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Knowledge, Attitudes and Practices about Antibiotics usage: A study in Hebron governorate among Palestinian Pharmacy students

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المعرفة والمواقف والممارسات حول استخدام المضادات الحيوية: دراسة في محافظة الخليل بين طلاب الصيدلة الفلسطينيين.

الملخص

صممت هذه الدراسة لتقييم المعرفة والمواقف والممارسات (KAP) لطلاب الصيدلة في جامعة الخليل فيما يتعلق بمعرفة المضادات الحيوية، واستخدامها، والمواقف تجاهها، من أجل تحسين الاستخدام الرشيد للمضادات الحيوية. حيث يساعد ذلك في تصميم البرامج التعليمية المناسبة للطلاب في الكليات الطبية.

في هذه الدراسة، كان معظم الطلاب (90٪) على دراية بالمشكلة الناشئة لمقاومة المضادات الحيوية بسبب الاستخدام غير المناسب للمضادات الحيوية. كان متوسط درجات المعرفة والموقف والممارسة تجاه استخدام المضادات الحيوية بين الطلاب 8.85 ± 1.01 و4.93 ± 1.11 و4.55 ± 1.09 على التوالي.

أظهرت النتائج معرفة جيدة بالمضادات الحيوية بين الطلاب. كان لغالبية الطلاب موقف جيد وممارسة جيدة تجاه استخدام المضادات الحيوية. رغم ذلك يجب توفير تدريب تعليمي مناسب لطلاب الصيدلة المستقبليين فيما يتعلق بالوصف السليم للمضادات الحيوية واستخدامها.

Abstract

The study was designed to assess the Knowledge, Attitude and Practices (KAP) of pharmacy students at Hebron University with regards to antibiotic knowledge, usage, attitudes., and to improve the rational use of antibiotics. It can help in designing appropriate educational programs for students in medical colleges.

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Knowledge, Attitudes and Practices ….

In this study, most (90%) of the students were aware of the emerging problem of antibiotic resistance due to inappropriate use of antibiotics. The mean knowledge, attitude and practice score towards antibiotics use among students was 8.85±1.01, 4.93±1.11 and 4.55±1.09 respectively.
The results showcased a good knowledge of antibiotic among students. The majority of the students had good attitude and practice towards antibiotics use. Adequate educational training should be provided to future pharmacy students regarding proper prescribing and usage of antibiotics.

Introduction

Antibiotics are drugs used to treat infections, which were discovered in 1940 (Mohr, 2016). A large number of antibiotics was produced, and this class is considered one of the most widely used drugs now (Sakeena et al., 2018).

The effectiveness of antibiotics has decreased significantly due to widespread misuse, as the World Health Organization (WHO) has shown in recent years an exacerbation of the problem seen as emergence of strains of bacteria resistant to various antibiotics, which is a major concern due to consensus that this is associated with increased antibiotic resistance (Fejza et al., 2016).

The main factors contributing to the self-management with antibiotics in developing countries such as Palestine are over the-counter availability, prescription on demand and high cost and limited availability of the hospitals or healthcare consultation (Fischbach et al., 2009). A high prevalence of self-medication with antibiotics has been found to increase levels of antibiotic resistance (Masri, 2016).

Changing the behavior of consumers and antibiotic providers can help significantly control antibiotic resistance. Health care students can play a crucial role in reducing inappropriate use of antibiotics by raising awareness of the correct use of antibiotics (Grigoryan et al., 2010).

In this context, an increasing number of research reports in the literature have focused their attention on the investigation of knowledge; attitude and practices (KAP) of medical students towards the use of antibiotics (Shrestha, 2019). In Kosovo, in 2016, a study by Fejza et al,reported good and a moderate knowledge of pharmacy students regarding antibiotics (Fejza et al., 2016).

A similar study conducted at Al– Najah National University in Nablus by Masri et al (2018) on pharmacy students reported a good knowledge regarding antibiotic use (Masri, 2016).

Another study conducted in a tertiary care hospital in Nepal by Shrestha in 2019 reported that half of the students had good attitude, majority had moderate knowledge and practice towards antibiotics use (Shrestha et al., 2019).

A survey of 1200 medical and non – medical students in United Arab Emirate by Jairoun et al (2019) indicated that medical students performed better than non–medical students in terms of knowledge and attitude towards antibiotic use (Jairoun et al., 2019).

According to another study conducted at a Sri Lankan university by Sakeena et al (2018) among pharmacy and health sciences students to investigate knowledge related to antibiotics, pharmacy students demonstrated better knowledge and understanding regarding antibiotic use than allied health sciences students (Sakeena et al., 2018).

A survey of pharmacy students in Trinidad and Tobago by Ahmad et al (2015) showed that they had sufficient knowledge, but poor attitude regarding antibiotic use (Ahmad et al., 2015).

In Congo a study performed by Thrieme et al (2013) on medical doctors and students reported a low knowledge about antibiotic (Thriemer et al., 2013).

Hebron governorate (HG) is the largest governorate in the occupied Palestinian territory and is located in the south of the West Bank with a population of approximately 870,000. At least 85% of the people live in urban areas, 12% in rural areas, and 2.7% in refugee camps. Around 40% of the population is under 40 years of age.

The College of Pharmacy at Hebron University established in 2012 has a five-year degree program and students, after receiving their degree, get the right of working or having their own Pharmacy or Drug Store. Considering this, their knowledge attitude and behavior in relation to public usage of the antibiotics can have a great impact in the future on antibiotic-related issue in Palestine.

The knowledge and behavior of these students regarding antibiotics will have a noticeable impact on the Palestinian healthcare system.

Knowledge, Attitudes and Practices ….

Method

An English language KAP survey was used to assess undergraduate pharmacy students at the largest university in Hebron. A descriptive cross-sectional questionnaire-based design was applied. The study was conducted by using an online questionnaire (Google form) among undergraduate pharmacy students at Hebron University during the period January – March, 2021, n=175.The online questionnaire was developed with several sections, where the objectives of the study were mentioned on the first page.

In this study, we investigated the KAP of Hebron university health care students. The study was conducted according to the human research ethics.

The population was randomly selected for the quantitative survey with a total number of 175 participants (95% response rate). The participants aged 18 to 24 years.

An extensive literature review was conducted, while different scientific search engines were explored for relevant articles for the questionnaire design. The instrument contained 23 questions divided over four sections including socio-demographic data, knowledge about antibiotic use, attitude and practices toward antibiotic use.

In knowledge section, ten questions covered such points as asking about allergic reaction, antibiotics can kill good bacteria etc. The total knowledge score ranged from 0 to 10, with a higher score denoting a better knowledge. Items were evaluated for internal reliability, using Cronbach's alpha. The Cronbach alpha coefficient was 0.84, indicating good internal reliability.

In the attitude section, there were six questions with a Cronback alpha coefficient of 0.80.

In the practice section, five questions enquired about completing the full course of treatment, thoughts about expiry date of the antibiotic, etc. The Cronbach alpha coefficient for attitudes was 0.81, indicating acceptable internal consistency.

The knowledge and attitude questions were answered Yes/No / "I don't know". Incorrect or "I don't know" responses were given a score of zero, and correct answers were assigned a score of one (i.e., the scores for knowledge of the participants were considered by assigning one point to

each correct item, either "yes" or "no"). A higher score of knowledge or attitude indicates a better performance in that domain.

Student's self reported practices and perception regarding antibiotic usage was also assessed using Likert scale with options of "always= 3", "sometimes=2" and "never=1." Similar Likert scales evaluation was used to assess the study participants' practices and habits. In the practices section, those who got high scores were considered as having good intention for practice for antibiotics use.

Statistical analysis

The data were analyzed using the Statistical Package for Social Sciences SPSS (version 26). Frequency distribution and percentage of independent variables (sociodemographic characteristics and study characteristics) were computed for all 175 participants. One-way analysis of variance (ANOVA) and Independent- samples t test was used to assess differences in mean values for KAP scores whereas significance was considered at a p-value<0.05.

Results

The personal characteristics (including number and percentage) for the subjects are demonstrated in Table 1. The mean age of respondents was 21.1 ± 5.24years, 65% were female. Most of the respondents live in cities (48.1%). The student academic level of the subjects were as follows: 25.5% second year, 27.1% third year, 29.5% fourth year and 17.5% fifth year. There were no significant differences in demographic variables (p>0.05).

Table 1: Demographic characteristics of participants and KAP score of antibiotic (n=175)

			Knowledge score (0-10)		Attitudes score (0-6)		Practices score (0-5)	
Variable	**N**	**%**	**(Mean ± SD)**	**P-value**	**(Mean ± SD)**	**P-value**	**(Mean ± SD)**	**P-value**
Gender								
Male	87	35	8.50 ± 1.0	0.11	5.05±1.20	0.04	4.21±1.12	0.19
Female	164	65	8.70 ± 1.6		4.02±1.01		4.23±1.14	
Residence								
City	121	48.1	9.05 ± 1.20	0.37	5.06±1.32	0.22	3.51±1.22	0.31
Village	77	30.6	8.65 ± 1.11		5.02±1.29		3.49±1.11	
Camp	53	21.3	8.55 ± 1.08		4.79±1.18		3.45±1.17	
Student academic level								
Second year	64	25.5	8.45 ± 1.18	0.03	4.55 ± 1.87	0.01	3.55 ± 1.78	0.01
Third year	68	27.1	8.53 ± 1.06		4.51 ± 1.89		3.52 ± 2.02	
Fourth year	74	29.5	8.65 ± 1.38		4.70 ± 1.90		3.65 ± 1.98	
Fifth year	44	17.5	8.84 ± 1.79		4.89 ± 2.02		3.71 ± 1.01	
Total score			8.85±1.01		4.93±1.11		4.55±1.09	

From Table 1, the mean KAP score among students in this study was 8.85±2.01, 4.93±2.11 and 4.55±2.09 respectively. We believe that students' KAP about antibiotics will be good and will increase as the student's academic level is higher.

Assessment of Knowledge of Antibiotics

The mean antibiotics knowledge score was 8.85 (SD: 2.01, range: 0-10), suggesting an overall 88.5% (10.05/10*100) correct rate on this knowledge test. Most participants were able to obtain scores above mean=8, representing acceptable level of knowledge about antibiotics. Knowledge scores were not statistically significant across all the demographic variables if p-value<0.05) (Table 1) except Student Academic level. As expected, final year students had good knowledge, p-value 0.02. Generally, the participants had good knowledge of certain aspects of antibiotic use. The participants were also able to identify antibiotic and the using time of it (Table 2).

Question	Yes n(%)	No n(%)	I don't Know n(%)
Will the antibiotic work better if it is newer or more expensive?	4(2)	165(94)	6(3)
The effectiveness of treatment is reduced if a full course of antibiotic is not completed ?	169(96)	5(3)	1(1)
One can stop antibiotics as soon as complaints lessen	11(6)	154(88)	10(6)
Do you think the antibiotic works to help speed up cold, cough recovery?	11(6)	158(90)	6(4)
Antibiotics can cause allergic reaction ?	161(92)	11(6)	3(2)
Antibiotic can kill good bacteria present in our body	169(96)	3(2)	3(2)
antibiotics be used to cure infection caused by bacteria	158(90)	10(6)	7(4)
antibiotics be used to cure infection caused by viruses	9(3)	169(96)	1(1)
Antibiotics resistance occurs when bacteria become resistant to antibiotics	172(98)	3(2)	0
Antibiotics resistance occurs when people become resistant to antibiotics ?	11(7)	158(90)	6(3)

Knowledge, Attitudes and Practices ….

Table 2: Summary of survey findings of knowledge of Antibiotics use (n=175).

Assessment of Attitude of Antibiotics

Generally, the attitude of most participants was positive towards antibiotics. The mean antibiotics attitude score was 4.93 (SD: 1.11, range: 0-6). A large number of participants either answered "No" (96%) with the statement " antibiotics be used to cure infection caused by viruses " while the lowest percentage (88%) mentioned that antibiotics are not safe drugs.

Table 3: Summary of survey findings of attitude towards antibiotics use (n=175).These are practices and not attitudes. There are a a lot of 'wrong' answers.

Question: Negative attitude items	Yes n(%)	No n(%)	I don't Know n(%)
When have a cold, I should take antibiotics to prevent getting a more serious illness	14(8)	152(87)	9(5)
When I get a fever, antibiotics help me to get better more quickly	21(12)	142(81)	9(5)
Skipping one or two doses does not contribute to the development of antibiotic resistance	15(9)	149(85)	9(5)
Have you shared antibiotics with member of your family?	18(10)	147(84)	10(6)
Antibiotics are safe drugs, hence they can be commonly used?	16(9)	138(79)	23(13)
I would rather take an antibiotic that may not be needed than wait to see if get better without it	7(4)	154(88)	14(8)

Assessment of Practice about Antibiotics

Overall, antibiotic practices among the healthcare students were reasonable. The mean antibiotics practice score was 4.55 (SD: 1.09, range: 0-5). For example, 87% (n=218) of the participants

indicated that they completed the full course of use of antibiotics. While 70% (n=176) of healthcare students they didn't take an antibiotic when they have cough and sore throat. In response to self-medication questions related to antibiotics, 65% (n=163)students said they didn't consulted doctors before starting an antibiotics, which was different to the study carried out in Italy which reported 81.38% medical students consulted doctors before taking antibiotics (Scaioli, 2015).

Question: Practice items	Yes n(%)	No n(%)	I don't Know n(%)
If you better, after taking 2 – 3 doses of antibiotics, do you still complete the full course of treatment?	152(87)	14(8)	9(5)
Do you prefer to take an antibiotic when you have cough and sore throat?	35(20)	122(70)	18(10)
Do you use antibiotics as a prophylaxis?	3(2)	11(6)	161(92)
Do you check the expiry date of the antibiotic before using it?	173(99)	2(1)	0(0)
Do you consult a doctor before starting an antibiotic?	44(25)	114(65)	17(10)

Table 4: Summary of survey findings of practices on antibiotics (n=175)

There was no significant association socio demographic with KAP on antibiotics (Table 1) except the education level. Most of pharmacy students have a good knowledge about antibiotic types. Also, most of them take into account the type of antibiotic 95% (n=166), the indications for using the antibiotic 94% (n=165) and the antibiotic side effects 91% (n=15) when they choose antibiotic for their self's (Table 5).

What did you take into account when you choose the antibiotic for yourself? You can choose more than one answer.	n(%)
The type of antibiotic	166(95)
The brand and country of manufacture of the antibiotic	2(1)
The price of the antibiotic	2(1)
The indications for using the antibiotic	165(94)
The antibiotic side effects	159(91)

Table 5: Summary of correct survey findings about antibiotic use

Discussion

To the best of our knowledge, this is the first KAP study about antibiotics use conducted among pharmacy of the occupied Palestinian territories. The antibiotics are the most frequently prescribed drugs nowadays, but often misused. Antibiotic resistance is increasing all over the world and presents a growing concern worldwide (Mohr, 2016). Most factors relating to patients incorrect antibiotic use include self-medication, sharing medication, not taking full course of treatment and keeping part of the course for next time. Poor infection control practices and increasing use of antibiotics in agriculture has also led to global concern for antibiotics resistance (Shah, 2020). Most pharmacy students had a high level of knowledge about antibiotics use (mean=8.85, SD=1.01).When we examined attitudes, participants showed a positive and optimistic attitude toward antibiotics (mean= 4.93, SD=1.11). Also, participants showed a good practice towards antibiotics use (mean= 4.55, SD=1.09). The study results confirmed statistically significant differences in the KAP of antibiotic.

Conclusions

This study revealed an important insight regarding the KAP regarding antibiotics use and its resistance among healthcare students. Overall, healthcare students had good knowledge, a positive attitude and a good practices towards antibiotics. Nevertheless, we suggest adding an antibiotics course within the education plan for human medicine, pharmacy and nursing if the students' KAP is

low, in addition to adequate training regarding the appropriate use of antibiotics to gain skill and experience on how to deal with the use and dispensing of antibiotics in the correct way, whether the KAP are good or not, as this target population will be the future leaders of the country.

Conflicts of Interest and Financial Disclosure

The authors declare no competing financial interest and no conflicts of interest concerning the authorship and/or publication of this article.

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