



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

HOSTED BY



Contents lists available at ScienceDirect

Saudi Pharmaceutical Journal

journal homepage: www.sciencedirect.com



Original article

Pharmaceutical services department strategies and patient perception to maintain healthcare services during COVID-19 crisis

Hager Salah^a, Omar Alsamani^{a,b,*}, May Hassan ElLithy^a, Lamyaa Samir Abdelghani^a

^aPharmaceutical Services Department, King Hamad University Hospital, Bahrain

^bPharmacy Program, Allied Health Department, College of Health Sciences. University of Bahrain, Bahrain

ARTICLE INFO

Article history:

Received 12 December 2021

Accepted 7 September 2022

Available online xxxx

Keywords:

SARS2-CoV-2

Face-to-Face Counseling

Patient Perceptions

Pharmaceutical Care

Remote Services

ABSTRACT

Background: In March 2020, the World Health Organization (WHO) declared Severe Acute Respiratory Syndrome Coronavirus 2 (SARS2-CoV-2) as global pandemic. This health crisis has overwhelmed the healthcare system, leading to unprecedented morbidity and mortality rates. During this pandemic, pharmacies tried to maintain their services either through remote services or face-to-face dispensing and consultation.

Objectives: This study aimed to share the strategies and plans adopted by the pharmaceutical services department to maintain the healthcare services during the SARS2-CoV-2 crisis and evaluate the patient's perspective.

Methods: A cross-sectional analytical survey was conducted among patients/patient relatives who attended King Hamad University Hospital (KHUH) outpatient pharmacies in the Kingdom of Bahrain between February 2021 and May 2021. Patients have two options: either to submit the survey online through barcode scanning or to fill it as a physical paper and submit it to the pharmacy staff (Online-based and paper-based). A total of 641 responses were received. Hospital applied safety logistics to ensure staff and patient safety.

Results: Post-hoc analysis revealed that patients aged between 20 and 39 years had less agreement than patients ≤ 19 years old in terms of preferring to continue the same services after the pandemic ($p = 0.009$). More level of understanding of pharmacy services was seen among patients with higher educational levels compared to elementary and secondary levels in cases of services related to adverse events ($p = 0.038$) and wrong/missed medication rectification ($p = 0.018$). Unemployed patients were more in agreement than employed ones regarding continuing the same procedure after the pandemic, services related to wrong/missed medication rectification, and safety while staying in the pharmacy waiting area.

Conclusion: Most patients were satisfied with the face-to-face counseling, pharmacy-adapted strategies, and services during the SARS2-CoV-2 pandemic. Face-to-face service during the pandemic was equally comfortable across all age groups and gender.

© 2022 The Author(s). Published by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

In March 2020, the World Health Organization (WHO) declared Severe Acute Respiratory Syndrome Coronavirus 2 (SARS2-CoV-2),

reported and discovered in Wuhan, China, in December 2019, as a global pandemic. This virus has affected around 40 million confirmed cases, and 1.1 million confirmed deaths worldwide ([World Health Organization, 2019](#)). On the other hand, the actual number might be much higher than what was reported officially. On February 24, 2020, the first confirmed case of SARS-CoV-2 was discovered in the Kingdom of Bahrain for a male who arrived from Iran via Dubai. Cases increased till it reached around 70,000 positive patient on September 23, 2020, however, recovery and death rate found to be 89.41% and 0.34% respectively till that date ([The National Medical Taskforce for Combating the Coronavirus, 2020](#)). Governments and institutions worldwide took preventive actions to control the infection, such as closing schools and public attractions, implementing travel bans, quarantines, and nation-

* Corresponding author.

E-mail addresses: hager.salah@rocketmail.com (H. Salah), omaralsamani@hotmail.com, oalsamani@uob.edu.bh (O. Alsamani), pharmayalithy@gmail.com (M.H. ElLithy), Lamyaa_ghani81@yahoo.com (L.S. Abdelghani).

Peer review under responsibility of King Saud University.



Production and hosting by Elsevier

<https://doi.org/10.1016/j.jsps.2022.09.006>

1319-0164/© 2022 The Author(s). Published by Elsevier B.V. on behalf of King Saud University.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Please cite this article as: H. Salah, O. Alsamani, M.H. ElLithy et al., Pharmaceutical services department strategies and patient perception to maintain healthcare services during COVID-19 crisis, Saudi Pharmaceutical Journal, <https://doi.org/10.1016/j.jsps.2022.09.006>

wide lockdowns (Centers for Disease Control and Prevention, 2020; United Nations Development Programme, 2020). This health crisis has overwhelmed the healthcare system, leading to unprecedented morbidity and mortality rates. The effects of this crisis were not limited to the patients and healthcare professionals due to the contagious nature of this disease, resulting in the shortage of workforce (Foundation et al., 2020). In addition, pharmacies play a vital role in managing this health crisis. Therefore, multiple pharmaceutical institutions such as The American Society of Health-Systems Pharmacists (ASHP) and the International Pharmaceutical Federation (FIP) have issued assessment tools and resources to assist pharmacists during urgent times (International Pharmaceutical Association, 2020). Outpatient pharmacy services in King Hamad University Hospital (KHUH) responded to this pandemic by incorporating multiple changes and adaptations in their daily process and workflow. According to a recent studies, pharmacies have opted to serve their customers through remote services, including telepharmacy, which applies pharmaceutical services through spatial distance and prescriptions delivery services (Adkins, 2020; Mohamed Ibrahim et al., 2021; Zheng et al., 2021; Kane-Gill and Rincon, 2019). On the other hand, some pharmacies continue conducting face-to-face dispensing and consultation while taking the recommended precautions to limit the spread of the infection. This study aimed to share the strategies and plans adopted by the pharmaceutical services department to maintain the healthcare services during the SARS2-CoV-2 crisis and evaluate the patient's perspective.

2. Methodology

2.1. Logistics changed to collect medication from a pharmacy

During this global pandemic, we strongly believed that face-to-face services with full precautions could achieve maximum patient's benefit and satisfaction. Consequently, our plan and strategies were built to allow the patients to get their services face-to-face with maximum precautions to minimize the infection rate to zero.. Aiming to minimize the infection rate, the pharmacy

was re-designed adapting social distance recommendations, and all patients entering the hospital premises will be screened through no-touchable thermometers. First, patients will be seen in the out-patient clinics through teleconsultation or physical attendance according to the patient's health condition. Once the patient finishes his/her consultation with the physician, a prescription will be added to the electronic system. The pharmacist can validate the order and contact the prescriber in case of any clarification before the patient reaches the pharmacy. Once the prescription is ready for dispensing, the patient will receive a short message on his/her phone that their prescriptions are ready and can be collected from the pharmacy within a specific date and time. Finally, patients will present to the pharmacy according to their appointment to get their medications and to be counseled by the pharmacist (Fig. 1). Furthermore, a post on social media was announced to ensure that all patients would be familiar with the new process (Fig. 2).

2.2. Study design/time frame

A cross-sectional analytical survey study was conducted among patients/patient relatives who attend King Hamad University Hospital (KHUH) outpatient pharmacies in the Kingdom of Bahrain between February 2021 and May 2021. Patients have two options: either to submit the survey online through barcode scanning or to fill it as a physical paper and submit it to the pharmacy staff (Online-based and paper-based). The study participants were adults above 18 years old who received outpatient medical care at different outpatient clinics and received their medications from the out-patient pharmacy. A total of 641 responses were received.

2.3. Data collection tool

The questionnaire divided into three parts (A total of 26 questions) was used to evaluate the impact on process-of-care outcomes from patient perceptions about the SARS2-CoV-2 crisis that the pharmaceutical services department adopted. Before data collection, a pilot study consisting of 10 participants was carried out to ensure clarity and reliability of the questionnaire. The ques-

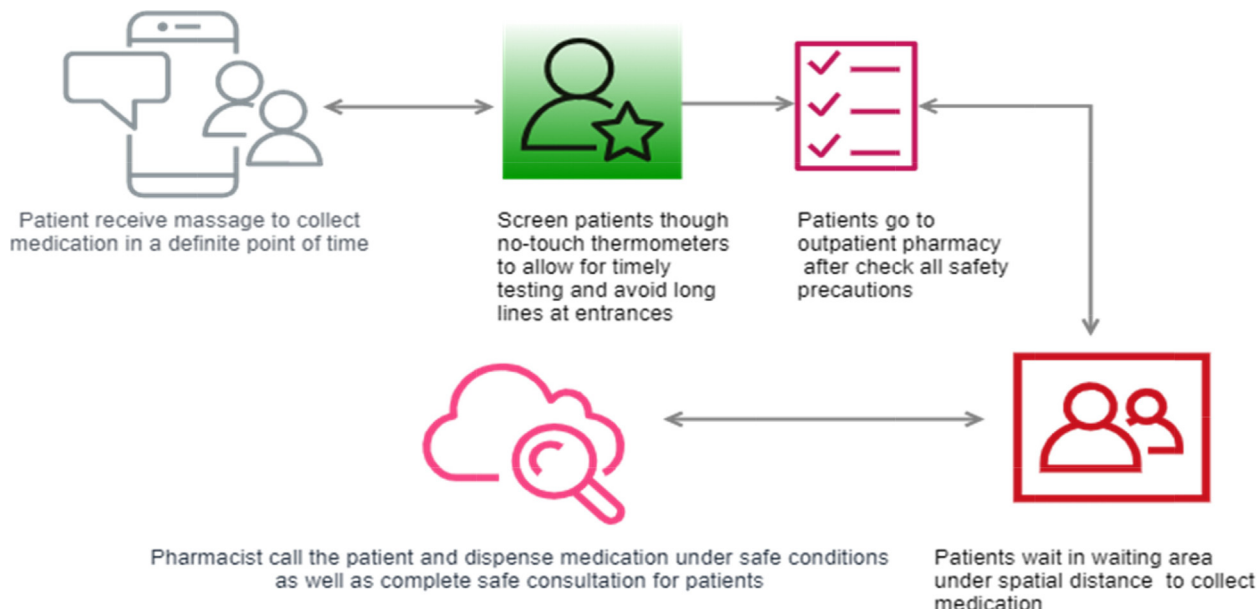


Fig. 1. Organizational strategies to address patient safety issues arising from the current COVID-19 pandemic response.



Fig. 2. Announced social media post to educate the patient about new dispensation process.

tionnaire validity was calculated using a Cronbach's alpha test, and the pilot analysis of the overall survey responses indicates a good internal consistency with a Cronbach's alpha of 0.95. Factor analysis revealed two main components, each having a good internal consistency with Cronbach's alpha 0.95 and 1.00. All questions were constructed in Arabic and English.

- Part 1 (Demographic Data):** 8-item self-structured question; evaluating socio-demographic data of the study participants, which included: age, gender, marital status, education level, and work status. In addition to data related to health status, SARS2-CoV-2 status, and visiting reason.
- Part 2 (main survey):** 13-item self-structured question measured by the 5-point Likert scale. Final response scores were identified as: strongly agree, agree, neutral, disagree, and strongly disagree. All 13 items concerned about Experience with the pharmacy services were good during the SARS2-CoV-2 pandemic.
- Part 3 (Short Patient Satisfaction Survey):** 5-item self-structured question representing the overall service during the pandemic.

2.4. Ethical consideration

All data were anonymous and confidential; no one was obliged to participate in the study. The research department at King Hamad University Hospital has revised the questionnaire, and ethical approval was obtained from the institutional review board "IRB number: 21-394".

2.5. Statistical analysis

Data were collected, coded, and analyzed using; Statistical Package for Social Science (SPSS) version 25 (IBM, USA). Frequency distribution, percentage, and descriptive statistics, including mean \pm S.D were calculated. Chi-Square Test of Independence was used to determine an association between categorical variables, and an independent student T-test was used to detect differences between categories regarding scale variables. Binary logistic regression was used to identify the determinants of satisfaction. P values of ≤ 0.05 were considered significant.

Table 1

Demographic and participants characteristics (Total participants = 641).

Demographic variable	Frequency (%)
Gender	
Male	339 (52.9%)
Female	302 (47.1%)
Age range	
≤ 19	120 (18.7%)
20–39	251 (39.2%)
40–59	143 (22.3%)
≥ 60	127 (19.8%)
Marital Status	
Single	131 (20.4%)
Married	470 (73.3%)
Divorced	18 (2.8%)
Widower	22 (3.4%)
Education Level	
Unlettered	11 (1.7%)
Elementary	36 (5.6%)
Secondary	211 (32.9%)
Diploma	82 (12.8%)
University	301 (47.0%)
Work Status	
Unemployed	131 (20.4%)
Employee	307 (47.9%)
Retired	159 (24.8%)
Student	44 (6.9%)
SARS2-CoV-2 Status	
Contact with SARS2-CoV-2 patient	19 (3.0%)
Never infected or contact positive SARS2-CoV-2 patient	543 (84.7%)
Recovered from SARS2-CoV-2	79 (12.3%)
Health Status	
Healthy	315 (49.1%)
Chronic	326 (50.9%)
Visit Aim	
New prescription	373 (58.2%)
Refill prescription	268 (41.8%)

3. Results

3.1. Demographic and participants characteristics

A total of 641 patients participated in this study; none of the responses were received in-complete or eliminated for any reason reflecting a 100% response rate. Similar percentage between males

Table 2
Pharmacy adaptation strategies and services during SARS2-CoV-2 pandemic satisfaction survey.

Survey	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1 - Experience with the pharmacy services was good during the SARS2-CoV-2 pandemic.	286 (44.6%)	275 (42.9%)	51 (8.0%)	14 (2.2%)	15 (2.3%)
2- My attendance in the pharmacy (under precautions to get my remedy) was necessary.	279 (43.5%)	261 (40.7%)	66 (10.3%)	24 (3.7%)	11 (1.7%)
3- Receiving a message to get my medications before attendance to the pharmacy was effective.	252 (39.3%)	194 (30.3%)	115 (17.9%)	44 (6.9%)	36 (5.6%)
4- I felt safe during my visit to the pharmacy.	272 (42.4%)	241 (37.6%)	78 (12.2%)	32 (5.0%)	18 (2.8%)
5- Teleconsultation experience was useful.	233 (36.3%)	242 (37.8%)	105 (16.4%)	40 (6.2%)	21 (3.3%)
6- Pharmacists maintained all the precautions required during SARS2-CoV-2.	311 (48.5%)	246 (38.4%)	64 (10.0%)	13 (2.0%)	7 (1.1%)
7 -The pharmacy provided all medications I required, and the supply was not affected by the pandemic	321 (50.1%)	244 (38.1%)	45 (7.0%)	20 (3.1%)	11 (1.7%)
8- Clear instructions are placed at the pharmacy regarding SARS2-CoV-2 precautions.	322 (50.2%)	235 (36.7%)	50 (7.8%)	23 (3.6%)	11 (1.7%)
9- I did not wait longer than 10 mins to collect my medications.	261 (40.7%)	202 (31.5%)	88 (13.7%)	51 (8.0%)	39 (6.1%)
10- The consultation of a pharmacist and clarification of instructions for your medicines are important	314 (49.0%)	251 (39.2%)	55 (8.6%)	14 (2.2%)	7 (1.1%)
11- I prefer to continue with the same procedure after the pandemic.	292 (45.6%)	239 (37.3%)	60 (9.4%)	25 (3.9%)	25 (3.9%)
12- The electronic technology used in teleconsultation and dispensing is effective in reducing contact.	274 (42.7%)	238 (37.1%)	87 (13.6%)	24 (3.7%)	18 (2.8%)
13- The refill cabinet was easy to reach and helpful	208 (32.4%)	190 (29.6%)	120 (18.7%)	72 (11.2%)	51 (8.0%)

Table 3
Overall satisfaction survey:

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1- I received full instructions regarding the medications	323 (50.4%)	250 (39.0%)	49 (7.6%)	11 (1.7%)	8 (1.2%)
2- If I got an adverse event from medication, the pharmacist immediately contacts the prescriber or my primary physician to change the medication	227 (35.4%)	251 (39.2%)	121 (18.9%)	24 (3.7%)	18 (2.8%)
3- If there was a problem with my medication (wrong dose/missed medication), the pharmacist immediately contacts the prescriber to fix out the problem	253 (39.5%)	231 (36.0%)	111 (17.3%)	20 (3.1%)	26 (4.1%)
4- If I needed to stay in the waiting area, I felt safe during that time	252 (39.5%)	252 (39.3%)	94 (14.7%)	29 (4.5%)	13 (2.0%)
5- The overall service during the pandemic was comfortable	274 (42.7%)	271 (42.3%)	61 (9.5%)	23 (3.6%)	12 (1.9%)

and females included in this study (339 males (52.9%) compared to 302 females (47.1%) respectively) where the majority (470 patients (73.3%)) were married. The majority of the patients (251 (39.2%)) were between 20 and 39 years old, with a mean age of 43.5 ± 15.4 . Concerning the educational level and work status, the majority of the participants had a university degree 301 (47%) and were employed (307 (47.9%)). On the other hand, 543 (84.7%) patients had never been infected or were in contact with positive SARS2-CoV-2 patients. Patients in this study were either healthy individuals (315 (49.1%)) who came to collect their relative prescription or patients with chronic conditions (326 (50.9%)) who came by themselves to receive their prescriptions. In addition, participants presented to the pharmacy either to receive newly prescribed medications (373 (58.2%)) or to refill chronic prescriptions (268 (41.8%)) (Table 1).

3.2. Pharmacy adaptation strategies and services during SARS2-CoV-2 pandemic satisfaction survey

Responses in Table 2 presented patient's satisfaction in regard to pharmacy adaptation strategies and services provided during

the SARS2-CoV-2 pandemic. Elements patients were asked to be evaluated were built to reflect all adapted strategies and services provided to the clients, which include: precautions, dispensation process and technology utilization, waiting time, pharmacists counseling and performance, medication availability/supply, feeling safe, and preference to continue with the same strategies after the pandemic. In general, the highest percentage of the participants either strongly agree or agree with the strategies and services provided by the pharmacy during that period, reflecting high satisfaction and safety feelings from the clients. In addition, more than 80% of the participants strongly agreed/agree that their presence at the pharmacy to get their medications, face-to-face counseling by the pharmacist were necessary, and the pharmacist's instruction and counseling were clear. Moreover, 261 participants (40.7%) and 202 participants (31.5%) strongly agreed or agreed respectively that their pharmacy waiting time did not exceed 10 min. Furthermore, 292 participants (45.6%) were comfortable with the adapted strategies/new process. They preferred to continue with it even after the end of the pandemic compared to 50 participants (7.8%) who preferred to return to the normal process after the pandemic ended (Table 2).



Fig. 3. Overall Satisfaction across various demographics.

3.3. Overall satisfaction survey

An overall satisfaction survey consists of five elements given to the clients. The first three elements were aimed to evaluate pharmacists' clinical services and counseling, fourth element measured client's safety feelings, and the last element measured the client's overall satisfaction. As detailed in Table 3, participants generally showed a high satisfaction rate as the majority either strongly agree or agree with all five elements.. Moreover, concerning the

various demographic characteristics of the clients, the majority of the clients were satisfied with the pharmacy-adapted strategies and services during the SARS2-CoV-2 pandemic (Fig. 3).

3.4. Univariate analysis for the level of agreement for pharmacy services.

Post-hoc analysis revealed that patients aged between 20 and 39 years had less agreement compared to patients ≤ 19 years

Table 4
Univariate analysis for the level of agreement for pharmacy services.

	Received full instruction regarding the medication	An adverse event was addressed appropriately	Wrong dose/ missed medication was rectified	Felt safe during staying in the pharmacy waiting area	The overall service during the pandemic was comfortable	Prefer to continue with the same procedure after the pandemic
Age						
≤19	4.31 ± 0.82	4.00 ± 0.92	4.15 ± 0.88	4.20 ± 0.78	4.31 ± 0.78	4.39 ± 0.82
20–39	4.35 ± 0.78	3.93 ± 1.02	3.89 ± 1.14	4.00 ± 1.01	4.13 ± 0.90	4.06 ± 1.03
40–59	4.39 ± 0.85	4.05 ± 1.00	4.18 ± 0.85	4.02 ± 1.04	4.14 ± 0.99	4.00 ± 1.23
≥60	4.36 ± 0.72	4.08 ± 0.86	4.02 ± 1.04	4.25 ± 0.79	4.29 ± 0.82	4.33 ± 0.78
P value	p = 0.58	p = 0.58	p = 0.16	p = 0.13	p = 0.20	p = 0.009*
Gender						
Male	4.32 ± 0.83	4.03 ± 0.94	4.03 ± 1.08	4.12 ± 0.92	4.20 ± 0.88	4.18 ± 0.98
Female	4.38 ± 0.75	3.97 ± 1.00	4.04 ± 1.08	4.06 ± 0.97	4.20 ± 0.89	4.14 ± 1.05
P value	p = 0.52	p = 0.51	p = 0.40	p = 0.60	p = 0.97	p = 0.96
Education						
Unlettered	4.00 ± 0.77	3.90 ± 0.94	4.18 ± 0.60	4.36 ± 0.50	4.18 ± 0.60	4.45 ± 0.52
Elementary	4.33 ± 1.04	4.25 ± 1.02	4.33 ± 1.04	4.25 ± 1.02	4.16 ± 1.18	4.30 ± 1.09
Secondary	4.45 ± 0.67	4.12 ± 0.89	4.16 ± 0.95	4.18 ± 0.89	4.27 ± 0.88	4.18 ± 0.98
Diploma	4.30 ± 0.73	4.00 ± 0.87	3.98 ± 0.96	4.07 ± 0.91	4.21 ± 0.80	4.26 ± 0.96
University	4.31 ± 0.85	3.89 ± 1.03	3.92 ± 1.09	4.01 ± 0.98	4.15 ± 0.88	4.09 ± 1.04
P value	p = 0.14	p = 0.038*	p = 0.018*	p = 0.15	p = 0.40	p = 0.37
Work Status						
Unemployed	4.44 ± 0.69	4.19 ± 0.86	4.25 ± 0.87	4.28 ± 0.86	4.37 ± 0.77	4.38 ± 0.80
Employee	4.37 ± 0.80	3.99 ± 1.00	4.00 ± 1.09	4.00 ± 1.01	4.14 ± 0.95	4.04 ± 1.10
Retired	4.27 ± 0.85	3.89 ± 0.98	3.95 ± 1.03	4.15 ± 0.84	4.20 ± 0.82	4.25 ± 0.92
Student	4.25 ± 0.83	3.95 ± 0.93	3.88 ± 0.84	3.97 ± 0.95	4.11 ± 0.92	4.00 ± 1.12
P value	p = 0.25	p = 0.06*	p = 0.02*	p = 0.03*	p = 0.10*	p = 0.019*
SARS2-CoV-2 Status						
Contact with SARS2-CoV-2 patient	4.21 ± 0.97	3.73 ± 0.99	3.89 ± 1.10	4.15 ± 0.76	4.36 ± 0.59	3.98 ± 1.24
Never infected or contact positive SARS2-CoV-2 patient	4.36 ± 0.78	4.00 ± 0.98	4.02 ± 1.05	4.10 ± 0.95	4.21 ± 0.89	4.18 ± 1.01
Recovered from SARS2-CoV-2	4.31 ± 0.84	4.11 ± 0.89	4.17 ± 0.79	4.02 ± 0.93	4.07 ± 0.88	4.13 ± 0.97
P value	p = 0.79	p = 0.26	p = 0.64	p = 0.64	p = 0.20	p = 0.52
Health Status						
Healthy	4.38 ± 0.79	4.03 ± 0.99	4.04 ± 1.06	4.05 ± 0.98	4.15 ± 0.93	4.12 ± 1.08
Chronic	4.32 ± 0.79	3.96 ± 0.97	4.03 ± 0.99	4.14 ± 0.90	4.27 ± 0.83	4.23 ± 0.91
P value	p = 0.39	p = 0.52	p = 0.84	p = 0.67	p = 0.23	p = 0.57
Visit aim						
New prescription	4.31 ± 0.84	3.96 ± 1.00	3.97 ± 1.06	4.03 ± 1.00	4.16 ± 0.91	4.11 ± 1.05
Refill prescription	4.41 ± 0.71	4.06 ± 0.92	4.13 ± 0.96	4.18 ± 0.85	4.25 ± 0.85	4.23 ± 0.95
P value	p = 0.32	p = 0.23	p = 0.06*	p = 0.14	p = 0.24	p = 0.22

old, in terms of preferring to continue the same services after the pandemic ($p = 0.009$). More level of understanding of pharmacy services was seen among patients with higher educational levels compared to other education levels in terms of services related to adverse events ($p = 0.038$) and wrong/missed medication rectification ($p = 0.018$) as shown in tablet 4. Unemployed patients were more in agreement than employed in terms of continuing the same procedure after the pandemic, services related to wrong/missed medication rectification, and safety while staying in the pharmacy waiting area (Table 4).

4. Discussion

This study evaluates patients' perceptions of organizational strategies to address workforce and patient safety issues arising from the current SARS2-CoV-2 pandemic response. Concerns about contracting SARS2-CoV-2 at the hospital stemmed from fears that the hospital was not a safe environment. Patients were concerned that the uncertainty regarding medication collection from the hospital would cause infection with SARS2-CoV-2, and it is unnecessary to collect them from the hospital through physical attendance and it would be much better to receive their medications through home delivery service. In addition, home delivery

services or mail-order pharmacies were not a popular dispensing method prior to the pandemic, as it found that less than 10% of the retail pharmacies in the U.S offer home delivery services or mail-order (IQVIA, 2019). However, after changing the logistics inside the pharmacy to create a safe environment, patients functioned as advocates for attending and communicating with pharmacists regarding their medications in a very safe environment.

In accordance to maintain pharmaceutical services during the pandemic, pharmacies were between two burdens; either deliver the medications through home delivery services or mail-order pharmacies without a huge focus on patient counseling or focus more on face-to-face counseling and allow the patients to attend physically to the pharmacy to get their medications. However, some pharmacies decided to be in the middle; an example of those pharmacies is what happened in Australia, where they limit their home delivery services to special populations includes: people over 70 years of age, people taking multiple medications for multiple chronic conditions, parents with new babies or pregnant women, and those in home isolation (Parajuli et al., 2022). On the other hand, in KHUH we decided to be in the middle and to focus on both points; supplying the medication and patient's counseling; therefore, a maximum level of infection control precautions was taken to create a safe environment for the patients which was

highly accepted and appreciated by the patients as shown in Tables 2 and 3.

Pharmacy staff took many precautions listed by international standards to protect the clients from the infection (U.S Food and Drug Administration, 2020). It was found that patients preferred to attend the hospital premises and contact pharmacists to clarify everything about their medications, emphasizing the importance of a pharmacist's role in the hospital and patient interaction (McLeod et al., 2019; Lada and Delgado, 2007). Medication supply was one of the major challenges faced by governments and hospitals worldwide (ASHP, 2020). Therefore, when preparing for and responding to the pandemic, pharmacy teams prioritized ensuring their supply to ensure maximum adherence and patient compliance with their medication and reduce the patient's disease burden (Osterberg and Blaschke, 2005; Kaye et al., 2020). As reported in the national plus survey of the U.S. Department of Health and Human Services (DHHS) released in March 2020, many hospitals have changed their strategies in order to address multiple challenges revolving around the safety of staff and patients. This includes maintaining the availability of personal protective equipment as well as medications. According to our participants' responses, we have fulfilled that requirement and achieved maximum protection and supply for most patients' needs (Public Law 116–136, 2019; Adkins, 2020).

In addition, the outcome and the aim of this research could be improved if it was linked to the patient clinical outcome (Positive or negative outcome). As reflected in Tables 2 and 3 that the majority of the patients were satisfied with the changes that took place during the COVID-19 crisis, on the other hand, these changes were not tested nor evaluated against the clinical outcome if it had a positive or a negative impact. Comparing the number of adverse effects, medication errors, or patient's compliance before the COVID-19 crisis and after implementing these precautions are suitable parameters to evaluate these changes clinical impacts.

5. Conclusion

To sum up, proactive actions and plans are usually associated with a better outcome. In this study, there were multiple strategies adapted by the pharmaceutical services department to assure the continuity of the medical services and medications supply. In fact, there were two options to maintain the services either by providing home delivery services or allowing the patients to come to the pharmacy to get their prescriptions. With a total belief in the importance of pharmacist's consultation, processes were modified to allow the patients to get their medications directly from the pharmacy with the maximum precautions. The majority of the patients were satisfied with the face-to-face counseling, pharmacy-adapted strategies, and services during the SARS2-CoV-2 pandemic. In addition, this study confirmed the importance of interaction with pharmacists under proper management and safety precautions, diminishing patients' fears during pandemics.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Adkins, K., 2020. COVID-19 and science communication: Exit only: harms from silencing employee voice. *J. Sci. Commun.* 19, 1–18. <https://doi.org/10.2323/2.19050203>.
- ASHP, n.d. Drug Shortages Statistics [WWW Document]. ASHP. URL <https://www.ashp.org/drug-shortages/shortage-resources/drug-shortages-statistics?loginreturnUrl=SSOCheckOnly> (accessed 10.30.20).
- Centers for Disease Control and Prevention, 2020. How to Protect Yourself and Others [WWW Document]. CDC. URL <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html> (accessed 9.27.20).
- U.S Food and Drug Administration, 2020. Personal Protective Equipment for Infection Control | FDA [WWW Document]. FDA. URL <https://www.fda.gov/medical-devices/general-hospital-devices-and-supplies/personal-protective-equipment-infection-control> (accessed 3.30.21).
- Foundation, E., Influenza, P., Education, P., 2020. ASHP COVID-19 Pandemic Assessment Tool for Health-System Pharmacy Departments. International Pharmaceutical Association, 2020. FIP Call to action: To support pharmacists and pharmacy workers on the coronavirus/COVID-19 frontline 2.
- Kane-Gill, S.L., Rincon, F., 2019. Expansion of Telemedicine Services: Telepharmacy, Telesroke, Teledialysis, Tele-Emergency Medicine. *Crit. Care Clin.* 35, 519–533. <https://doi.org/10.1016/j.ccc.2019.02.007>.
- Kaye, L., Theye, B., Smeenk, I., Gondalia, R., Barrett, M.A., Stempel, D.A., 2020. Changes in medication adherence among patients with asthma and COPD during the COVID-19 pandemic. *J. Allergy Clin. Immunol. Pract.* 8, 2384–2385. <https://doi.org/10.1016/j.jaip.2020.04.053>.
- Lada, P., Delgado, G., 2007. Documentation of pharmacists' interventions in an emergency department and associated cost avoidance. *Am. J. Heal. Pharm.* 64, 63–68. <https://doi.org/10.2146/AJHP050213>.
- McLeod, M., Karampatakis, G.D., Heyligen, L., McGinley, A., Franklin, B.D., 2019. The impact of implementing a hospital electronic prescribing and administration system on clinical pharmacists' activities - A mixed methods study. *BMC Health Serv. Res.* 19, 1–12. <https://doi.org/10.1186/s12913-019-3986-4>.
- Mohamed Ibrahim, O., Ibrahim, R.M., Abdel-Qader, D.H., Al Meslamani, A.Z., Al Mazrouei, N., 2021. Evaluation of Telepharmacy Services in Light of COVID-19. <https://home.liebertpub.com/tmj> 27, 649–656. <https://doi.org/10.1089/TMJ.2020.0283>.
- Osterberg, L., Blaschke, T., 2009. Adherence to Medication. <https://doi.org/10.1056/NEJMra050100> 55, 68–69. <https://doi.org/10.1056/NEJMra050100>.
- Parajuli, D.R., Khanal, S., Wechkunanukul, K.H., Ghimire, S., Poudel, A., 2022. Pharmacy practice in emergency response during the COVID-19 pandemic: Lessons from Australia. *Res. Social Administ. Pharm.* 18 (8), 3453–3462.
- PUBLIC LAW 116–136–MAR. 27, 2020 [WWW Document], 2019. URL <https://www.congress.gov/116/plaws/publ136/PLAW-116publ136.pdf> (accessed 10.30.20).
- The National Medical Taskforce for Combating the Coronavirus, 2020. The National Medical Taskforce for Combating the Coronavirus (COVID-19) provided an update on the COVID-19 response in the Kingdom [WWW Document]. Bahrain Minist. Health. URL <https://www.moh.gov.bh/COVID19/Details/4434> (accessed 10.5.20).
- United Nations Development Programme, n.d. Socio-economic impact of COVID-19 [WWW Document]. United Nations Dev. Program. URL <https://www.undp.org/coronavirus/socio-economic-impact-covid-19> (accessed 9.27.20).
- World Health Organization, n.d. Coronavirus disease (COVID-19) [WWW Document]. WHO. URL <https://www.who.int/emergencies/diseases/novel-coronavirus-2019> (accessed 10.5.20).
- Zheng, S.-Q., Yang, L., Zhou, P.-X., Li, H.-B., Liu, F., Zhao, R.-S., 2021. Recommendations and guidance for providing pharmaceutical care services during COVID-19 pandemic: A China perspective. *Res. Soc. Adm. Pharm.* 17 (1), 1819–1824.