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Knowledge, awareness and attitudes toward AB use and antimicrobial resistance among Medina population

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ABSTRACT

Background: Antibiotics (AB) resistance is a threat to public health and safety globally. The irrational use of ABs is alarming and steps must be taken to prevent AB resistance. The global issue of AB resistance has developed due to multiple factors related to inappropriate and uncontrolled dispensing use of AB. We aimed to measure the awareness of AB use and antimicrobial resistance among the Medina population. **Methods:** A descriptive cross-sectional study using a self-administrated questionnaire. Participants (aged ≥18 years) were invited to complete an online questionnaire through social media. A random sample of 412 participants was studied. **Results:** Out of 412 participants, 85% were females, 92.23% were Saudi's and 72% were bachelor's degrees. 23.3% of the studied population used ABs without a prescription in the past 12 months. The main reason for self-medication was saving time and effort (44.4 %). The primary sources of ABs were those purchased from community pharmacies (61.7%) and leftovers from previously prescribed pharmaceuticals (28.9%). 60.4% of participants heard about bacterial resistance. **Conclusion:** In conclusion, although most participants were aware of AB use, they had negative attitudes towards AB use, the dangers of self-medication and misuse and insufficient knowledge regarding AB resistance. Thus, continuous education and awareness campaigns must continue to ensure improvement in the knowledge of the population and awareness of AB resistance.

Keywords: Awareness, Knowledge, ABs, Antimicrobial resistance, KSA

1. INTRODUCTION

ABs is one of the most basic forms of antimicrobial substances in medical history, and their use virtually reduces the morbidity and mortality of bacteria (Aminov, 2010). In 1909, discovered the first AB by Paul frolic it is called (arsphenamine) and the brand name was marketed in 1911. They called it

(Salvarsan) and it is effective against syphilis. In 1928, Alexander Fleming discovered Penicillin accidentally when he noticed a fungus called *Penicillium notatum* inhibiting the growth of *Staphylococcus* in his forgotten colonies of *Staphylococcus aureus*. AB resistance is considered a significant public health issue, which is the ability of bacteria to survive and reproduce in the presence of ABs (Dugassa and Shukuri, 2017).

AB misuse can be performed through medication non-compliance or self-medication and is also related to the availability of ABs as over the counter medications without rules and regulations that prohibit such practice. There are four main mechanisms of AB resistance: (1) Enzymatic degeneration of the drug. (2) Change of the drug's target. (3) Reduced permeability of the drug. (4) Active export of the drug (Levinson, 2014). First, reduce the number of ABs taken by prevention to prevent infection and bacterial resistance. Second tracking, CDC (Centers for Disease Control and Prevention) gathers data on AB-resistant infections, causes of infections and if there are risk factors that cause some people to get a resistant infection (2019).

Objectives

The study objectives were to assess the knowledge, attitude and perceptions among adults' participants across Al-Madinah Al-Munawara, KSA

2. METHOD

Study design

This was a cross-sectional survey based on 412 participants (aged ≥ 18 years) from the Al-Madinah Al-Munawara population in KSA; The Study continued for four months.

Sample size

The sample size was calculated based on a confidence level of 95%, a significant margin of 5%, a population proportion of 62% and a population size rounded to 1300000 (Medina population). The estimated sample needed to achieve the significant outcomes was between 375 and 400 participants.

Inclusion criteria

Adult participants older than 18, living in Al Madinah Al-Munawara, signed approval on consent were captured from all participants and participants shall be able to answer the provided questionnaire themselves.

Ethics

Ethical approval was approved on March 07, 2022 from the general directorate of health affairs in Madinah. Institution review board for research ethics clearance approved the study under approval no (017-22).

Questionnaire development

The online questionnaire consisted of an electronic consent form and an option to agree or disagrees to participate, followed by two parts; the first part contains 21 questions and the second part contains 5 questions modified questionnaire (El-Hawy et al., 2017). The intention was to assess knowledge, awareness and attitudes toward AB use and antimicrobial resistance among Medina population. Demographic data were also collected.

Data analysis

Data analysis was performed using Statistical Package for the Social Sciences, SPSS and the 23rd version. Minimum, maximum, mean and standard deviation was all used to present the numerical variables. The frequency and percentages were used to make display the categorical variables. The Chi-square test was used to test for association between categorical variables. Independent t-tests and ANOVA tests were also used for factors associated with knowledge of AB. The level of significance was set at 0.05.

3. RESULTS

Baseline characteristics

A total of 412 participants were included in the study. Table 1 shows the social and demographic medical profiles of the participants. The mean age of our participants was 28.88 ± 11.229 (55.6 %) were age group (18-24), 96(23.3%) were age group (25-34), 29(7.0%) were age group (35-44) and 58(14.1%) were above 45. As for gender, 62 (15%) were males, while 350 (85%) were

females. 380 (92.2%) were Saudis, while 32 (7.8%) were non-Saudi. As for the education level, 3 (0.7%) had an education less than high school, 79 (19.2%) had a high school education, 297 (72.1%) had a bachelor's degree and 33 (8%) had a higher education (master / PhD). As for the medical history, 356 (86.4%) were medically free, 18 (4.4%) had asthma, 15 (3.6%) had diabetes mellitus, 14 (3.4%) had hypertension, 1 (0.2%) had kidney disease and 8 (1.9%) had other diseases.

Table 1 Demographical baseline characteristics (n=412)

Age	N	%
18-24	229	55.6
25-34	96	23.3
35-44	29	7.0
≥ 45	58	14.1
Gender		
Male	62	15.0
Female	350	85.0
Nationality		
Saudi	380	92.2
Non-Saudi	32	7.8
Education		
Less than high school	3	0.7
High school	79	19.2
Bachelor's degree	297	72.1
Higher education (master/PhD)	33	8.0
Medical history		
Medically free	356	86.4
Asthma	18	4.4
Diabetes mellitus	15	3.6
Hypertension	14	3.4
Kidney diseases	1	0.2
Other	8	1.9

Medical knowledge about ABs

Medical knowledge of ABs use in society among participants was included in Table 2; 77.4% of the participants agreed that ABs is used to cure bacterial infections and 30.8% agreed that they could cure viral infections. In addition, 42% of the respondents (n=173) believed that ABs could speed the recovery of the common cold and 9.5% (n=39) believed that ABs are more effective if they are newer or their prices are higher. It was also noted that 60.4% of the population (n=249) heard about bacterial resistance.

Table 2 Participants' knowledge assessment toward ABs (n = 412)

Does AB cure bacterial infections?	
Yes	77.4
No	22.6
Does AB cure viral infections?	
Yes	30.8
No	69.2
Does AB speed recovery?	
Yes	42.0
No	58.0
Would newer AB or those of high prices be more effective?	

Yes	9.5
No	90.5
Have you heard about bacterial resistance?	
Yes	60.4
No	39.6

Perceptions of participants towards AB

Participant’s perceptions of using AB were captured in Table 3; the participants' perception toward the main reasons for excessive use of ABs emphasized that 76 (18.4%) reported it was because of the difficulty obtaining necessary medical care, 107 (26%) reported it was because of their previous experience and 193 (46.8%) reported it was because of both. 36 (8.7%) thought it was because of other reasons (Figure 1).

Table 3 Participant’s perceptions towards the excessive AB use

	n	%
Difficulty in obtaining necessary medical care	76	18.4
Previous experience	107	26.0
Both	193	46.8
Other reasons	36	8.7

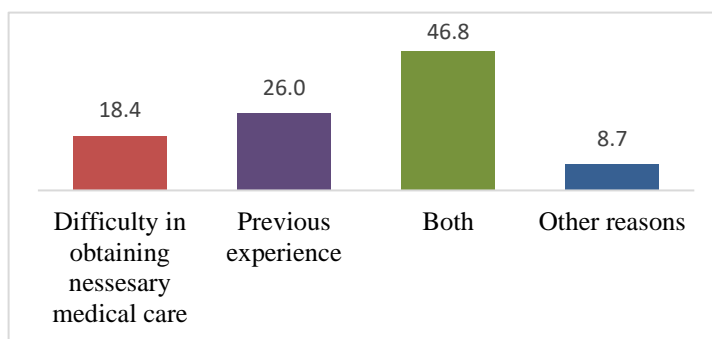


Figure 1 Participant’s perceptions towards the excessive AB use

Participant’s experience with un-prescribed AB

Participants' experience with un-prescribed use of AB was captured in Figure 2; the responses to the question "have you ever used an AB without a prescription in the last year?" were 96 (23.3%) reported that they had used ABs before without a prescription. In comparison, 316 (76.7%) reported never using ABs without a prescription.

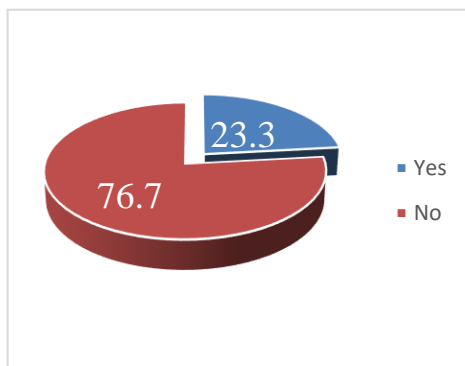


Figure 2 Participants' experience with un-prescribed use of AB

We analyzed the outcomes of the (23%) of participants who reported their use of AB without prescriptions aiming to understand more about the motives; outcomes were presented in Table 4, which illustrates the participant's experience with using ABs without any prescription. As for the number of times the participants had taken ABs without a prescription, 72 (75%) reported

using ABs without a prescription 1–3 times in the last year, 13 (13.5%) reported using it 4–5 times in the last year and 11 (11.5%) reported using it for more than 5 times.

The reasons for using ABs without prescription were to save time and effort 58 (14.1%) did not want to see a doctor, 45 (46.88%) to save money, 21 (21.88%) and 7 (7.29%) had other reasons. The underlying reasons for the participants to treat themselves with ABs were sore throat with fever for 52 (54.17%), runny nose with cough for 29 (30.21%) and nasal congestion for 25 (26.04%) (Figure 3). The basis on which the participants chose the ABs were from previous experience for 48 (50%), a recommendation from the pharmacist for 46 (47.92%) and a previous prescription from a doctor for 41 (42.71%) (Table 4)

In terms of things the participants care about when choosing an AB, the outcomes vary between 69 (71.88%) reported caring about the indication of AB use, 37 (38.54%) reported caring for the type of AB and 32 (33.33%) reported caring about the AB side effects. Most participants reported receiving ABs from a private pharmacy 66 (68.755). In contrast, 31 (32.29%) reported it was from the leftovers of a previously used package and 5 (5.21%) reported it was from other sources (Table 4).

Table 4 Participants' experience with the use of ABs without prescription (n = 96)

	N	%
How many times have you taken an AB in the last year?		
1 - 3 times	72	75.0
4 - 5 times	13	13.5
More than 5 times	11	11.5
Reasons for using the ABs without prescription		
Save time and effort	58	60.4
I do not want to see a doctor	45	46.9
Saving money	21	21.9
Other	7	7.3
What are the reasons for treating yourself with ABs without a prescription?		
Nausea, vomiting and diarrhoea	22	22.9
Fever less than 39°C	15	15.6
Skin wounds (except for superficial ABs)	9	9.4
Body ache with fever	5	5.2
Sore throat with fever	52	54.2
Runny nose with cough	29	30.2
Nasal congestion	25	26.0
Others	8	8.3
Your choice of ABs depends on		
From my previous experience	48	50.0
Recommendation from the pharmacist	46	47.9
A previous prescription from a doctor	41	42.7
Family opinion	32	33.3
Friend's opinion	5	5.2
From websites that contain prescription	5	5.2
From advertisements	1	1.0
What do you care about when choosing an AB		
Indications for the use of the AB	69	71.9
Type of AB	37	38.5
AB side effects	32	33.3
Price of AB	6	6.3
Brand of AB	4	4.2
Others	2	2.1
From where did you get the AB you used?		

Private pharmacies	66	68.8
Leftovers from packages then used previously	31	32.3
Free samples of representatives	3	3.1
I bought it from the Internet E-pharmacies	2	2.1
Others	5	5.2

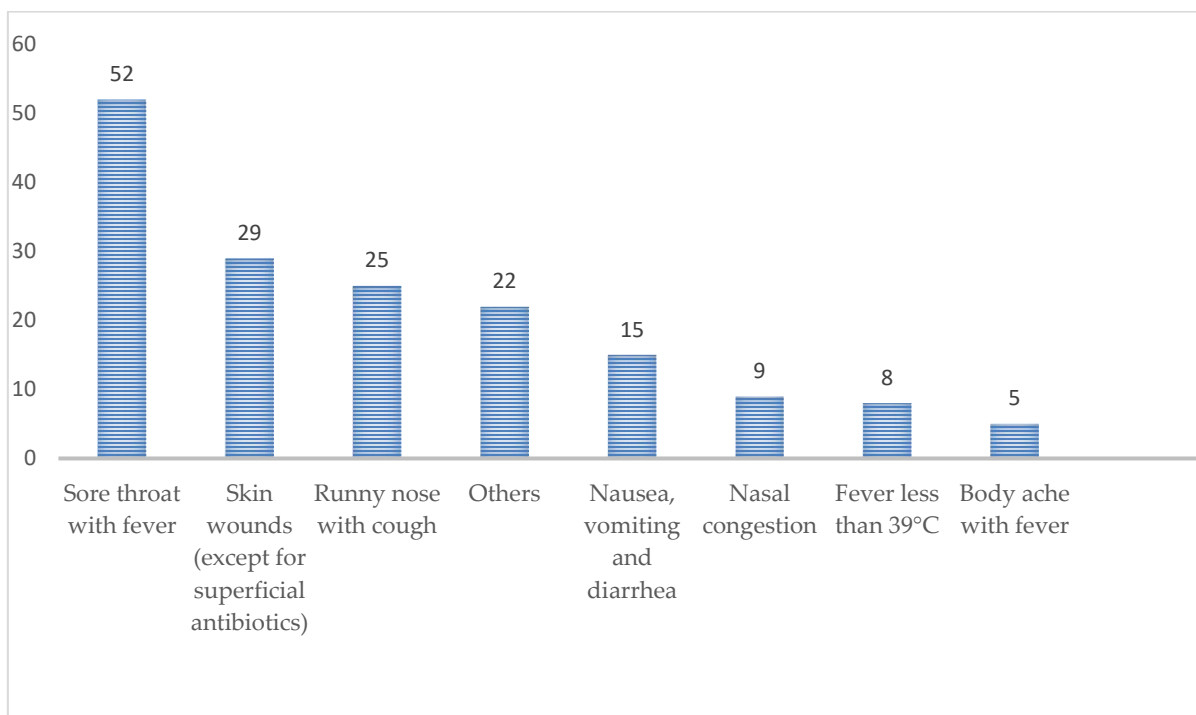


Figure 3 Reasons for treating themselves with antibiotics without prescription

Intentional Change in AB treatment course

Participants were offered to report if they had intentionally changed the AB treatment course, either duration or type, without professional advice; among the 412 participants, 35 (8.5%) reported they had previously intentionally did change the type or dose of AB during the treatment without professional advice. In contrast, 377 (91.5%) reported never doing (Figure 4).

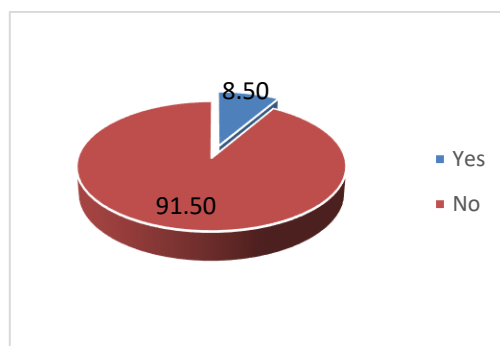


Figure 4 Participant’s intentionally change AB treatment course (without physician advice)

Out of the total participant sample, 35 participants (8.5%) have shared earlier that they intentionally changed the AB course either duration or type without professional advice Table 5, the most reported reasons were that the AB did not work (5.29%), reducing side effects (22.86%) and that the last AB being expired (11.43%). As for how the participants calculated the AB dose, the most reported answers were through reading the leaflet of the package that comes with the AB (48.57%), through some advice from a doctor (40%) and consulting a pharmacist (34.29%). With regards to stopping taking the AB, 40% after the prescribed treatment period has ended 14 (40%), stopped after consulting a doctor/pharmacist 9 (25.71%) and stopping after several days regardless of the results 8 (22.86%)

Table 5 Participants intentionally changing AB course (n = 35)

	N	%
Reasons for Intentionally Changing the Type or Dose of the AB During Treatment (Without Professional advice)		
The previous AB did not work	19	54.3
To reduce its side effects	8	22.9
The previous AB has expired	4	11.4
Other ABs are cheaper	1	2.9
Others	3	8.6
How did you calculate the AB dose?		
Read the leaflet that comes with the AB package	17	48.6
With the advice of a doctor	14	40.0
Consulting a pharmacist	12	34.3
Consultation with family members/friends	5	14.3
From Internet	5	14.3
From newspapers, magazines, books or TV shows	3	8.6
I estimate the dose myself	3	8.6
From my previous experience	2	5.7
Usually, when do you stop taking the AB?		
After the prescribed treatment period has ended	14	40.0
After consulting a doctor/pharmacist	9	25.7
After several days, regardless of the result	8	22.9
After symptoms disappear	8	22.9
After the course of the AB is finished	7	20.0
After several days of the disappearance of symptoms	6	17.1

Participants' attitude with AB leaflets instruction and side effects

The participants' attitudes towards reading the AB leaflet and handling AB side effects were reported in Table 6. Of the 412 participants, 306 (74.3%) reported reading the leaflet with the AB package, while 106 (25.7%) reported not reading the leaflet. For those who reported reading the leaflet that comes with the AB package, 16 (5.2%) reported understanding 0–25% of the instruction in the leaflet, 46 (15%) reported understanding 25–50% of the instruction, 117 (38.2%) reported understanding 50–75% of the instruction in the leaflet and 127 (41.5%) reported understanding 75–100%. Among the participants, 97 (23.5%) reported experiencing side effects, while 315 (76.5%) reported never experiencing side effects.

Table 6 Participant’s attitude towards AB leaflets and handling side effects

	N	%
Have you ever read the leaflet that comes with the AB package?		
Yes	306	74.3
No	106	25.7
For those who have read the leaflet, How many percent did you understand the instructions for use? (n = 306)		
0-25%	16	5.2
25-50%	46	15.0
50-75%	117	38.2
75-100%	127	41.5
Have you experienced any side effects with the use of the AB?		
Yes	97	23.5

No	76.5	76.5
For those who experienced side effects, what did you do? (n = 97)		
I stopped using ABs	22	22.7
Change the type of AB	16	16.5
Consult the pharmacy staff	9	9.3
Consult family/friends	2	2.1
I consulted the doctor	31	32.0
Nothing	17	17.5
Do you keep AB residues longer than the treatment period		
Yes	57	13.8
No	355	86.2

For those who experienced side effects, 31 (32%) reported consulting the doctor, 22 (22.7%) reported stopping the ABs, 16 (16.5%) reported changing the type of the AB, 9 (9.3%) reported consulting a pharmacy staff, 2 (2.1%) reported consulting a family/friend and 17 (17.5%) reported not doing anything (Figure 5). Concerning keeping AB residue after the treatment period, 57 (13.8%) participants reported keeping the AB residues after the treatment period, while 355 (86.2%) did not (Table 6).

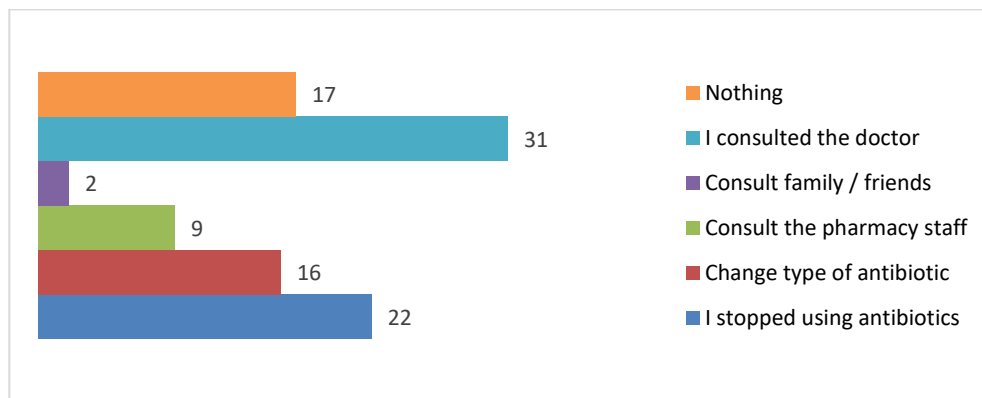


Figure 5 Participant's action when suffering side effects

Factors related to ABs use without a prescription

Several factors were observed concerning ABs use without a prescription. Outcomes are presented in Table 7 shows the factors that had been associated with using ABs without any prescription. Nationality was significantly associated with the use of ABs without prescription ($p < 0.001$), where it was observed that non-Saudi participants had a higher rate of using ABs without prescription compared to Saudis (53.1% vs. 20.8%). Gender, age and education were not significantly associated with using ABs without a prescription.

Table 7 Factors impacting the use of AB without prescription

Factors	History of ABs use without a prescription		
	Yes	No	P value
Age			
Mean age + Standard deviation (SD)	30.39 +12.33	28.43 +10.82	0.138
Gender (n, %)			
Male	19 (30.6%)	43 (69.4%)	0.138
Female	77 (22%)	273 (78%)	
Nationality			
Saudi	79 (20.8%)	301 (79.2%)	< 0.001*
Non-Saudi	17 (53.1%)	15 (46.9%)	

Education			
Less than high school	1 (33.3%)	2 (66.7%)	0.597
High school	22 (27.8%)	57 (72.2%)	
Bachelor's degree	64 (21.5%)	233 (78.5%)	
Higher education (master/PhD)	9 (27.3%)	24 (72.7%)	

4. DISCUSSION

Several studies have reported AB misuse worldwide. However, this is the first published study to measure knowledge, awareness and attitudes toward AB use and antimicrobial resistance in the Medina population of Saudi Arabia. The questionnaire was previously used and modification was made to make the questionnaire fit our society's customs and cultures (Omit specific questions for child caregiver that does not match our research criteria). The participants were approached for the study through social media. Despite the time and effort constraints of collecting data using a self-administered questionnaire by participants in the presence of the research team, the researchers ensured that questions were adequately understood by the participants and assured the efficiency and accuracy of the data obtained. Our paper showed that most of the participants were Saudi 92.23% and there was an overrepresentation of the female gender in the sample taken 85%.

Among ordinary people, knowledge and attitudes towards accurate AB usage have played an essential role in limiting AB resistance. In this study, we have assessed the knowledge and attitudes of the population in Medina toward AB usage. Regarding the knowledge level, the majority of the participants, 72.10%, had a bachelor's degree. The study findings showed that 77.7% of participants could identify that ABs help treat bacterial infections, whereas 30.8% thought that they could cure viral infections. This knowledge gap could be the cause of AB self-medication. It also noted that 60.94% of the population heard about bacterial resistance.

According to the knowledge score, it was found to be 66.64% in our study was poor in another study and could reach around 33%. This knowledge proportion is higher than in other Study in Alkharj, an investigation by (Alqarni and Abdulbari, 2019), which showed that 73.4% of the participants had a university education and the level of knowledge was poor in 48.9% of the participant. They reported that 46.8% of the study participants believed that ABs were effective against viral infections, while 64.3% believed they were effective against bacterial infections.

Being a healthcare worker, employed, married, having a high educational level and having a high income was significantly associated with higher scores. Also, the study was done at King Saud bin Abdulaziz University (Zaidi et al., 2020). About 63% of the students had a low level of knowledge. About 69.7% correctly knew that ABs had been indicated for treating bacterial infections. However, about 36% of the student's thought ABs were also used to treat viral infections, but 28.5% needed to be sure. Our results agreed with another study (Alnasser et al., 2021). 56.9% of participants reported that ABs should not be used to treat viral infections. 70.3% of the respondents agreed that reducing the inappropriate use of ABs plays an essential role in the prevention of resistance of bacteria to AB's usage.

However, lack of awareness is a leading factor in the misuse of ABs worldwide (Dugassa and Shukuri, 2017). According to our findings, 23.3% of the participants used ABs without a prescription 1-3 times in the previous year. The primary cause behind the self-medication attitude was the prevalence of some knowledge disorders and misconceptions about AB use and resistance. Where 42% agreed ABs could cause speedy recovery from the common cold and only 61.4% heard about AB resistance. In addition to the misconceptions, the accessibility of ABs to the general population in community pharmacies and the economic status and beliefs reported by the patients in many studies are among the other reasons. The participants in our study reported that most of the sources for self-medication were either their community pharmacy 68.75% or medication leftovers 32.29%. Although the prevalence of self-medication attitude in the population, the patients were more cautious when it came to the dose administered. Most would consult a healthcare professional or read the pamphlet before taking their medications. On examination of the other attitudes relating to AB misuse and resistance, at least 65.62% of our self-medicated study had reported non-compliance to complete the therapy duration. This increases the emphasis on the pharmacist's role in patient education relating to bacterial resistance and best practices with AB therapy and some drug interactions with other medications, such as oral contraceptives and age restrictions.

Like our results, in another study in the Asser region, 63.6% of the participants reported ABs without a prescription from pharmacies and found that 81.4 % of people believed they could self-prescribe ABs instead of seeing a doctor when they had a minor sickness. A study conducted in 2016 among the Saudi population assessed AB misuse (Kurdi et al., 2020). They also stated that 71.1% did not complete the AB course because they felt better; however, 15.4 % of our study stopped taking the medication regardless of the outcome. 44.7 % of our participants reported keeping leftover ABs from this continued course of treatment for

future use, whereas 13.8 % reported keeping AB leftovers after the treatment period. Both researchers agreed to read the ABs package booklet before using them. ABs should be obtained according to a doctor's prescription, according to 94.4% of respondents. Both studies agreed that a physician should provide ABs with access restrictions (Kurdi et al., 2020).

Our study found that the primary reasons for excessive AB use were difficulty obtaining necessary medical treatment and experience 46.8%. 25.8% of their choice of ABs is based on the pharmacist's recommendation. In comparison, review articles for twenty-two studies conducted in the Middle East Alhomoud et al., (2017) found that the prevalence of self-medication with ABs ranged from 19% to 82 %. The most common medicines used were penicillin's; self-medication with ABs was primarily for upper respiratory tract illnesses; our participants used ABs primarily for sore throat and fever 54.17%.

Regarding attitude, our study showed that 76.7% reported never using ABs without a prescription and only 23.3% used self-medication. Another study used a cross-sectional survey of 1095 participants (Hjajalenzazi et al., 2020). We were reported 43% using self-medication, while the study showed that 63% reported taking ABs according to instructions. Also, it notes that 39% reported taking advice about ABs from pharmacists and private pharmacies. The prevalence of non-prescription use of ABs is around 3% in developed countries and about 100% in developing countries (Morgan et al., 2011). On April 17, 2018, Saudi MOH mandated that all pharmacies must not dispense ABs without a prescription (Alnasser et al., 2021). Consequently, any pharmacy that dispenses ABs without a prescription is subjected to a fine of up to 100,000 Saudi riyals, revocation of the license and imprisonment for up to six months (Morgan et al., 2011). Such regulations significantly reduced over-the-counter selling of ABs from 70.7% to 12.9% after law enforcement.

The second study used a cross-sectional survey of 350 participants. The study was conducted in a maternity and children's hospital in Al-Medina city, Saudi Arabia, in 2015 to assess the pattern of un-prescribed usage of ABs for children among the Saudi population attending this hospital and to assess their knowledge, awareness beliefs about this problem (Abdoh et al., 2015). The study shows that 48.6 % reported using un-prescribed ABs for their children. The level of attitude is low in their study as it was done before the implantation of the law. Regarding awareness, higher to our results a cross-sectional study of 1310 participants (El Zowalaty et al., 2016). 48.1% of participants agreed they could use ABs to cure viral infections.

63.6 % of our participants reported purchasing ABs without prescriptions from pharmacies; 71.1 % reported that they did not complete the AB course as they felt good. The availability of ABs without prescription was found to have been associated with self-medication. Another cross-sectional study of 825 participants was conducted to determine the association between awareness of AB resistance and AB misuse among Saudi university students (Bu-Khamsin et al., 2021). More than 75% of university students were fully aware of AB resistance (95% CI: 72.09% - 77.98%), while 54.67% (95% CI: 51.26% - 58.03%) were aware that AB resistance is a significant public health problem.

This study should consider the limitations that may affect the interpretation of the findings and thus impact its conclusion. The study was conducted online and gender ratio, even though efforts were made to obtain matched gender ratio, in the study sample indicates an over-representation of female participants, denoting selection bias. Thus, generalizing the results to a large scale may need more validity. Second, most of the study participants had a high academic level. Third, people who do not have access to the internet or devices may have been excluded from the study. Another limitation is the nature of the study cross-sectional which reflects participant knowledge and attitude toward ABs at one point. A change in knowledge and attitude may need to be assessed by the longitudinal study of the same group after intense public education about AB resistance. A larger sample size and face to face questionnaires are needed to assess AB awareness's effects on antimicrobial agents' use. Using online surveys and cross-sectional designs may have also limited the transparency of reporting the actual findings.

5. CONCLUSION AND RECOMMENDATION

The current findings provide helpful information for determining ABs use awareness in Medina is comparable with other cities within Saudi. This study revealed that the use of ABs decreased, but several people still use them without a prescription. However, there is a law prohibiting dispensing ABs without any prescription. Knowledge, awareness and attitudes toward AB use and antimicrobial resistance in the Al-Medina population were moderate, with 66.94% of participants scoring an excellent level of knowledge. The participants had misconceptions regarding AB use indications, which might be a factor in unnecessary prescriptions. Better communication between physicians and patients toward understanding the actual difference between viral infection and bacterial infections may increase the knowledge and positive attitude regarding ABs, leading to decreased patient demand and appropriate prescription.

Therefore, our study suggests carrying out educational programs and awareness campaigns to increase the knowledge about AB resistance and proper use of ABs, increase surveillance of ABs dispensing and increase access to primary health care to reduce

self-medication with AB. Another possible intervention is the government's use of social media to deliver appropriate knowledge about ABs and the adverse effects of their overuse.

Author Contributions

Lobna Mohamed Hassan, Renad Talal Alkaki, Sibaa Hameed Alsuhaymi, Omnyah Abdulrzaq Sanyour, Ghofran Salem Alhejaili, Hanin Mohammed Mulla, Lama Ahmad Azali Amara contributed protocol design, data collection in the study all authors wrote the manuscript and the approved the final version of the manuscript.

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Ethical approval

The general directorate approved the study of health affairs in Madinah, Institution Review Board, for research ethics clearance (017-22).

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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