

Public Perception of Pharmacist's Role during COVID-19 Outbreak in Jordan

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ABSTRACT

Background: The pandemic COVID-19 requires collaborative teamwork by all healthcare professionals including Pharmacists who could help in combating epidemic diseases by providing several pharmaceutical services. Nevertheless, public perception of pharmacist's role in providing health service is controversial

Methods: A cross-sectional web-based design validated survey of 25 items was used to explore patients' opinion about pharmacist's ability to provide different health services during COVID-19 pandemic. Exploratory factor analysis (EFA) was conducted to evaluate the best model for the questionnaire. The association between different demographic variables and awareness about pharmacist's role was evaluated using Pearson correlation, Mann-Whitney u test and Kruskal–Wallis one-way analysis of variance.

Results: A total of 668 persons participated in the study. The mean (SD) of the respondent questionnaire scores was 97.1 (12.6) and the possible maximum score was 115 (12.9). Higher awareness score was associated with increased age, female gender, lower educational level, living out of Amman the capital, being college or university student or being employed in medical field.

Conclusion: The positive public perception toward pharmacist role shown in the present study enlighten the need to expand pharmacist role to be more engaged in providing different health services during the disaster or normal conditions.

Keywords: COVID-19, Public, Perception, Pharmacist, Awareness, Health service, Jordan.

INTRODUCTION

Coronavirus disease (COVID-19) is a new breakthrough viral respiratory disease that is characterized by symptoms similar to that of the common cold including fever, fatigue, dry cough and shortness of breath¹. However, the degree of these symptoms varies from one patient to another, ranging from mild to severe acute

respiratory distress syndrome, and in some cases it can cause death^{2,3}. The origin of COVID-19 comes from bats that have mutated with this virus and was then transmitted to the humans⁴. This virus is very contagious and can be transmitted between people in an uncontrollable way through respiratory droplets and secretion, and by contaminated inanimate surfaces of plastic, glass or metal. The disease could be symptomatic or asymptomatic^{5,6}. It affects children, adults and elderly people but it is more prominent in the elderly people, especially those with chronic diseases such as diabetes and hypertension⁷.

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In February 2020, the World Health Organization (WHO) termed this disease COVID-19, which is discovered in 2019 and the first case was identified in China.^{2,3,8} On March 11th 2020, COVID-19 was announced a global pandemic disease and most countries around the world have registered COVID-19 cases within short period of time⁹. The epidemic COVID-19 requires collaborative teamwork by all healthcare professionals including pharmacists, who can play a fundamental and unique role to improve patient care, especially during this COVID-19 pandemic^{10,11}.

On March 19, 2020, the International Federation of Pharmacy (FIP) guideline reported several recommendations for dealing with a COVID-19 outbreak, including interventions and patient counseling that pharmacists should provide during this serious situation¹². Pharmacists could help in epidemic diseases such as COVID-19 by providing a lot of services such as guaranteeing the availability and timely provision of the safest and most effective therapy, in which they must plan for, identify, and mitigate drug shortages, especially during this pandemic¹³. Pharmacists could educate patients and the public community about the effective strategies required to prevent further spread of the infection such as optimal hand hygiene, social distancing, staying home if having respiratory symptoms and symptoms relief¹³. Nevertheless, public perception of pharmacist's role in providing health service in pandemic or other health problem is controversial. While some studies reported public awareness of the pharmacist role^{14,15,16}, other studies failed to report similar finding^{17,18,19}.

Aim of the study

The aim of this study therefore was to explore public perception of pharmacist role during COVID 19 outbreak. The present study is the first one in Jordan to evaluate public perception of pharmacist role during the COVID 19 outbreak. Findings of the present study will help to investigate how do the community members understand and perceive the pharmacists' role during COVID 19

outbreak, providing a guide on how to reinforce and improve this role during any future crisis.

Methods

Study design and participants

A cross-sectional web-based design survey was distributed anonymously online using social media, with the Facebook as platform of the study on 12 April 2020. Adults older than 18 years and living in Jordan were asked to participate in the study with emphasis on the right to withdraw at any time. The initial questionnaire was developed in English and translated into Arabic, the official language in Jordan, using forward-backwards translation, then face validity was evaluated. The content validity of the questionnaire was evaluated by a panel of experts in clinical pharmacy practice and pharmacoepidemiology. In order to improve the reliability and clarity of the survey, the questionnaire was formatted into Google form and piloted among twenty purposely selected society members who were excluded from the main study.

Study instrument

In addition to the socio-demographics, the questionnaire was composed of 25 items describing pharmacist role in implementing different services during the COVID-19 pandemic such as providing sufficient information about causes, symptoms, prevention and management of COVID-19, being able to discover and develop the necessary treatment for COVID-19, being reliable and accessible resource for providing pharmaceutical advice about the most appropriate therapeutic regimen during a public health emergency such as the pandemic covid-19, reviewing and interpreting information and studies related to the Corona epidemic for other healthcare team members and being responsible for ensuring the availability of safest and most effective treatment¹³. The study participants were asked about their opinion on pharmacist's ability to perform each service on a 5-likert scale ranging from strongly disagree to strongly agree.

Ethical approval

The study received ethical approval from the Scientific

Research and Ethics Committee at Jordan University of Science and Technology.

Statistical analysis

The SPSS statistical package version 25 was used to analyze the data. Continuous data was expressed as mean and SD, while categorical variables were expressed as frequencies and percentages. Kaiser-Meyer-Olkin value (KMO), and Bartlett’s Test of Sphericity were performed to evaluate the suitability of the data for factor analysis. Exploratory factor analysis (EFA) was conducted using principal-components analysis to evaluate the most suitable model for the study data. Scree plot was produced to evaluate the suitable number of factors to be included in the model. Communalities were produced and only items above 0.35 were retained. Cronbach’s alpha for each factor, Corrected item-total correlation, and Cronbach’s alpha if item deleted were calculated to evaluate the internal consistency of the questionnaire. The ceiling and flooring effect was evaluated by calculating the percentage of participant who had the maximal or minimal possible

scores, the accepted range to exclude these effect is below 15%^[20]. Pearson correlation, Mann-Whitney u test and Kruskal–Wallis one-way analysis of variance were used to examine the correlation between different confounding factors and the respondents’ scores in the questionnaire.

Results

As shown in Table 1, a total of 668 participants completed the study questionnaire. The mean age of the sample was 30.18 (10.679) and most of them were female (67.8%), had education level of bachelor’s degree (74.4%), lived outside Amman (73.3%), were insured (79.2%), had income below 800 JD (64.2%) and were college or university students (32.5%). The participants’ mean number of children was 1.33 (±2.51). Social media was the most recognized method (37.9%) to spread awareness about COVID-19 by pharmacist KMO and Bartlett’s Test of Sphericity were 0.956 & χ^2 (406) = 21975.94, P < 0.01, indicating the suitability of data for exploratory factor analysis (EFA). Scree plots indicated that a one factor model is the most suitable model for the study data (Figure 1).

Table1: Demographic characteristics of the study participants (n=668)

Variables	Number of participants (%)
Age (mean, SD)	30.18 (10.68)
Number of Children (mean, SD)	1.33 (2.51)
Gender	
Male	215 (32.2%)
Female	435 (67.8%)
Education Level	
High school	33 (4.9%)
Bachelor’s degree	497 (74.4%)
Higher education (Master or PhD)	138 (20.7%)
Social Status	
Married	302 (45.2%)
Not married	366 (54.8%)
Current Job	
Unemployed	131 (19.6%)
Medical sector (doctor, nurse, dentist, pharmacist, medical laboratory)	119 (17.8%)
Outside the medical sector (government employee, private sector, self-employment)	182 (27.2%)
College or university student	217 (32.5%)
Retired	19 (2.8%)

Variables	Number of participants (%)
Income level	
Less than 800 dinars per month	429 (64.2%)
800-1600 dinars per month	161 (24.1%)
1601-2400 dinars per month	47 (7%)
More than 2,400 dinars per month	31 (4.6%)
Place of Living	
Inside Amman	176 (26.3%)
Outside Amman	492 (73.7%)
Health Insurance	
Yes	529 (79.2%)
No	139 (20.8%)
Best way for a pharmacist to spread awareness	
Social media	253 (37.9%)
Make educational leaflet	24 (3.6%)
Explanatory videos	106 (15.9%)
TV screen channels	31 (4.6%)
Directly to customers in the pharmacy	254 (38%)

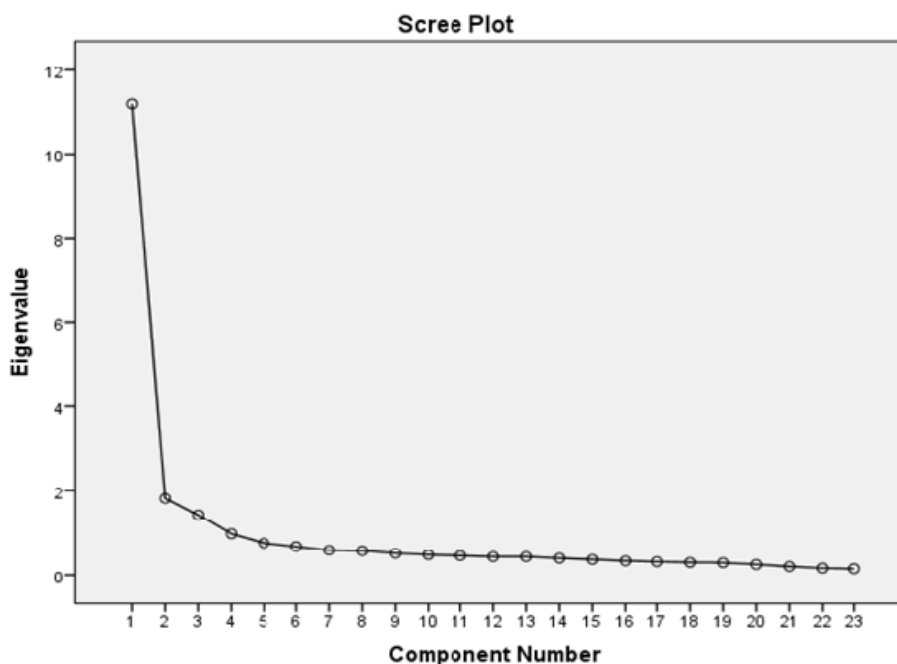


Figure 1: Scree plot for factor analysis

Items 24 (The home delivery service of the drug was very useful during the Corona crisis), and 25 (Home visits by pharmacists are needed to give advice about treatments) were removed due to low communalities (>0.35). EFA was re-run

after excluding items 24 and 25. The best model for the study data was a one factor model composed of 23 items as shown in Table 2.

Table 2: Questionnaire scores for each group and the significance

Variables	Total Score (mean, SD)	P value *
Age (mean, SD)		< 0.01
Number of Children (mean, SD)		N/S
Gender		0.01
Male	94.58 (15.31)	
Female	98.30 (10.91)	
Education Level		< 0.01
High school	98.42 (9.58)	
Bachelor's degree	98.42 (11.29)	
Higher education (Master or PhD)	92.04 (16.06)	
Social Status		< 0.01
Married	94.93 (12.85)	
Not married	98.89 (12.13)	
Current Job		< 0.01
Unemployed	94.87 (10.27)	
Medical sector (doctor, nurse, dentist, pharmacist, medical laboratory)	99.18 (11.55)	
Outside the medical sector (government employee, private sector, self-employment)	92.63 (15.12)	
College or university student	101.04 (10.57)	
Retired	97.37 (12.61)	
Income level:		N/S
Less than 800 dinars per month	98.00 (11.02)	
800-1600 dinars per month	95.69 (14.94)	
1601-2400 dinars per month	96.89 (13.67)	
More than 2,400 dinars per month	92.35 (16.65)	
Place of Living		< 0.01
Inside Amman	94.06 (15.53)	
Outside Amman	98.19 (11.20)	
Health Insurance		N/S
Yes	96.74 (12.62)	
No	98.49 (12.49)	
Best way for a pharmacist to spread awareness		N/S
Social media	93.21 (13.84)	
Make educational leaflet	98.37 (10.77)	
Explanatory videos	98.39 (16.37)	
TV screen channels	96.48 (13.78)	
Directly to customers in the pharmacy	97.42 (11.37)	

*P value measure association between total awareness score and sociodemographic characteristics.

Item 16 had the lowest communality (0.38) and the lowest loading (0.62). While the highest communality and factor loadings were for item7 (0.61 and 0.78

respectively). The highest two means were item 17 (4.60) and item (4.41), while item 3 (3.97) and item 5 (4.00) had the lowest means. Also, item 3 had the highest variability

between participants (SD=1.00), while item 23 had the lowest variation (SD = 0.66). The factor's Cronbach's alpha was 0.95 and deleting any items would not increase the internal consistency of the model. The percentages of the participants who scored the highest or lowest possible scores were less than the threshold point of 15%.

The mean (SD) of the total respondent questionnaire scores was 97.1 (12.6) and the highest score was 115 (12.9). Results of Pearson correlation, Mann-Whitney U test or Kruskal-Wallis one-way analysis of variance

showed that age, gender, education level, social status, current job, and place of living were significantly associated with the questionnaire scores (Table 3). For example, females had significantly higher scores when compared with males (P=0,01). Higher education group had significantly less score when compared with other education groups (P<0.01), higher scores were also reported by university students and participants living in Amman (P< 0.01).

Table 3: Item loadings, corrected total correlation and Cronbach's Alpha If Item Deleted

Questions	Factor Loadings	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted	communalities	mean (SD)
Q1: Pharmacists have a key role in limiting the spread of the Corona epidemic.	0.67	0.64	0.95	0.45	4.12 (0.87)
Q2: The pharmacist has an important role in alleviating the negative consequences caused by Corona's disease.	0.73	0.71	0.95	0.53	4.10 (0.81)
Q3: The pharmacist's role in addressing the epidemic and corona treatment and to mitigate the negative consequences no less important than the role of members of the medical team, such as doctor and nurse	0.65	0.62	0.95	0.42	3.97 (1.00)
Q4: The pharmacist has sufficient capacity to provide complete and sufficient information about the Corona epidemic.	0.71	0.68	0.95	0.51	4.10 (0.88)
Q5: Pharmacists have a primary role in reviewing and interpreting information and studies related to the Corona epidemic of fellow doctors and nurses.	0.69	0.66	0.95	0.48	4.00 (0.85)
Q6: Pharmacists are a reliable resource that all people can access during a public health emergency, such as the Corona epidemic	0.72	0.69	0.95	0.52	4.01 (0.91)
Q7: The pharmacist has an important role in educating their patients and the public about effective efficacy to prevent infection acquisition and spread (such as ideal hand hygiene and avoiding contact and staying at home if respiratory symptoms appear).	0.78	0.75	0.95	0.61	4.36 (0.74)
Q8: The pharmacist has an important role in providing people (whether or not he is infected) with drug information related to drugs used to treat the Corona epidemic, and the side effects of their use.	0.76	0.72	0.95	0.57	4.32 (0.76)

Questions	Factor Loadings	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted	communalities	mean (SD)
Q9: Pharmacists have an important role in ensuring that the safest and most effective treatment is available and available in a timely manner, in addition to ensuring access to these treatments and other medicines that may be deficient due to the epidemic.	0.77	0.74	0.95	0.59	4.24 (0.78)
Q10: Pharmacists must act proactively and determine the effectiveness of treatment alternatives.	0.65	0.61	0.95	0.42	4.16 (0.80)
Q11: The pharmacist has a primary role in discovering and developing the necessary treatment for the Corona epidemic.	0.66	0.63	0.95	0.44	4.04 (0.92)
Q12: The pharmacist has an important role in providing the following information about the Corona epidemic: What is an epidemic?	0.68	0.65	0.95	0.47	4.19 (0.79)
Q13: The pharmacist has an important role in providing the following information about the Corona epidemic: Methods of transmission of the epidemic	0.68	0.64	0.95	0.46	4.34 (0.74)
Q14: The pharmacist has an important role in providing the following information about the Corona epidemic: Symptoms of the epidemic	0.67	0.63	0.95	0.45	4.34 (0.75)
Q15: The pharmacist has an important role in providing the following information about the Corona epidemic: Epidemic prevention methods	0.68	0.64	0.95	0.46	4.41 (0.71)
Q16: The pharmacist has an important role in providing pharmaceutical services remotely to prevent the spread of the Corona epidemic, (such as delivering the medications that the patient needs to the home, helping people to take the appropriate medications and determining the doses needed for the medications by communicating with the pharmacist by phone or social networking sites).	0.62	0.57	0.95	0.38	4.37 (0.71)
Q17: The pharmacist has an important role in providing the following information about the Corona epidemic: Causes of Corona epidemic	0.65	0.61	0.95	0.42	4.60 (0.93)
Q18: The pharmacist is able to provide the correct and necessary pharmaceutical advice and indicate reliable sources to obtain the correct information related to the Corona epidemic.	0.75	0.72	0.95	0.57	4.30 (0.73)

Questions	Factor Loadings	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted	communalities	mean (SD)
Q19: The pharmacist has an important role in helping doctors and nurses choose the appropriate pharmaceutical form of the medications so that they help limit unnecessary entry into the patient's room.	0.72	0.68	0.95	0.52	4.25 (0.77)
Q20: A pharmacist is an expert in drug information and evaluation of studies related to new treatments or the use of drugs available in the treatment of the Corona epidemic and determining the correct doses for these drugs.	0.74	0.71	0.95	0.55	4.23 (0.80)
Q21: One of the main tasks of pharmacists is to plan the deficiency of drugs, identify them and reduce them during the spread of the epidemic, because the shortage of medicines can lead to prescribing suboptimal treatment and therefore may cause harm to the patient.	0.66	0.62	0.95	0.44	4.30 (0.71)
Q22: Pharmacists working in community pharmacies can help in detecting cases infected with the epidemic by reporting cases with symptoms similar to the symptoms of the epidemic, or telling the patient that an examination is necessary to make sure there is no infection.	0.68	0.65	0.95	0.47	4.26 (0.75)
Q23: The pharmacist has a major role in providing people with their medical needs during the Corona crisis	0.69	0.65	0.95	0.48	4.31 (0.66)

Discussion

Coronavirus disease (COVID-19) is a new widely contagious disease ^{5,6}, that claimed the lives of hundreds of thousands around the world ⁹, and lead to great economic losses²¹. This great impact of COVID-19 on the global health and economy requires a collaborative teamwork by all healthcare professionals including pharmacists who could help in combating epidemic diseases by providing several pharmaceutical services ¹⁰. Nevertheless, several studies indicated a lack of awareness of the role of pharmacists in public health activities ^{19,22}. Therefore, there is a need to assess the perception of the public on the role pharmacists may play during a pandemic such as COVID-19. The present study is the first one in

Jordan to evaluate public perception of pharmacists' role during the COVID-19 outbreak and demonstrated the importance of this role.

This study validated a tool to measure the public awareness regarding the role of pharmacists during a pandemic such as COVID-19, the results of the factor analysis indicated that all the questions included in the final version after excluding items 24 (The home delivery service of the drug was very useful during the Corona crisis), and 25 (Home visits by pharmacists are needed to give advice about treatments) were highly correlated and loaded in single factor, in addition the Cronbach's alpha result indicated high internal consistency and reliability of the questionnaire.

Although the responses to items that evaluated the perception of the public regarding the general role of pharmacist were consistent, when asking about specific services including home delivery and house visits the responses of the participants varied which may be related to different variables including respondent location

As reported previously, the practice of pharmacy has expanded from merely medicine dispensing to providing a wide variety of health-related services^{23,24,25}. Community pharmacists are the most accessible healthcare professionals^{26,27} and have an essential role in connecting physicians with patients^{28,29}. The curfew declared in Jordan to limit the spread of COVID-19 limited the ability of the public to reach a pharmacy, which raised a need to provide pharmaceutical services remotely including delivering necessary medicines, particularly for chronic conditions, and provide patient consulting services through a variety of techniques including phone calls, mobile applications and the internet to reduce patients' unnecessary visits to the pharmacy. The remote pharmaceutical services have also been applied in many countries including China²³, which launched the "Online Pharmaceutical Monitoring" service, which is an online pharmaceutical service model that uses WeChat Application with smart mobile during COVID-19 pandemic³⁰. In agreement with a previous study findings^{23,30}, the results of this study indicated that the general public understands the importance of the remote services provided by pharmacist during the COVID-19 pandemic and looks favorably in the important role pharmacist play in providing necessary medication and other necessary COVID-19 preventive products including masks and sanitizers, in addition to providing reliable patient counseling services.

Furthermore, the results of this study show that the general public perceived pharmacists as a reliable source of information about COVID-19 identity, disease symptoms, methods of transmission and management of the disease. The present study also showed that the general

public believed in pharmacists' role in improving patients and public awareness about the effective methods to prevent the spread of COVID-19 such as ideal hand hygiene, mask handling and social distancing³⁰; which could help in reducing the spread of COVID-19³¹.

The results of this study showed that the general public appraised the necessary role of pharmacists in the interpretation of the latest COVID-19 related studies and in the management of COVID-19. This role was reported in previous studies that highlighted the important pharmacist role in evaluating the different treatment strategies^{30,32}. The pharmacist could also play an active role in reducing vaccine hesitancy reported in previous studies^{33,34} and correct different misconception about COVID-19³⁵

The present study shows that females had significantly higher perception scores about pharmacists' when compared with males ($P=0.01$). Awad et al. reported that females chose the pharmacist as the first person to contact in minor disease significantly more than males ($P= 0.008$)¹⁷. Awad et al. also found that participants aged ≥ 40 years had a more positive view regarding the pharmacists' role in public health when compared with younger participants¹⁷, which is in agreement with the present study findings.

Earlier research studies reported significant association between education level and the perception toward different pharmaceutical services provided by the pharmacists^{36,37}. The majority of the present study participants had at least a bachelor's degree (95.1%), which could justify the positive views found towards the pharmacist's role in this study.

In agreement with earlier studies which showed that customers from rural areas had a longer conversations with the pharmacists and discussed wider range of health-related topics^{38,39,40,41}, people who live outside Amman tended to appreciate the pharmacist's role more than those who live inside Amman. This may be attributed to the socio- economic status of the customers, the volume of

business the pharmacy has and having more independent pharmacies rather than chain pharmacies ⁴².

Study limitations

The main limitation of this study was that only those who were literate and had a connection to the internet were able to participate in the study. Also, a bias may result from the possibility that the participants in this study were more aware or interested in pharmacists' role than those who did show interest to complete the questionnaire. Lastly, the study respondents were mainly young people. However, the Jordanian society is characterized by a youthful status with only 4% are 65 years and above.

Conclusion

In conclusion, this study validated a tool to evaluate Jordan public's perception on the role and satisfaction on the services provided by the pharmacists during COVID-19 epidemic. Public had a positive perception regarding the roles and responsibilities of the pharmacists during COVID-19 epidemic, and were satisfied with different

pharmaceutical services provided by the pharmacists including remote patients' education and spreading awareness about COVID-19. The current study demonstrates how do the community members understand and perceive the pharmacists' role during COVID 19 outbreak, providing a guide on how to reinforce and improve this role during any future crisis

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Conflict of interest

None to declare

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تصور الجمهور لدور الصيدلاني خلال تفشي مرض كوفيد-19 في الأردن

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ملخص

الخلفية: تتطلب جائحة كوفيد-19 عملاً جماعياً تعاونياً من قبل جميع المتخصصين في الرعاية الصحية بما في ذلك الصيادلة الذين يمكنهم المساعدة في مكافحة الأمراض الوبائية من خلال تقديم العديد من الخدمات الصيدلانية. ومع ذلك، فإن التصور العام لدور الصيدلي في تقديم الخدمة الصحية مثير للجدل .

الطرق: تم استخدام مسح مستعرض موثوق على شبكة الإنترنت مكون من 25 عنصرًا لاستكشاف رأي المرضى حول قدرة الصيدلي على تقديم خدمات صحية مختلفة أثناء جائحة كوفيد-19. تم إجراء تحليل عامل الاستكشاف لتقييم أفضل نموذج للاستبيان. تم تقييم الارتباط بين المتغيرات الديموغرافية المختلفة والوعي حول دور الصيدلي باستخدام ارتباط بيرسون واختبار مان-ويتني وتحليل التباين أحادي الاتجاه كروسكال واليس.

النتائج: شارك في الدراسة 668 شخصاً. كان متوسط درجات استبيان المستجيبين 97.1 (12.6) وكانت الدرجة القصوى الممكنة 115 (12.9). ارتبط ارتفاع درجة الوعي بزيادة العمر، وجنس الإناث، وانخفاض المستوى التعليمي، والعيش خارج العاصمة عمان، أو كونك طالباً جامعياً أو جامعياً أو يعمل في المجال الطبي.

الخلاصة: إن التصور العام الإيجابي تجاه دور الصيدلي الموضح في الدراسة الحالية ينير الحاجة إلى توسيع دور الصيدلي ليكون أكثر انخراطاً في تقديم الخدمات الصحية المختلفة أثناء الكارثة أو الظروف العادية.

الكلمات الدالة: كوفيد-19، الجمهور، التصور، الصيدلي، التوعية، الخدمات الصحية، الأردن.

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