobials, especially for common indications like upper respiratory tract infections (URTIs), as it is believed that the use of Antimicrobials results in quick recovery and prevents more serious illness.⁴⁶⁻⁴⁸ Inappropriate or unwanted prescribing of Antimicrobials by clinicians happens to a great extent because they perceive that the patients need them. Addressing the public or patients' knowledge and belief on aspects of appropriate antimicrobial usage could help break the chain of misconceptions and expectations of effectiveness of Antimicrobials against minor illnesses.⁴⁹

METHODOLOGY

3.1. Research design and duration:

Descriptive cross sectional design was used to carry out this study for a period of four months from November 2017 to January 2018 .

3.2. Settings:

The study was conducted in different areas in Northern Border Region includes shopping malls and markets.

3.3. Sampling and Subjects:

A random sample comprised of 421 Saudi persons aged between 18 years and 60 years was used.

3.3.1. Inclusion criteria: i) Saudi population. ii) age is between 18 and 60 years. iii) living in Northern Border Area. iv) neither healthcare professionals nor students from any medical/health related field.

3.3.2.Exclusion criteria: i) persons who are not willing to participate in the study. ii) those with age less than 18 yrs or older than 60 yrs. iii) incompletely answered questionnaire. iv) healthcare professionals or students from medical/health related field.

3.4 Tool of data collection:

A structured questionnaire was designed for data collection by the researcher

3.5. Statistical analysis:

After all questionnaires being filled by participants, all data had been coded , entered into computer for analysis by utilizing MS EXCEL program.

Descriptive statistical analysis was used to determine frequency for each variable with representation for the results by figures.

3.6. Ethical considerations:

Saudi Participants population were informed about the nature of the study. Oral consent obtained from the study group who agreed to participate in the study. All participants were informed that their participation in the study is voluntary.

RESULTS

4.1.Demographic characteristic of participants

Totally the people who accepted to participate and answer the questionnaire were 469. After exclusion of 16 incompletely answered questionnaire, the totally included sample population who met all inclusion criteria were 453 participants.

Among the participants, the females represented more than half (67%) of the study group , while males represented less than half (33%) of the study population.

The distribution of demographic characteristics of study participants was shown in Table 1. Majority (78%) of participants' age ranged between 18 and 30 years. 65% of participants were highly educated and 29% with secondary education. Rafha and Arar cities represent the residence area for 47% and 13% respectively of the study participants.

4.2. Knowledge of participants toward antimicrobial use

About 27% of the respondents agreed that an indiscriminate and injudicious use of Antimicrobials will lead to an ineffective treatment, 29% agreed that it will lead to increased adverse effects, 24% agreed that it will lead to emergence of bacterial resistance,16% agreed that it will lead to exacerbation or Prolongation of illness and 4% agreed that it will lead to an

additional burden of medical costs to the patient. 65% of respondents agree that Antimicrobials are effective in treatment of bacterial infections and not effective for viral infection.

A majority, 78% (n=328) respondents were aware that if Antimicrobials were taken too often, they are less likely to work in the future. Only 23% (n=96) of the respondents were aware that bacteria were not responsible for causing colds and flu, while the remaining 77% (n=325) were not knowledgeable about this fact. 75% (n=314) were knowledgeable the fact that antimicrobial resistance is an important and serious public health issue. The Knowledge of respondents are shown in the (Table 2).

4.3. Attitude of participants toward antimicrobial use

More than half (57%) of respondents agree that they should take Antimicrobials to prevent getting a more serious illness when they had a cold. 47% of respondents agree that Antimicrobials helped them to get better more quickly when they got fever. More than half (54%) of respondents agree with the sentence "whenever I take an antimicrobial, I contribute to the development of antimicrobial resistance". Only 44% of respondents agree that skipping one or two doses does not contribute to the development of antimicrobial resistance and only 35% disagree with the sentence "Antimicrobials are safe drugs; hence they can be commonly used". Attitude of respondents which pertained to antimicrobial use represented in the (Table 3).

4.4. Medication practice among participants

When the participants asked "The doctor prescribes a course of antimicrobial for you. After taking 2-3 doses you start feeling better, 23% reported that they usually stop taking the further treatment, 23% reported that they usually save the remaining Antimicrobials for the next time they get sick, 38% reported that they sometimes discard the remaining, leftover medication. 39% sometimes give the leftover Antimicrobials to their friends if they get sick and only 16% reported that they complete the full course of treatment. only 24% reported that they always consult a doctor before starting an antimicrobial. Only 30% always check the expiry date of the antimicrobial before using it. 17% always prefer to take an antimicrobial when they have cough and sore throat. (Table 4)

4.5. Causes for the necessity to complete antimicrobial course.

The mentioned causes for completing antimicrobial course by the participants were complete killing of bacteria (63%), avoid bacterial resistance (41%), avoid allergy 28%, avoid recurrence of infection (53%) and increase immunity (35%). (Table 5

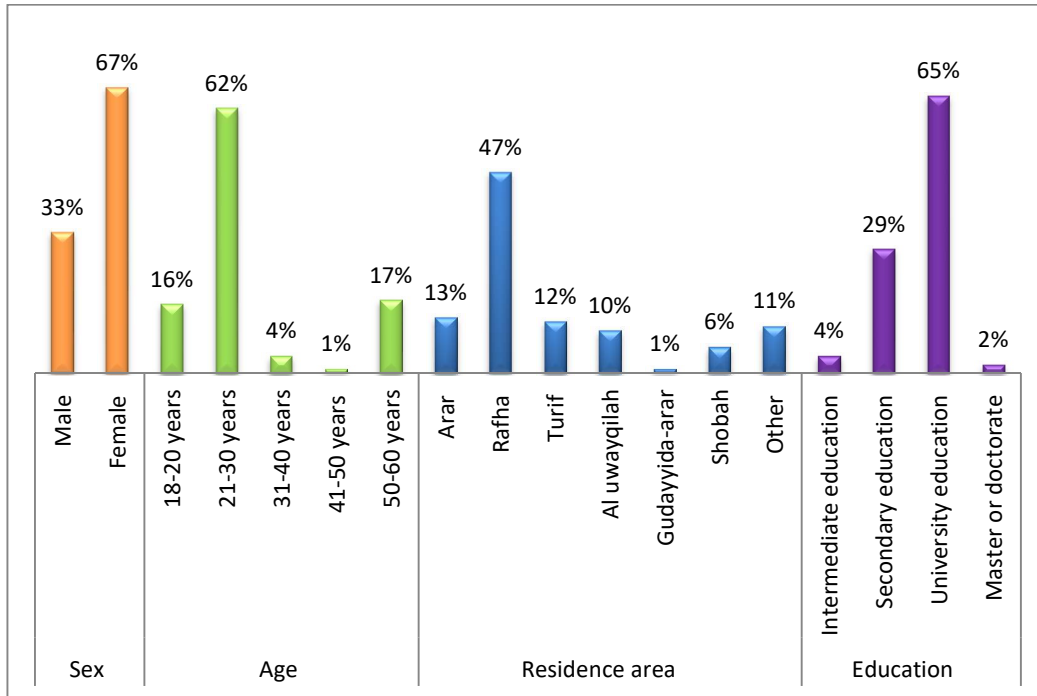


Figure 1. Demographic characteristics of study participant

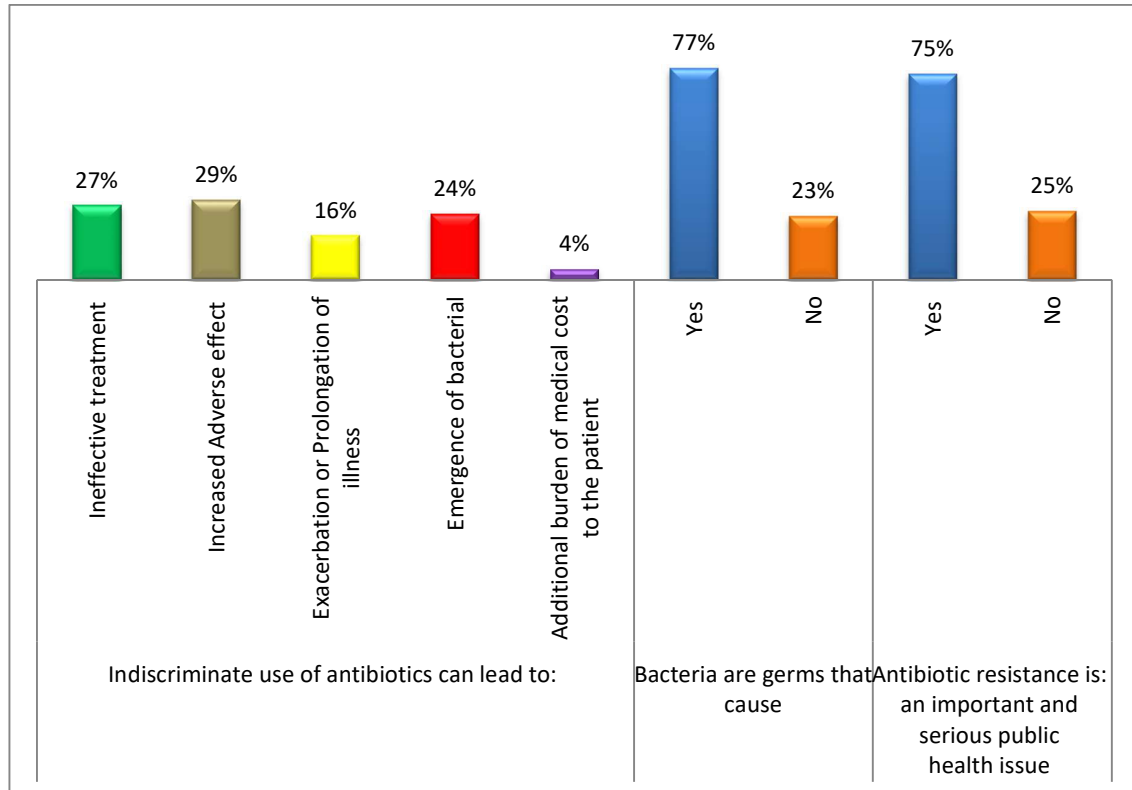


Figure 2 (a). knowledge of participants about antimicrobial use.

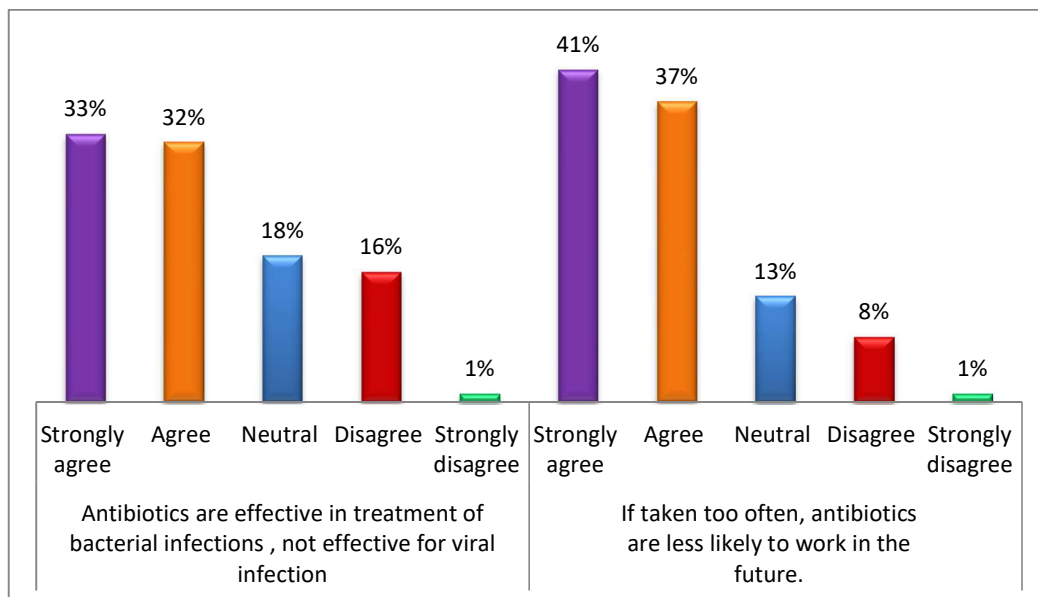


Figure 2 (b). knowledge of participants about antimicrobial use.

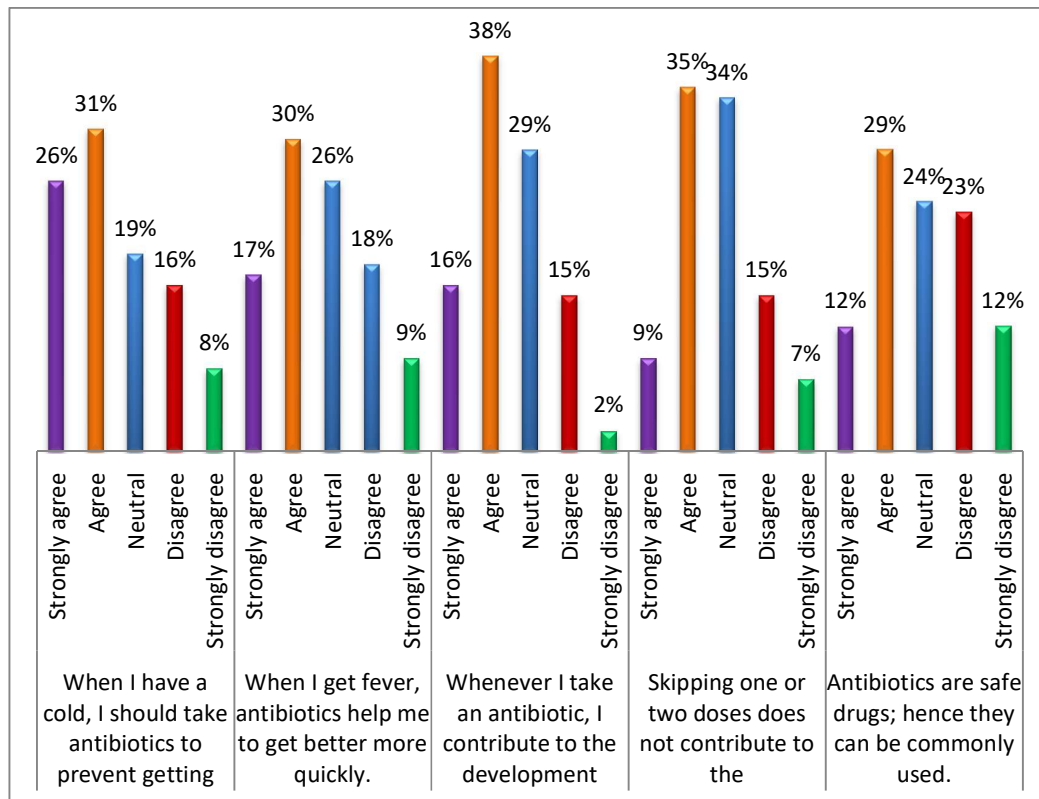


Figure 3. Attitude of participants toward Antimicrobials.

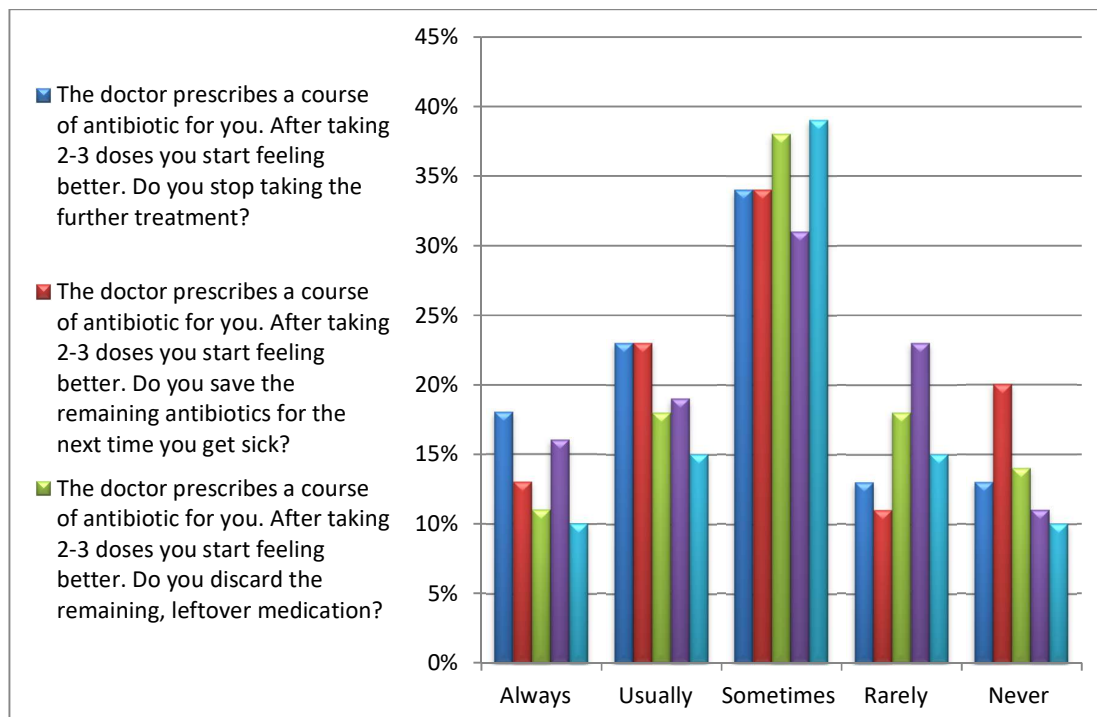


Figure 4 (a). Medication practice among participants

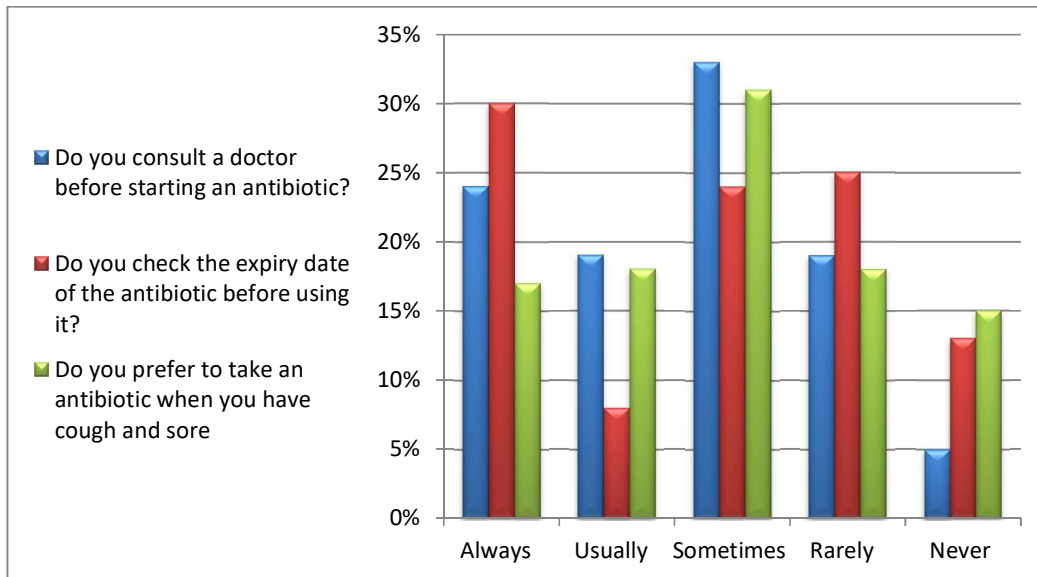


Figure 4 (b). Medication practice among participants

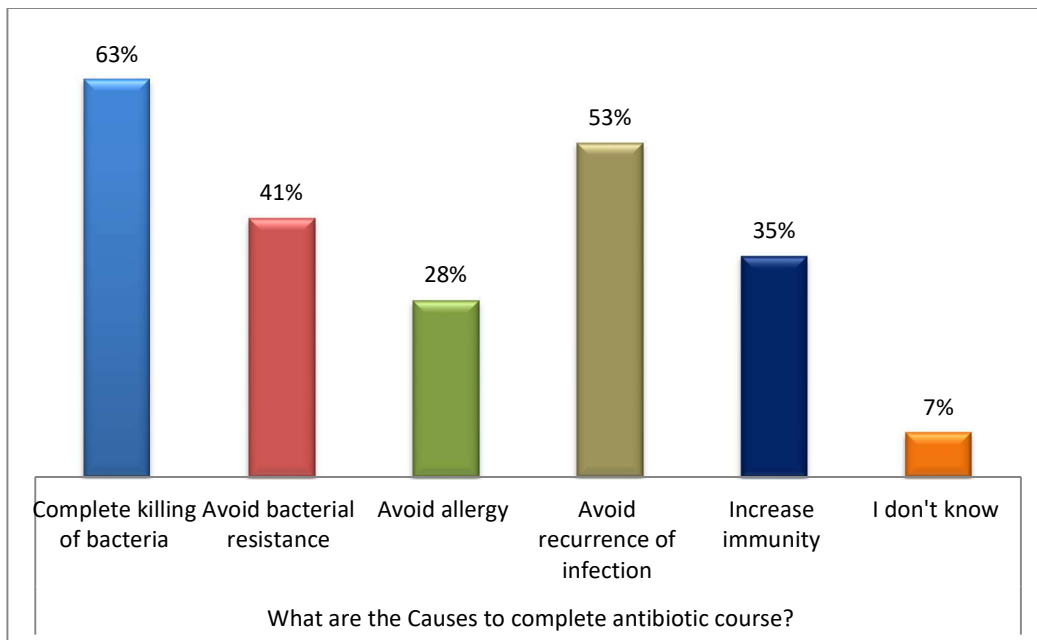


Figure 5. Causes mentioned by respondents for the necessity to complete antimicrobial course.

DISCUSSION

The present study conducted with the aim to assess public knowledge, belief and behavior towards Antimicrobials use in a general population in Northern Border Region in Saudi Arabia. Most of them (75%) were aware of worldwide problem of antimicrobial resistance which is inconsistent with previous studies where most of the participants did not give importance with the prevalence of the antimicrobial resistance.⁵⁰⁻⁵³ Education interventions using clinical problems which depicts the hazardous effects of antimicrobial resistance, can be used to improve as well as make them alert on present and future consequences, which encourages the correct usage of Antimicrobials by avoiding the resistance conquering the whole world.⁵²

There's some wrong beliefs noticed in the attitude of the respondents lead to inappropriate use of antimicrobial. 57% of them reported that Antimicrobials should be taken on developing a cold to avoid serious illness and 47 % of them believed that taking Antimicrobials on having a fever made them feel better more quickly. Similar reports were seen in another study.⁵³ 41% of participants believed that Antimicrobials were safe drugs and hence, they could be commonly used; and 35% considered it as not safe and 77% were not knowledgeable of the fact that bacteria were not responsible for causing cold and flu which was much higher than reported in previous study by Afzal et al ⁵⁴ (22.7% were not knowledgeable of the fact that bacteria were not responsible for causing cold and flu.). Previous studies have shown that about 60% and more of their participants believed that Antimicrobials should be prescribed during cold of viral etiology.⁵⁵ Such wrong and blind beliefs may lead to inappropriate antimicrobial consumption, which in turn result in the bacterial resistance because of irrational approach.⁵⁶ The common cold is a viral illness for which the etiology can be shown in most cases. i.e., Rhinovirus. Bacterial co-infections are very rare. Antimicrobial treatment is not necessary in otherwise healthy young adults with common colds.⁵⁷ In the present study, participants were found to be aware of the misuse and resistance of Antimicrobials, but also there's wrong belief and practices among many of them.

This present study showed that only 24% always consulted a doctor before starting on an antimicrobial which is higher compared with previous study indicated the rate of self-medication is 19% amongst public with respect to Antimicrobials.⁵⁸

In 2014, Belkina et al.⁵⁹ conduct a similar study showed that 38.8% of the respondents stop taking antimicrobial if they feel better. In comparison with our results, in this terms, only 18% always stop taking antimicrobial if they feel better. So, we have a better result this indicates that most of the respondents have a good awareness in this issue.

In the present study 15% , 10% rarely and never complete the course of antimicrobial respectively. A patient survey in 11 countries across the world showed that 22.3% of patients who received antimicrobial medication admitted to not finishing the therapy ⁶⁰. Moreover, patients may store Antimicrobials from uncompleted courses, even beyond the expiration date, and later self-administer these drugs for self-diagnosed conditions or dispense them to family members and friends ⁶¹⁻⁶³. In the present study 13%, 23% always and usually save the remaining Antimicrobials for the next time get sick respectively and 10%, 15% give the leftover Antimicrobials to friends or family members if they get sick respectively.

Strength and limitations of the study

This present study provides useful information about the knowledge, attitudes, perceptions of public with respect to antimicrobial resistance and usage, which may be utilized to plan suitable educational interventions that aim at improving the antimicrobial use and to correct false beliefs about Antimicrobials.

However the study have some limitations. The results of the study are based on self-reported behavior, which may not represent actual behavior. Also the high female-to-male ratio found in this study is not a truly representative value for actual gender distribution in the population.

CONCLUSION

There is great concern surrounding the development and spread of resistance resulting from poor knowledge about the dangers of self-medication and misuse of Antimicrobials . The study highlighted the need to educate population regarding the usage of Antimicrobials and

the complications of the misuses and what are the indications of Antimicrobials, use only doctor prescription to get Antimicrobials and also this study highlights the need to take decisive policy action to reduce non-prescribed antimicrobial use.

Measures to reduce non-prescribed antimicrobial use may include restricting the dispensing of Antimicrobials to prescription only, enforcing supervision by regulatory authorities, and implementing effective public information campaigns to encourage appropriate use of Antimicrobials.

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