WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 12, Issue 17, 44-54. Research Article ISSN 2277– 7105

KNOWLEDGE AND PRACTICE REGARDING ANTIBIOTICS USE FOR UPPER RESPIRATORY TRACT INFECTIONS AMONG PRIMARY HEALTH CARE PHYSICIANS IN JAZAN REGION, SAUDI ARABIA

Ismail Somily[1]*, Fatimah Shajri[1], Abdulrahman Shajri[1], Hamzah Atiah[1], Awatif Mahbub[1], Ali Shaikh[1], Essa Alkubeshi[1], Aishah Mahbub[2], Khayrah Hazazi[1], Salihah Hazazi[1], Ibrahim Burayk[1], Fatimah Madkhali[1], Ibrahim Sumayli[1], Maram Darbashi[1], Aminah Alareash[1], Aishah Hendi[1], Enas Yahya[1] and Zahra Muqri[1],

[1]Jazan Health Affairs, Ministry of Health, Saudi Arabia.

[2]Faculty of Nursing, King Saud University, Saudi Arabia.

Article Received on
13 August 2023,

Revised on 03 Sept. 2023,
Accepted on 23 Sept. 2023

DOI: 10.20959/wjpr202317-29788

***Corresponding Author**
Dr. Ismail Somily
Jazan Health Affairs,
Ministry of Health, Saudi Arabia.

ABSTRACT

Background: Physicians' knowledge and practices regarding antibiotic prescription is fundamental for controlling the antibiotic use. **Objectives:** This study evaluates primary health care (PHC) physicians' knowledge and practices regarding antibiotics use in upper respiratory tract infections. **Methods:** After approval from Institute Ethical Committee and informed consent from the participant, the present study was conducted among PHC physicians. A self-administered questionnaire based on knowledge and practice regarding antibiotics use in upper respiratory tract infections was used to collect data. **Results:** our result revealed that 24.4% of PHC physicians had poor knowledge about antibiotics use in upper respiratory tract infections, additionally about half of them (48.8%) had poor practice towards antibiotics use for upper respiratory tract infections. The distribution of PHC physicians' knowledge and practices did not significantly vary according to age, gender, and years of experience. **Recommendation:** Therefore, We recommended a Continuous medical education supported with evidence based medicine skills will improve physicians antibiotics prescriptions and enhance the possibilities of good management outcomes among patients.

KEYWORD: Physician, Knowledge, Practices, Antibiotic, Prescription.

Word count: 206

1. INTRODUCTION

Upper respiratory tract infection (URTI) is the most common acute illness worldwide and is usually self-diagnosed and self-treated at home.[1,2] In 1995, URTI was the most frequent reason for seeking ambulatory care in the United States, resulting in more than 37 million visits to physician practitioners and emergency departments.[3] It is also the most common reason for absence from work in the United States. Losses in income for employed persons, costs to employers with time lost from work and costs of medical treatment amounted to USD 112 billion in 1997.[4]

The International Classification of Health Problems in Primary Care (ICHPPC)[5] defines an acute upper respiratory tract infection (URTI), the common cold, as an illness with evidence of acute inflammation of the nasal or pharyngeal mucosa and the absence of other specifically defined respiratory conditions, for example streptococcal tonsillitis, laryngitis, bronchitis, pneumonia, asthma and hay fever.[6]

Antibiotics are ineffective against infections that caused by viruses like the common cold, flu, most sore throats, bronchitis, and many sinus and ear infections. Widespread use of antibiotics for these illnesses is an example of how overuse of antibiotics can enhance the spread of antibiotic resistance. Genius use of antibiotics is key to controlling the spread of resistance.[7,8,9]

Overuse and misuse of antibiotics permits the event of antibiotic-resistant bacterium. On every occasion an individual takes antibiotics, sensitive bacterium (bacteria that antibiotics will still attack) is killed, however resistance bacterium is left to grow and multiply. This is how recurrent use of antibiotics can increase the amount of drug-resistance bacterium.[7,8,9]

Antibiotic resistance is one in all the foremost pressing threats to the public's health. Antibiotic resistant bacterium will cause diseases that were once simply treatable with antibiotics to become untreatable, resulting in dangerous infections. Antibiotic-resistance bacterium is usually harder to kill and expensive to treat. In some cases, the antibiotic-resistant infections will result in serious incapacity or maybe death.[7,8,9]

Physicians in PHC managing a majority of patients with URTI. Improving our understanding of the physicians' knowledge of antibiotics and their practices concerning antibiotic prescription is a key to manage the irrational antibiotic use. This study aimed to evaluate PHC physicians' knowledge and practice concerning antibiotic use in URTI.[10,11]

2. METHODS

2.1 Study design: This study was a cross-sectional study design.

2.2 Study area: Jazan Region stretches 300 km along the southern Red Sea coast, just north of Yemen. It covers an area of 11,671 km² and has a population of 1,365,110 at the 2010 census. The region has the highest population density in the Kingdom.

2.3 Study Setting and Target population: There are 443 primary health care physicians serving at 178 PHC centers in Jazan Region distributed within 14 governorates (Saudi Ministry of Health Statistical Yearbook, 2017).

2.4 Sample Size and Sampling technique

The minimum sample size for this study has been decided according to Taro Yamane Method, as follows:

n=N/[1+N(e)^2]

Where:

- n: Calculated sample size
- N: Population size.
- e: Sampling error (0.05)
- ^: Raised to power

The calculated minimum sample size was:

n=418/[1+418(0.05)^2] =204.40

To fulfill the required sample size, the researcher included 250 primary care physicians assuming that the non-response rate is 20% as previous studies found. All health care providers within selected PHC center and satisfied the inclusion criteria was enrolled in the study. A simple random sample was used to select 40 primary health care (PHC) centers within Jazan Region. All physicians within selected PHC center were invited to participate in the current study. Filled questionnaire sheets were collected on the same day.

2.5 Data collection tool: The self-administered validated questionnaire of Al-Homaidan (10) was used for data collection after modification, because the original questionnaire has questions regarding attitudes which is not included in the study objectives. The study questionnaire consists of 25 questions and is composed of four parts as follows:

1- Characteristics of participants (5 questions): Age, gender, nationality, professional status, experience in medical practice.
2- Knowledge (11 questions): Covers questions about primary care physicians' knowledge related to antibiotics.
3- Practice (9 questions): Covers questions about primary care physicians' practice regarding antibiotic use for upper respiratory tract infections.

Regarding the questions of knowledge, the correct answer for each question was scored by 5 marks, while the wrong answer was scored by 0 marks, so the total score of all knowledge's questions ranged between zero and 55 marks. The participants' degree of knowledge was classified according to their total marks as poor [rang 0-18 marks], fair[19-37] and good.[38-55]

However, the questions of practice, the correct answer for each question was scored by 5 marks, while the wrong answer was scored by 0 marks, so the total score of all practice's questions ranged between zero and 45 marks. The participants' degree of practice was classified according to their total marks as poor [rang 0-15 marks], fair[16-30] and good.[31-45]

2.6 Scoring System and Statistical analysis: SPSS (version 22) was used for data entry and statistical analysis. The quantitative data was reported as a mean and standard deviation, and the qualitative ones was reported as frequency and percentage. Regarding tests for significance, t-test, ANOVA (For parametric normally distributed variables, Chi Square (for categorical variable). P value less than 0.5 was considered as an indication of significance.

2.7 Ethical consideration: Approval was obtained in November 2019 from Jazan Hospital Institutional Review Board. Before start of the study, the researcher fulfilled all the necessary official approvals by the pertinent ethical committee. Potential participants were clearly and briefly informed about the objectives of this study. A covering page has been added to inform primary care physicians about the study and ask them to agree to participate. Participants were assured regarding the full confidentiality of any collected data.

3. RESULT

Table 1: General characteristics of the respondents.		
General characteristics (n = 250)	**No**	**%**
Age (years):		
25-	62	24.8
30 - 40	66	26.4
> 40	122	48.8
Gender:		
Male	186	74.4
Female	64	25.6
Nationality		
Saudi	78	31.2
Non-Saudi	172	68.8
Educational qualification:		
MBBS	158	63.2
Diploma	16	6.4
Master	20	8.0
Board of family medicine	56	22.4
Years of experience:		
< 1	16	6.4
1-5	64	25.6
> 5	170	68.0

As shown in Table 1, 48.8% of the participants belongs to the age group > 40 years old, males (74.4%) predominate females (25.6%), 68.8% are non-Saudi, 63.2% of the participants have MBBS. Furthermore, 68.0% of the sample have experience more than five years.

Table 2: Knowledge's levels of the studied participants.			
knowledge's levels	**No**	**%**	**Confidence Interval at 95%**
Poor	61	24.4	0.19– 0.30
Fair	53	21.2	0.16 – 0.27
Good	136	54.4	0.48– 0.60
Total	250	100.00	

Table 2 shows that, 54.4% of the studied sample have good knowledge regarding the antibiotics use for upper respiratory tract infections, while only 24.4% have poor knowledge.

Table 3: Practice of the studied participants.			
Level of Practice	**No**	**%**	**Confidence Interval at 95%**
Practice:			
poor	122	48.8	0.43 – 0.55
Fair	40	16.0	0.12 – 0.21
Good	88	35.2	0.30 – 0.41
Total	250	100.00	

As shown in table 3, 48.8% of the participants have poor practice regarding the antibiotics use for upper respiratory tract infections. Moreover, 35.2% have good practice.

Table 4: Distribution of participants' level of knowledge according to their general characteristics.

Characteristics	Level of knowledge						P value
	Poor N= 61		Fair N= 53		Good N= 136		
	N	%	N	%	N	%	
Age (years):							
25-	20	32.3	13	21.0	29	46.7	> 0.05
30 - 40	14	21.2	17	25.8	35	53.0	
> 40	27	22.1	23	18.9	72	59.0	
Gender:							
Male	44	23.7	35	18.8	107	57.5	> 0.05
Female	17	26.6	18	28.1	29	45.3	
Educational qualification:							
MBBS	43	27.2	41	25.9	74	46.9	**< 0.05**
Diploma	6	37.5	1	6.2	9	56.3	
Master	4	20.0	5	25.0	11	55.0	
Board of family medicine	8	14.3	6	10.7	42	75.0	
Nationality:							
Saudi	23	29.5	17	21.8	38	48.7	> 0.05
Non-Saudi	38	22.1	36	20.9	98	57.0	
Years of experience:							
< 1	7	43.8	6	37.5	3	18.7	
1-5	17	26.6	13	20.3	34	53.1	> 0.05
> 5	37	21.8	34	20.0	99	58.2	

It is shown in table (4) that 59.0% of the participants who belong to the age group (> 40 years) have good knowledge and 57.5% of males have also good knowledge but, the difference in the distribution of age groups and gender regarding the level of knowledge is statistically insignificant ($p > 0.05$). The table also shows that, 55% and 75% of participants who had Master degree and Board of family medicine respectively have good knowledge and the difference in distribution of educational qualification regarding level of knowledge is statistically significant ($P < 0.05$).

Table 5: Distribution of the level of practice regarding the general characteristics of the participants.

Characteristics	Practice						P value
	Poor N= 122		Fair N= 40		Good N= 88		
	N	%	N	%	N	%	
Age (years):							
25-	37	59.7	6	9.7	19	30.6	
30 - 40	32	48.5	13	19.7	21	31.8	> 0.05
> 40	53	43.4	21	17.2	48	39.4	
Gender:							
Male	85	45.7	33	17.7	68	36.6	> 0.05
Female	37	57.8	7	10.9	20	31.3	
Educational qualification:							
MBBS	91	57.6	34	21.5	33	20.9	
Diploma	9	56.2	0	0.0	7	43.8	**< 0.05**
Master	6	30.0	3	15.0	11	55.0	
Board of family medicine	16	28.6	3	5.4	37	66.0	
Nationality:							
Saudi	47	60.3	7	9.0	24	30.7	**< 0.05**
Non-Saudi	75	43.6	33	19.2	64	37.2	
Years of experience:							
< 1	11	68.8	3	18.8	2	12.4	
1-5	35	54.7	7	10.9	22	34.4	> 0.05
> 5	76	44.7	30	17.6	64	37.7	

It is shown in table (5) that 39.4% of the participants who belong to the age group (> 40 years) have good practice and 36.6% of males have also good practice but, the difference in the distribution of age groups and gender regarding the level of practice is statistically insignificant ($p > 0.05$). The table also shows that, 55% and 66% of participants who had Master degree and Board of family medicine respectively have good practice and the difference in distribution of educational qualification regarding level of practice is statistically significant ($P < 0.05$).

4. DISCUSSION

The This study was conducted to evaluate knowledge and practice of primary health care physicians in Jazan region in Saudi Arabia regarding antibiotics and their use for upper respiratory tract infections.

Understanding the great importance of proper use of antibiotics, particularly in PHCCs, this work was done to examine this issue in detail from the perspectives of PHC physicians who

are responsible for prescription and education of patients regarding antibiotics. Filling the gap in researches regarding this issue can offer proper research-derived recommendations.[10]

The main finding of the study was that primary health care physicians have a poor level of knowledge regarding antibiotics and their use for upper respiratory tract infections (Table 2). Our findings are similar to previous studies that show lack of knowledge in the prescription of antibiotics.[10,12] That finding also agrees with a study conducted in Ecuador.[13]

However the present study revealed that, level of knowledge is relatively better than of practice, this agree with the findings of other study conducted in Makkah.[14]

Regarding the level of practice, the present study findings determined that approximately one third of the studied primary care physicians had good level of practice related to antibiotics use (Table 3), and that coincides with the findings of another study conducted in Al-Qassim.[10]

Although the similarity in pattern of distribution of levels of knowledge and practice among the participants, the findings revealed higher knowledge's level than of practice and that could be explained by the fact that knowledge usually precedes practice.[15]

Concerning the knowledge assessment items, it was found in the present study that, the wrong answers was higher among the participants and arranged from highest to lowest in the following order: a) measures should be followed to decrease the antibiotic bacterial resistance, b) measures to minimize antibiotics side effects, c) causes increase the antibiotic bacterial resistance, d) measures that should be followed during treatment with antibiotics to shorten the duration of illness and e) measures for declining morbidity and mortality of infectious diseases. These findings are similar to what is reported in other studies.[10,14]

Regarding the factors affecting the level of knowledge, the findings of the present study revealed that, the difference in distribution of the knowledge's levels according to age, gender, nationality and years of experience is statistically insignificant ($P > 0.05$). However, the difference in distribution of knowledge is statistically significant ($P < 0.05$) with the educational qualification, as the total score of knowledge increases with the higher qualification (master and board of family medicine) and vice versa (Table 4), these findings coincide with those of other studies which reported that factors such as gender, nationality, age, and years since graduation do not seem to affect physicians' knowledge and expectation

since they all receive extensive and frequent orientation and training on PHC principles and practices.[10,13,14]

Furthermore, the findings of our study revealed that distribution of the level of practice among the studied physicians is statistically insignificant ($P > 0.05$) with age, gender and years of experience, while it is significant ($P < 0.05$) with nationality and educational qualification (Table 5), these findings are in agreement with those of other studies which reported that skills and practice improve with higher educational qualification.[10,13]

5. CONCLUSION

This study revealed a critical issue that a considerable number of PHC physicians in Jazan had inadequate knowledge of antibiotics use for upper respiratory tract infections, as a fourth of the studied sample had poor knowledge and less than half of them had poor practice. Regarding the association between certain factors and the level of knowledge; there is a significant association with the educational qualification, while the association isn't significant with the age, gender, nationality, and years of experience.

Concerning the associations between the level of practice and other variables; the association is not significant with age, gender and years of experience while, it is significant with the educational qualification and nationality.

6. ACKNOWLEDGEMENT

We would like to express our sincere thanks and deepest gratitude to my supervisor for his great support during the whole research work. We would like to express our sincere thanks to the physicians who participated in this study.

REFERENCES

1. McAvoy B, Davis P, Raymont A, Gribben B. The Waikato Medical Care Survey. *New Zealand Medical Journal*, 1994; 107: 387-433.
2. Cherry DK, Burt CW, Woodwell DA. National Ambulatory Medical Care Survey: 2001 summary. Advance Data. http://www.cdc.gov/nchs/data/ad/ad338. pdf (accessed 24 September 2003), 2003; 337: 1-44.
3. Gonzales R, Bartlett JG, Besser RE, Hickner JM, Hoffman JR, Sande MA, et al. Principles of appropriate antibiotic use for treatment of nonspecific upper respiratory

tract infections in adults: background. *Annals of Emergency Medicine*, 2001; 37(6): 698-702.

4. Birnbaum HG, Morley M, Greenberg PE, Colice GL. Economic burden of respiratory infections in an employed population. *Chest*, 2002; 122(2): 603-11.
5. Spector SL. The common cold: current therapy and natural history. *Journal of Allergy and Clinical Immunology*, 1995; 95: 1133-8.
6. ICHPPC-2. *International Classification of Health Problems in Primary Care*. Third Edition. Oxford: Oxford University Press, 1986.
7. Antibiotic Resistance Questions and Answers | Community | Antibiotic Use | CDC. (n.d.). Retrieved from http://www.cdc.gov/antibiotic-use/community/about/antibiotic-resistance-faqs.html (A)
8. Antibiotic Resistance Questions and Answers | Community | Antibiotic Use | CDC. (n.d.). Retrieved from http://www.cdc.gov/antibiotic-use/community/about/antibiotic-resistance-faqs.html (B)
9. Antibiotic Resistance Questions and Answers | Community | Antibiotic Use | CDC. (n.d.). Retrieved from http://www.cdc.gov/antibiotic-use/community/about/antibiotic-resistance-faqs.html (C)
10. Al-Homaidan, H. T., & Barrimah, I. E. Physicians' knowledge, expectations, and practice regarding antibiotic use in primary health care, 2018. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/29896067
11. Mohamed Azmi Hassali, Tengku Karmila Tengku Kamil, Faridah Aryani Md Yusof, Alian A Alrasheedy, Zuraidah Mohd Yusoff, Fahad Saleem, Saleh Karamah AL-Tamimi, Zhi Yen Wong, Hisham Aljadhey & Brian Godman General practitioners' knowledge, attitude and prescribing of antibiotics for upper respiratory tract infections in Selangor, Malaysia: findings and implications, Expert Review of Anti-infective Therapy, 2015; 13, 4: 511-520, DOI: 10.1586/14787210.2015.1012497
12. Liu C, Liu C, Wang D, Zhang X. Intrinsic and external determinants of antibiotic prescribing: a multi-level path analysis of primary care prescriptions in Hubei, China. Antimicrobial Resistance & Infection Control, 2019; 8(1): 1-12.
13. Sánchez X, Landázuri A, Londo P, Manzano A, Moreno Roca A, Jimbo R. Knowledge, Attitudes and Practices in Antibiotic Use in Family Medicine Students. Journal of Primary Care & Community Health, 2020; 11: 2150132720984758.
14. Najwa, A. L., and Osama Al-Wafi. "Journal Homepage:-www. journalijar. com."

15. Steup M. Epistemology: Stanford encyclopedia of philosophy. Stanford University. Center for the Study of Language and Information (US), 2005.