

# Public's Perception of Pharmacy Services during Coronavirus (COVID-19) in Saudi Arabia

**Yousef Ahmed Alomi\***,  Bsc. Pharm, Msc. Clin pharm, BCPS, BCNSP, DiBA, CDE Critical Care Clinical Pharmacists, TPN Clinical Pharmacist, Freelancer Business Planner, Content Editor and Data Analyst, P.O.BOX 100, Riyadh 11392, Riyadh, SAUDI ARABIA

**Sultan Mohammed Al-Jarallah,** Head, Ambulatory Care Pharmacy, Oncology and Haematology Clinical Pharmacist, Pharmaceutical Care Department, Security Forces Hospital, Riyadh, SAUDI ARABIA.

**Dona Abdullah Alajmah,** Pharm. D, Batterjee Medical College, Jeddah, SAUDI ARABIA.

**Shatha Alhassan Alnami,** Pharm. D, Jazan University, Jazan, SAUDI ARABIA.

## Correspondence:

**Dr. Yousef Ahmed Alomi,** Bsc. Pharm, msc. Clin pharm, bcps, bcNSP, DiBA, CDE Critical Care Clinical Pharmacists, TPN Clinical Pharmacist, Freelancer Business Planner, Content Editor and Data Analyst, P.O.BOX 100, Riyadh 11392, Riyadh, SAUDI ARABIA.

**Phone no:** +966 504417712

**E-mail:** yalomi@gmail.com

Received: 28-11-2020;

Accepted: 12-03-2021;

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## Access this article online



[www.ijpcs.net](http://www.ijpcs.net)

DOI:  
10.5530/ijpcs.2021.10.15

## ABSTRACT

**Goal:** To exemplify the public's perception of pharmacy services during COVID-19 in Saudi Arabia. **Methods:** It is three cross-sectional of convenient sampling and calculated number of the subject with power eighty. It was a self-reported electronic survey for the population in the King of Saudi Arabia. It encompassed all citizens who lived in Saudi with age more than 18 years and above. The survey contained of the demographic data patient's perception of medication delivery service during COVID-19. Besides, the patient's experiences of drug information inquiries were linked with the pharmacist during COVID-19. Survey monkey, Microsoft Excel, and Statistical Package of Social Science (SPSS) were used in this study. **Results:** The total number of responding pharmacists was 461. Of those, 440 (95.44%) were Saudi, and 344 (74.62%) were female, with statistical significance between nationality or gender answers ( $p < 0.001$ ). Almost two-thirds of the responders had bachelor's degrees 319 (69.20%) with statistically noteworthy between among all academic qualifications ( $p < 0.001$ ). Most of the responders were non-healthcare professionals 338 (74.45%), and physicians and nurses illustrative high percentages 37 (35.92%) and 31 (30.10%), respectively, with statistically significant among the remaining answers ( $p < 0.001$ ). The total average scores of patient's perception of medication delivery service during COVID-19 were 2.50. The high scores element was answering drug information inquiries (3.30), medications home delivery (2.80), and requesting medications through a mobile application (2.78). The total average scores of patient's experiences of drug information inquiries communicated with a pharmacist during COVID-19 were 2.76 with high scores element was the drug administration inquiries (3.37). In addition, dosage/schedule inquiries (3.29) and Pharmacoeconomics/medications cost inquiries (3.18) were also entailed. **Conclusion:** The public's perception of medication delivery service and experiences of drug information inquiries transferred with the pharmacist during COVID-19 was not optimum. Therefore, targeting a strategic plan of hospital and community pharmacy services during pandemic situations is highly suggested. In addition, further studies of hospital and community pharmacy services individually during a pandemic or emergency public health are mandatory in Saudi Arabia.

**Key words:** Public, Perception, Pharmacy, Services, COVID-19, Saudi Arabia.

## INTRODUCTION

New viral diseases confronted the countries in the world developed pandemic situations. The World Health Organization called the new virus SARS-2 or coronary viral infection in 2019 or COVID-19.<sup>[1,2]</sup> All countries were under emergency public health circumstances. Each country offers various health care services none-health services to their citizens. Saudi Arabia was one of the perfect countries that delivered differently for their citizens and residents.<sup>[3]</sup> For health care services, the government has formulated a higher national committee toward this pandemic, organize controlling room buildings to deal with pandemic situations hour by hour and day by day through the Saudi centre for disease control.<sup>[3]</sup> The command and control administration of Ministry of Health had received all health information about new cases of infection by COVID-19, recovery cases, follow-up cases, hospital admission, critical or death cases.<sup>[3]</sup> All those cases were familiar through the dashboard and various applications. They were a daily report issued about all previous

claims and decisions made accordingly.<sup>[3]</sup> There were lengthened hospital beds and additional temporary hospitals when needed. Besides, they delivered various COVID-19 vaccines to cover all populations in Saudi Arabia. Numerous pharmacy services are presented through pharmacies by governmental or private sectors.<sup>[1,2]</sup> The Saudi Food Drug Authority (SFDA) organized the mask, hand sanitizer with community pharmacies and showed by internet website and application (Sehhaty). Thus, the community pharmacies brought medications and associated products, emphasizing hand sanitizer or alcohol swab through regular dispensing or home delivery services through the internet and mobile applications.<sup>[4]</sup>

Community pharmacies bring medications and associated products, emphasizing hand sanitizer or alcohol swab through regular dispensing or home delivery services through the internet and mobile applications.<sup>[4]</sup> Recently, the community pharmacy affords immunization services (COVID-19 vaccines) to the patient. The hospital

pharmacy applied the home delivery and mail pharmacy systems to give the patient medicines.<sup>[1]</sup> Besides, all pharmacists follow the Ministry of Health guidelines to prevent COVID-19 and international organizations guidelines.<sup>[4]</sup> Moreover, the pharmacist played an active role in providing enough medication supply at the hospitals or primary care centres, recognised therapeutic management guidelines, and patient education about medications like other countries.<sup>[1,2,4,5]</sup> Various instruction provided by the local pharmacy society and local investigators encourages the pharmacist to implement the operational activities role during COVID-19.<sup>[1,2,5,6]</sup> In all the earlier pharmacy services, the patient was the foundation of receiving the benefits. However, patients' perception about pharmacy services during COVID-19, accentuating medication delivery service and drug information inquiry was critical. Few studies were directed about the patient perception of pharmacy services during a pandemic situation of COVID-19 worldwide.<sup>[7]</sup> However, few or nil studies were conducted about patient's perception of pharmacy services during COVID-19 locally or in Gulf and Arabic countries.

## METHODS

It is a two-month cross-sectional study of the public's perception of pharmacy services during COVID-19 in Saudi Arabia. It was a self-reported electronic survey for the population in the king of Saudi Arabia. It incorporated all citizens who lived in Saudi with age more than 18 years and above. Any incomplete reports or locations outside of Saudi Arabia will be omitted from the study. The survey entailed of demographic data, including locations, gender, marital status, age, responder qualifications, occupational status, and monthly income. Further, it includes the second part of the patient's perception of medication delivery service during COVID-19. Besides, the patient's experiences of drug information inquiries were communicated with the pharmacist during COVID-19. The 5-point Likert response scale system was used. The sample was intended according to the previous literature with unlimited population size, a population percentage of 50%, a confidence level of 95% with z score of 1.96, margin of error of 5%, and a drop-out rate of 10%. As a result, the sample size will equal 251 to 432 with a power of study of 80%.<sup>[8-10]</sup> The response rate mandatory of calculated sample size at least 60-70% and above.<sup>[10,11]</sup> The survey was dispersed through social media and telegram during July and August 2020. The reminder message had been sent every 2-3 weeks. The survey was authenticated through the revision

of expert reviewers and pilot testing. Besides, the reliability tests McDonald's  $\omega$ , Cronbach's  $\alpha$ , Guttman's  $\lambda_2$ , and Guttman's  $\lambda_6$  had been completed with the study. The data analysis is finished through the survey monkey system, the Statistical Package of Social Sciences (SPSS), and Jeffery's Amazing Statistics Program (JASP). Besides, the Microsoft excel sheet version 16 with description and frequency analysis, good of fitness analysis, correlation analysis, inferential analysis of factors marks pharmacists' perceptions of forensic pharmacy. The STROBE (Strengthening the reporting of observational studies in epidemiology statement: guidelines for reporting observational studies) steered the reporting of the contemporary study.<sup>[12,13]</sup>

## RESULTS

The total number of responding pharmacists was 461, with most of them coming from the south area 211 (45.77%), and west area 154 (33.41%) with statistically important among the regions ( $p < 0.001$ ). Of those, 440 (95.44%) were Saudi, and 344 (74.62%) were female, with statistical significance between nationality or gender answers ( $p < 0.001$ ). Most of the responders were in age (18-24) years 174 (39.19%) with statistically momentous between all ages level ( $p < 0.001$ ). Almost two-thirds of the responders had bachelor's degrees 319 (69.20%) with statistically significant between among all academic qualifications ( $p < 0.001$ ). Most responders were students 186 (40.35%) and employees 144 (31.24%), and monthly income less than 3,000 SR was 197 (46.14%) statistically significant among the remaining answers ( $p < 0.001$ ). Most of the responders were non-healthcare professionals 338 (74.45%), and physicians and nurses illustrative high percentages 37 (35.92%) and 31 (30.10%), respectively, with statistically significant among the remaining answers ( $p < 0.001$ ). The majority of responders contacted with community pharmacies 282 (62.81%) or hospital pharmacies 115 (25.61%) more frequently, while rarely 171 (37.92%) or sometimes 119 (26.39%) communicate with pharmacist statistically significant between among the answers ( $p < 0.001$ ). There is a medium positive association between Age (years) and monthly income Kendall's tau\_b (0.563) or Spearman's rho (0.677) with statistically significant difference ( $p > 0.05$ ) as discovered in Table 1 and 2.

The total average scores of patient's perception of medication delivery service during COVID-19 were 2.50. The high scores element was answering drug information inquiries (3.30), medications home delivery (2.80), and requesting medications through a mobile

application (2.78). On the contrary, the lowest score was mail medications deliver (1.86), requesting medical devices and instruments through online internet (2.19), screening blood pressure and blood glucose (2.20), and medical apparatus and instruments home delivery (2.22) with statistically significant between answers ( $p < 0.001$ ) as explored in Table 3. The total average scores of patient's experiences of drug information inquiries communicated with a pharmacist during COVID-19 were 2.76 with high scores element was the drug administration inquiries (3.37). In addition, dosage/schedule inquiries (3.29), pharmacoeconomics/medications cost inquiries (3.18), and drug indications inquiries (3.13). On the contrary, the lowest score aspect of the patient's experiences of drug information inquiries was the medication's wastage inquiries (2.09) and alternative medicine inquiries (2.26). Besides, the herbal medicine inquiries (2.33) with statistically significant between answers ( $p < 0.001$ ) as reconnoitred in Table 4. The reliability test of McDonald's  $\omega$ , 0.954, Cronbach alpha 0.954, Guttman's  $\lambda_2$ , 0.958, and Guttman's  $\lambda_6$ , 0.978.

Factors persuading the perception of patient's perception of medication delivery service during COVID-19 and patient's experiences of drug information inquiries communicated with a pharmacist during COVID-19. Using independent samples Kruskal-Wallis test and the Bonferroni correction for multiple tests have adjusted significant values, the results showed as follows.

The various factors (location, employment, age (years), nationality, gender, educational level, monthly income, and the responders from healthcare professionals) might bearing the patient's perception of pharmacy services or the patient's experiences of drug information inquiries. However, there are no statically significant differences in influencing the patient's perception of pharmacy services or the patient's experiences of drug information inquiries and those factors ( $p > 0.05$ ). Except, five employment classes affected the patient's experiences of drug information inquiries with the unemployed average score was 2.6500, and students average score was 3.3109 with statically momentous differences ( $p = 0.000$ ) as explored in Table 5.

The relationship between the patient's perception of medication delivery service during COVID-19 or the patient's experiences of drug information inquiries interconnected with a pharmacist during COVID-19 and factors location, employment, age (years), nationality, gender, educational level, monthly income, and does the responders from a healthcare professional. It confirmed through

**Table 1: Demographic, social information.**

Nationality	Response Count	Response Percent	P value
Central area	54	11.71%	0.000
North area	13	2.82%	
South area	211	45.77%	
East area	29	6.29%	
West area	154	33.41%	
Answered question	461		
Skipped question	0		
Gender	Response Count	Response Percent	P value
Saudi	440	95.44%	0.000
Non-Saudi	21	4.56%	
Answered question	461		
Skipped question	0		
Gender	Response Count	Response Percent	P value
Male	117	25.38%	0.000
Female	344	74.62%	
Answered question	461		
Skipped question	0		
Age	Response Count	Response Percent	P value
< 18	19	4.28%	0.000
18-24	174	39.19%	
25-30	68	15.32%	
31-35	29	6.53%	
36-40	34	7.66%	
41-45	32	7.21%	
46-50	27	6.08%	
> 50	61	13.74%	
Answered question	444		
Skipped question	17		

a multiple regression model and considered the patient's perception of pharmacy services delivered dependent variables and factors regarded as explanatory variables. As a result, there was a weak relationship  $R(0.102)$  with ( $p=0.816$ ) between the patient's perception of pharmacy services delivered. Besides, there was a weak relationship  $R(0.167)$  with ( $p=0.214$ ) between the patient's experiences of drug information inquiries or the patient's experiences of drug information inquiries communicated with the pharmacist during COVID-19 and factors. Therefore, there is no positive or negative relationship between the patient's perception of pharmacy services provided or the Patient's experiences of drug information inquiries communicated with the pharmacist during COVID-19. Furthermore, all factors with non-statistically significant ( $p>0.05$ ) through multiple regression model

and confirmed by Bootstrap model as discovered in Table 6 and 7.

## DISCUSSION

The pharmacy services are snaky in the hospital and community pharmacies in Saudi Arabia and away in the world.<sup>[14-18]</sup> The hospital pharmacy is increasing in the drug distribution system services and clinical pharmacy services.<sup>[17,19,20]</sup> However, the community pharmacy is snowballing in the drug distribution system, not in clinical pharmacy services. During COVID-19, numerous drug distribution and clinical pharmacy services variations were altered from a traditional face-to-face delivery system to a fully online system. The drug distribution change to home or might mail delivery.<sup>[21-25]</sup> The changes encompassed regular prescribing with paper or electronic systems to online internet or

applications. As a result, the current study is to to examine the patient's perception of pharmacy services during COVID-19.

The existing electronic legalized with a high-reliability survey, dispersed to patients in the south and west region in Saudi Arabia. Most responders came from two areas because the author was working their distribution mainly at their locations. Most of the responders were young females same gender as an author, which is very easy to interaction females than males. Three-quarter of responders was non-healthcare providers, which was our target. However, knowledge of healthcare professionals is desirable to compare with the public one. Most responders communicated with community pharmacies more than hospitals because it was easier to contact and safer during pandemic situations than healthcare institutions.

The average score of patients' perception of pharmacy services did not influence an acceptable level. The patients had a higher perception of pharmacy providing drug information services, medications home delivery, and applications in requesting medications during the COVID-19 period. However, not all community pharmacies carry those services at the same level. It is highly suggested that all community pharmacies apply home delivery with mobile applications for requesting medications or devices. The patients had a poor perception of mail medications delivery because most of the community did not exploit mail pharmacy services. Recently, the MOH using mail pharmacy services during COVID-19 to deliver the medication to the patient home through Saudi post.<sup>[26]</sup> The patients had a poor perception of screening of blood glucose or blood pressure done by the pharmacy. Besides, the public responders had a poor perception of home delivery of the medications device or instruments, and community pharmacies did not afford the services for unknown reasons. Recently, the updated pharmacy law permits the community to deliver essential examinations or basic blood glucose or blood pressure, medical devices, public education, and immunization services.<sup>[27]</sup> Thus, the new approved services will surge patient outcomes, patient satisfaction and declare the role of pharmacists at the community pharmacies.

The existing examination results displayed the patients' experiences of drug information were not good, although all electronic facilities are available. It might be linked to community pharmacy services provided to the patients. Patients during pandemic situations are highly desirable for many healthcare inquiries, and it is up-front for them to contact the community

Table 2: Demographic, social information.			
Responder Qualifications	Response Count	Response Percent	
Doctorate degree	18	3.90%	0.000
Master degree	30	6.51%	
Bachelor Degree	319	69.20%	
Diploma	25	5.42%	
High school	56	12.15%	
Intermediate School	12	2.60%	
Primary School	0	0.00%	
Not educated	1	0.22%	
Answered question	461		
Skipped question	0		
Occupational status	Response Count	Response Percent	
Employee	144	31.24%	0.000
Unemployed	70	15.18%	
Student	186	40.35%	
Retired	57	12.36%	
Not written	4	0.87%	
Answered question	461		
Skipped question	0		
Monthly income	Response Count	Response Percent	
< 3,000 SR	197	46.14%	0.000
3,001-6,000	33	7.73%	
6,001-9,000	33	7.73%	
9,001-12,000	46	10.77%	
12,001-15,000	49	11.48%	
15,001-18,000	25	5.85%	
18,001-21,000	18	4.22%	
>21,000 SR	26	6.09%	
Answered question	427		
Skipped question	34		

Continued...

Are you a health care practitioner (Medical Doctor- Dentist- Pharmacist- Nurse- Others?)	Response Count	Response Percent	
Yes	116	25.55%	0.000
No	338	74.45%	
Answered question	454		
Skipped question	7		
If you are a health care practitioner, you are a	Response Count	Response Percent	
Physician	37	35.92%	0.000
Nurse	31	30.10%	
Nutritionist	17	16.50%	
Pharmacist	7	6.80%	
Laboratory	4	3.88%	
Radiology	2	1.94%	
Physiotherapy	3	2.91%	
Other (please specify)	2	1.94%	
Answered question	103		
Skipped question	358		
Which type of pharmacies are you more frequent communication	Response Count	Response Percent	
Hospital pharmacy	115	25.61%	
Community pharmacies	282	62.81%	
Primary healthcare pharmacy	60	13.36%	
Private hospital pharmacies	38	8.46%	
Non	12	2.67%	
Answered question	449		
Skipped question	12		
How do you frequently communicate with the pharmacist?	Response Count	Response Percent	
Always	31	6.87%	0.000
Most of the time	54	11.97%	
Sometimes	119	26.39%	
Rarely	171	37.92%	
Never	76	16.85%	
Answered question	451		
Skipped question	10		

pharmacy beside his house. Hotline 937 drug information services are obtainable to answer all medical or pharmacy inquiries at MOH services.<sup>[28,29]</sup> However, the community pharmacy is highly commended to provide drug information services and answering drug information inquiries supporting the MOH services. The cost of drug information services is high. However, the community pharmacy can distribute drug information services through applications or point of sale places. Besides, the patients might use the

community pharmacy commutation to answer their inquiries or use the 973 instead of the community pharmacy.<sup>[28,29]</sup> Most of type drug information inquiries do not variation from the pandemic and regular days.<sup>[28]</sup> The most common type was drug administration and dosing schedule, while the most minor types of drug information inquiries were drug wastage and herbal or alternative medications because most of public using regular drugs and do not use the herbal drug.

Various factors might move the patient's perception of pharmacy services or the patient's experiences of drug information inquiries during COVID-19 including location, employment, age, gender, nationality, education level, monthly income, and public or healthcare professionals. Not all those factors exaggerated the patient's perception of pharmacy services or experiences of drug information inquiries. There is no statistically significant difference between public or healthcare professionals. There is only redundancy and student more

**Table 3: Patient's perception of medication delivery service during COVID-19.**

	Always		Most the time		Sometimes		Rarely		Never اقلها		Total	Weighted Average	p-value
	%	n	%	n	%	n	%	n	%	n			
Medications home delivery	19.30%	87	14.20%	64	21.80%	98	16.90%	76	27.80%	125	450	2.80	0.000
Mail medications deliver	7.30%	32	7.00%	31	10.20%	45	15.70%	69	59.80%	263	440	1.86	0.000
Answering of Drug information inquiries	33.60%	149	15.80%	70	19.80%	88	9.00%	40	21.80%	97	444	3.30	0.000
Requesting medications through mobile application	23.40%	105	10.90%	49	17.60%	79	16.90%	76	31.20%	140	449	2.78	0.000
Requesting medications through online internet	18.70%	86	9.00%	40	13.20%	59	15.50%	69	43.00%	192	446	2.46	0.000
Screening blood pressure and blood glucose	12.30%	55	5.80%	26	17.90%	80	17.90%	80	46.20%	207	448	2.20	0.000
Medical devices and instruments home delivery	14.50%	65	7.80%	35	13.40%	60	14.10%	63	50.20%	255	448	2.22	0.000
Requesting medical devices and instruments through mobile application	14.90%	67	7.10%	32	13.40%	60	15.80%	71	47.50%	219	449	2.24	0.000
Requesting medical devices and instruments through online internet	14.10%	65	6.30%	28	13.80%	62	15.00%	67	50.40%	226	448	2.19	0.000
Cosmetics home delivery	19.20%	86	11.80%	53	15.80%	71	14.30%	64	38.00%	175	449	2.58	0.000
Requesting cosmetics through mobile application	20.70%	93	13.10%	59	17.60%	79	12.90%	58	35.60%	160	449	2.70	0.000
Requesting cosmetics through online internet	20.60%	92	12.10%	54	21.30%	95	12.60%	56	33.40%	149	446	2.74	0.000
Answered											456		
Skipped											5		

perception of drug information inquiries than other occupational types, which differed from the previous study.<sup>[7]</sup> It is related to demand for drug information during pandemic situations COVID-19. The pharmacy services should be upgraded, emphasizing community pharmacy, including all prescribed or over-the-counter medications or devices, cosmetics, and herbal medications.<sup>[24,30-33]</sup> It also includes the new implementation of mail pharmacy and using

applications or internet drug information during pandemic situations.

### Limitations

Although very informatics information had been reconnoitred from the patient's perception of pharmacy services, numerous limitations encompassed the responder's un-equal distribution in the locations, age, gender, academic qualifications, employment, and monthly income. Besides, the age levels

came from females and a young age with student qualifications. Therefore, further studies are necessitated with equal distribution of previous elements.

### CONCLUSION

The public's perception of pharmacy services during COVID-19 in Saudi Arabia highlights the patient's perception of medication delivery. The patient's experiences of drug information

**Table 4: Patient's experiences of drug information inquiries communicated with a pharmacist during COVID-19.**

	Always		Most the time		Sometimes		Rarely		Never		Total	Weighted Average	
	%	n	%	n	%	n	%	n	%	n			
Adverse drug reaction inquiries	20.10%	88	13.30%	58	20.80%	91	20.80%	91	24.90%	109	437	2.83	0.000
Drug Availability inquiries	27.0%	117	14.7%	64	20.5%	89	17.3%	75	20.5%	89	434	3.10	0.000
Dosage/schedule inquiries	34.2%	150	13.7%	60	19.6%	86	12.1%	53	20.3%	89	438	3.29	0.000
Drug of choice/therapeutics/ Pharmacology inquiries	26.9%	118	13.9%	61	24.0%	105	12.6%	55	22.6%	99	438	3.10	0.000
Drug Identification inquiries	23.9%	104	14.3%	62	25.7%	112	14.7%	64	21.4%	93	435	3.05	0.000
Drug Administration inquiries	35.4%	153	13.2%	57	21.8%	94	11.8%	51	17.8%	77	432	3.37	0.000
Pharmacoeconomics/medications cost inquiries	27.4%	119	17.3%	75	21.2%	92	14.1%	61	20.0%	87	434	3.18	0.000
Pregnancy/lactation/teratogenicity inquiries	21.0%	91	6.7%	29	16.9%	73	11.5%	50	43.9%	190	433	2.49	0.000
Poisoning/Toxicology inquiries	16.2%	70	7.9%	34	15.0%	65	17.1%	74	43.8%	189	432	2.36	0.000
Drug-Drug Interaction inquiries	25.0%	108	11.8%	51	17.8%	77	17.1%	74	28.2%	122	432	2.88	0.000
Drug-food interaction inquiries	19.3%	89	10.2%	47	18.7%	86	17.6%	81	28.4%	131	434	2.73	0.000
Drug and laboratory information inquiries	15.7%	68	10.6%	46	18.1%	78	15.5%	67	40.0%	173	432	2.47	0.000
Medications Storage inquiries	19.4%	84	8.8%	38	16.7%	72	17.8%	77	37.3%	161	432	2.55	0.000
Drug indications inquiries	31.1%	134	12.1%	52	20.4%	88	12.1%	52	24.4%	105	431	3.13	0.000
Withdrawal medications	17.4%	75	8.3%	36	16.7%	72	15.3%	66	42.4%	183	432	2.43	0.000
Over the counter medications inquiries	19.8%	85	13.0%	56	23.7%	102	14.4%	62	29.1%	125	430	2.80	0.000
Herbal medicine inquiries	14.3%	62	8.1%	35	17.1%	74	17.5%	76	43.1%	187	434	2.33	0.000
Alternative medicine inquiries	12.3%	53	9.0%	39	16.9%	73	16.4%	71	45.4%	196	432	2.26	0.000
Medication's wastage inquiries	10.6%	46	6.9%	30	16.2%	70	12.9%	56	53.3%	231	433	2.09	0.000
Therapeutic interchange inquiries	17.8%	77	11.3%	49	25.2%	109	14.8%	64	30.8%	133	432	2.71	0.000
Answered											448		
Skipped											12		

inquiries communicated with the pharmacist were insufficient. There are no differences in the perception between public or healthcare providers in the perception. Therefore, no factors affect the responders of Patient's perception of pharmacy services. More pharmacy applications with drug consultation, medication and devices requesting, and home or mail delivery systems are highly suggested during pandemic situations or emergency public health in Saudi Arabia.

## CONFLICT OF INTEREST

The Authors declare that there is no Conflict of Interest.

## Funding

Non.

## Consent for Publications

Informed consent was obtained from all the participants.

## Ethical Approval

This research was exempted from research and ethical committee or an institutional review board (IRB) approval.

<https://www.hhs.gov/ohrp/regulations-and-policy/decision-charts-2018/index.html>

## ABBREVIATIONS

**MOH:** Ministry of Health; **KSA:** Kingdom of Saudi Arabia; **SPSS:** Statistical Package of Social Sciences; **JASP:** Jeffery's Amazing Statistics Program; **Strobe:** Strengthening the reporting of observational studies in epidemiology statement: guidelines for

reporting observational studies; **SFDA:** Saudi Food and Drug Authority; **CBAHI:** Saudi Central Board for Accreditation of Healthcare Institutions.

## ORCID ID

Yousef Ahmed Alomi <https://orcid.org/0000-0003-1381-628X>

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**Table 5: Factors influencing the perception of Patient's perception of pharmacy services and Patient's experiences of drug information inquiries during COVID-19 (average scores).**

	Factors	Patient's perception of pharmacy services							Patient's experiences of drug information inquiries						
		N	Average scores	Std. D	Median	Lower Bound	Upper Bound	P-value	N	Average scores	Std. D	Median	Lower Bound	Upper Bound	P-value
Region	Central	49	2.6742	1.05829	2.4167	2.3703	2.9782	0.854	48	3.0729	1.51584	3.0000	2.6328	3.5131	0.408
	North	12	2.5000	.93406	2.1250	1.9065	3.0935		12	2.6250	1.00284	3.0000	1.9878	3.2622	
	South	180	2.4545	.84838	2.2500	2.3297	2.5792		176	2.6591	1.48333	3.0000	2.4384	2.8798	
	East	24	2.6780	1.08087	2.3750	2.2216	3.1344		23	2.8261	1.56386	3.0000	2.1498	3.5023	
	West	134	2.5060	.89283	2.3750	2.3535	2.6586		129	2.6047	1.38867	2.0000	2.3627	2.8466	
	Total	399							388						
Employment	Employee	143	2.5807	.88461	2.5000	2.4345	2.7270	0.096	118	2.2203	1.30506	2.0000	1.9824	2.4583	0.000
	Unemployed	69	2.4380	.88464	2.2500	2.2255	2.6505		60	2.6500*	1.33181	2.7500	2.3060	2.9940	
	Student	178	2.4176	.90737	2.0833	2.2834	2.5518		156	3.3109*	1.43610	3.0000	3.0838	3.5380	
	Retried	57	2.7495	.98831	2.7500	2.4872	3.0117		51	2.0686	1.24908	2.0000	1.7173	2.4199	
	Not written	4	2.1875	.55850	2.2917	1.2988	3.0762		3	1.6667	1.15470	1.0000	1.2018	4.5351	
	Total	451							388						
Age	< 18	18	2.0311	.63471	1.7386	1.7155	2.3468	0.420	17	3.2647	1.42651	3.0000	2.5313	3.9981	0.433
	18-24	154	2.5269	.88512	2.2500	2.3860	2.6678		152	2.7434	1.42934	3.0000	2.5144	2.9725	
	25-30	59	2.6180	.96120	2.4167	2.3675	2.8685		57	2.8860	1.54115	3.0000	2.4770	3.2949	
	31-35	26	2.6836	.96570	2.3750	2.2935	3.0736		26	2.9808	1.75773	3.0000	2.2708	3.6907	
	36-40	29	2.3028	.80913	2.1818	1.9950	2.6105		29	2.5000	1.39514	2.0000	1.9693	3.0307	
	41-45	30	2.5151	.90263	2.5417	2.1781	2.8521		29	2.6207	1.49795	2.0000	2.0509	3.1905	
	46-50	25	2.5448	.89209	2.4167	2.1766	2.9131		23	2.3478	1.30936	2.0000	1.7816	2.9140	
	> 50	58	2.5368	.99125	2.2083	2.2762	2.7975		55	2.3818	1.27281	2.0000	2.0377	2.7259	
	Total	399							388						
Nationality	Saudi	379	2.5183	.90363	2.3333	2.4271	2.6096	0.528	368	2.7038	1.44868	3.0000	2.5553	2.8523	0.959
	Non-Saudi	20	2.4239	.99509	2.1326	1.9581	2.8896		20	2.6500	1.50525	2.0000	1.9455	3.3545	
	Total	399							388						
Gender	Male	105	2.5720	.91920	2.4167	2.3932	2.7507	0.598	99	2.4848	1.42223	2.0000	2.2012	2.7685	0.091
	Female	299	2.4930	.90375	2.2500	2.3895	2.5966		289	2.7751	1.45402	3.0000	2.6067	2.9434	
	Total	404							388						
Academic Qualification	Doctorate	18	2.2454	.92199	2.0000	1.7869	2.7039	0.651	18	2.3333	1.50489	2.0000	1.5850	3.0817	0.827
	Master	29	2.5384	.95859	2.1667	2.1738	2.9030		28	2.5714	1.35205	2.0000	2.0472	3.0957	
	Bachelor	275	2.5541	.92509	2.4167	2.4443	2.6639		267	2.7041	1.45693	3.0000	2.5286	2.8797	
	Diploma	22	2.6023	.92329	2.3333	2.1929	3.0116		22	2.8182	1.53177	2.7500	2.1390	3.4973	
	High school	47	2.4014	.77894	2.1667	2.1726	2.6301		46	2.8478	1.45629	3.0000	2.4154	3.2803	
	Intermediate School	8	2.0492	.64389	1.7500	1.5109	2.5876		7	2.7143	1.41000	2.5000	1.4103	4.0183	
	Total	399							388						
Income	< 3,000 SR	185	2.4848	.85949	2.2500	2.3601	2.6094	0.253	182	2.7830	1.45214	3.0000	2.5706	2.9954	0.141
	3,001-6,000	30	2.3604	.92470	2.0000	2.0151	2.7056		29	3.1379	1.55779	3.0000	2.5454	3.7305	
	6,001-9,000	32	2.4536	1.00722	2.1742	2.0905	2.8167		30	2.7333	1.57422	2.2500	2.1455	3.3212	
	9,001-12,000	41	2.3248	.76570	2.1667	2.0831	2.5665		39	2.8205	1.48451	3.0000	2.3393	3.3017	
	12,001-15,000	46	2.7603	.93645	2.7917	2.4823	3.0384		45	2.4333	1.21356	2.0000	2.0687	2.7979	
	15,001-18,000	23	2.6525	1.11516	2.2500	2.1703	3.1347		22	2.7045	1.63051	2.5000	1.9816	3.4275	
	18,001-21,000	18	2.8674	.85873	2.6667	2.4404	3.2945		17	2.1765	1.23669	2.0000	1.5406	2.8123	
	>21,000 SR	24	2.4583	1.03531	2.2083	2.0212	2.8955		24	2.1875	1.34174	2.0000	1.6209	2.7541	
	Total	399							388						
Are you from a health care professional	Yes	109	2.5666	.84173	2.2500	2.4068	2.7264	0.444	109	2.8440	1.49799	3.0000	2.5596	3.1284	0.216
	No	290	2.4937	.93138	2.2727	2.3860	2.6013		279	2.6452	1.42923	2.5000	2.4767	2.8136	
	Total	399							388						

**Table 6: Multiple regression of Factors with the Patient's perception of pharmacy services provided during COVID-19.**

	Model	R	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
						B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.106 <sup>b</sup>	0.011	0.553	.816 <sup>b</sup>	2.832	.419		6.753	.000	2.008	3.657		
	Location					-.017-	.038	-.025-	-.464-	.643	-.091-	.056	.862	1.161
	Employment					-.042-	.044	-.053-	-.959-	.338	-.129-	.044	.844	1.184
	Age (years)					-.004-	.029	-.011-	-.144-	.885	-.062-	.054	.447	2.235
	Nationality					-.068-	.215	-.016-	-.317-	.751	-.492-	.355	.943	1.060
	Gender					-.026-	.110	-.013-	-.238-	.812	-.242-	.190	.893	1.119
	Educational level					.005	.053	.006	.101	.920	-.099-	.110	.794	1.260
	Monthly income					.027	.030	.068	.915	.361	-.031-	.085	.455	2.200
	Are you from a health care professional					-.074-	.109	-.036-	-.674-	.501	-.289-	.141	.877	1.140

a. Dependent Variable: Patients Actual Experiences, Predictors: (Constant), Location, Site of work, Age, Nationality, Gender, Educational level, Monthly income, Are you from the health care professional (Medical Doctor- Dentist- Pharmacist- Nurse- Others),

Bootstrap for Coefficients							
Model	B	Bootstrap <sup>a</sup>				95% Confidence Interval	
		Bias	Std. Error	Sig. (2-tailed)	Lower	Upper	
1 (Constant)	2.832	-.018-	.438	.001	1.897	3.637	
Location	-.017-	-.001-	.042	.677	-.101-	.065	
Site of work	-.042-	.000	.045	.368	-.130-	.044	
Age (years)	-.004-	.000	.032	.901	-.066-	.061	
Nationality	-.068-	-.001-	.246	.797	-.529-	.432	
Gender	-.026-	.003	.109	.787	-.248-	.193	
Educational level	.005	.005	.053	.915	-.093-	.114	
Monthly income	.027	.003	.030	.352	-.029-	.094	
Are you from a health care professional	-.074-	-.003-	.115	.533	-.306-	.130	

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

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**Table 7: Multiple regression of Factors with the Patient's experiences of drug information inquiries communicated with a pharmacist during COVID-19.**

	Model	R	R Square	F	Sig.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
						B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.167 <sup>b</sup>	0.028	1.358	.214 <sup>b</sup>	2.967	.670		4.428	.000	1.650	4.285		
	Location					-.046-	.060	-.041-	-.760-	.448	-.164-	.073	.865	1.157
	Employment					-.066-	.071	-.051-	-.930-	.353	-.206-	.074	.848	1.179
	Age (years)					-.020-	.048	-.032-	-.418-	.676	-.113-	.074	.450	2.222
	Nationality					-.114-	.342	-.017-	-.333-	.739	-.786-	.558	.941	1.062
	Gender					.244	.177	.073	1.375	.170	-.105-	.592	.900	1.111
	Educational level					.054	.086	.036	.629	.530	-.115-	.222	.798	1.252
	Monthly income					-.048-	.047	-.076-	-1.015-	.311	-.141-	.045	.454	2.201
	Are you from a health care professional					-.126-	.174	-.039-	-.725-	.469	-.468-	.216	.880	1.136

a. Dependent Variable: Patients Actual Experiences, Predictors: (Constant), Location, Site of work, Age, Nationality, Gender, Educational level, Monthly income, Are you from the health care professional (Medical Doctor- Dentist- Pharmacist- Nurse- Others),

#### Bootstrap for Coefficients

Model	B	Bootstrap <sup>a</sup>				95% Confidence Interval	
		Bias	Std. Error	Sig. (2-tailed)	Lower	Upper	
1 (Constant)	2.967	-.035-	.628	.001	1.636	4.131	
Location	-.046-	.002	.061	.442	-.163-	.076	
Site of work	-.066-	.002	.069	.333	-.197-	.066	
Age (years)	-.020-	-.001-	.047	.656	-.121-	.069	
Nationality	-.114-	.003	.339	.743	-.747-	.546	
Gender	.244	.008	.171	.160	-.097-	.579	
Educational level	.054	.000	.086	.526	-.110-	.234	
Monthly income	-.048-	.002	.045	.283	-.138-	.047	
Are you from a health care professional	-.126-	.004	.179	.487	-.471-	.228	

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

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