



satisfaction with pharmaceutical care,<sup>8</sup> Tertiary care hospitals,<sup>9</sup> Northern areas,<sup>1</sup> specialised hospitals,<sup>10</sup> Eastern regions,<sup>11</sup> and pharmacy care services in East Province.<sup>12</sup> These studies concluded that overall patient satisfaction with the hospital's pharmacy services was satisfactory. The findings revealed a deficiency in the interactions and efforts of pharmacists with patients, medication reconciliation, medication adherence, and pharmacy communication, all of which require pharmacists to focus more and improve. Another study suggested that staff skills and attitudes toward patients should be improved through training programs.<sup>10</sup>

A recent study of 746 patients attending outpatient pharmacies at a public hospital in the Al-Jouf region discovered that patients were dissatisfied with pharmacy facilities and patient counseling.<sup>1</sup> The patient satisfaction process may involve a variety of factors, including but not limited to service accessibility, wait time, medication availability, and pharmacy staff attitude toward providing medication information and counseling.<sup>10,13</sup> This study aimed to quantify the utilization of pharmaceutical services in hospitals in the Al-Jouf region, identifying the utilization of pharmaceutical services and the satisfaction of the beneficiaries in order to evaluate the quality of pharmaceutical services.

## MATERIALS AND METHODS

### Methods

#### *The Study Design and location*

A cross-sectional, descriptive, web-based study was conducted from January to July 2022 at Al-Jouf region of Saudi Arabia to assess utilization of pharmaceutical services and satisfaction of patients towards these services.

#### **Sampling Technique and Study population**

The study was conducted in Al-Jouf region of Saudi Arabia via an online structured survey. The questionnaire was distributed via social media, like Twitter and *WhatsApp*, to facilitate reaching considerable number of the participants. All Al-Jouf residents above 18 years who utilize the pharmaceutical services and those willing to participate, were included in this survey. The participants who did not agree to answer the survey's questions, the people who have severe clinical conditions or have mental retardation and those less than 18 years were excluded from this study.

#### **Data Collection form**

The questionnaire was distributed to the selected participants of Al-Jouf region. The survey was divided into four sections including demographics (Table 1) and utilization of the pharmaceutical services in terms of pharmaceutical services types and patterns (Table 2), patient counseling (Table 3), availability of medications,

the relationship between patient and pharmacist, considerations and satisfaction regarding the pharmaceutical services (Table 4).

### Statistics

The collected variables were descriptively analyzed by SPSS software version 23.0. with a significance level of 0.05 to assess utilization of pharmaceutical services and satisfaction of the patients. All categorical variables were reported as counts (n) and proportions (%). Chi-square test or student-t test was used to compare categorical and continuous data between the groups. One way Analysis of Variance (ANOVA) was used to compare the satisfaction score if there were more than two categories. Tukey's HSD was used for *post hoc* analysis. Effect size of the relationship between score and demographics were evaluated through Eta squared.

### Ethics

The participants were voluntarily accepted to participate in this study, also written informed consent was obtained from each participant. A brief description of the study objectives and purposes was also provided at the beginning of the study. The anonymity of respondents was ensured throughout the study. Ethical approval was obtained from the Deanship of Research at Jouf University, KSA (Reference no. 03-01-43).

## RESULTS

### Study Participants Characteristics

A total 201 respondents with the majority of Saudi citizens (99%), male preponderance (58.20%) participated in this study. Most of the participants had age 18-32 years (40.3%). The income-average those who have <5,000 SAR have high percentage (43.3%) followed by who have 5,000-10,000 SAR (24.9%). Regarding marital status, a large proportion of the population is married (59.7%). Most of the participants (82.1%) had no chronic disease, while 12.9% of respondents had one chronic disease (Table 1).

### Utilization of Pharmaceutical Services

#### *Provision of Pharmaceutical Services*

About 57% of participants indicated that they received information on the correct use of the medication both orally and in writing, while 81% indicated that consultations are the most common type of pharmaceutical service they receive. Most of the participants (73.5%) reported to get only one pharmaceutical service per month. Nearly 33% of participants indicated that they receive their medications immediately from the pharmacy, while 29.5% indicated that it takes them approximately 5 min to fill prescriptions at the pharmacy.

### Patient Counseling

Approximately 51% of patients were provided with information regarding drug interactions. Only 45.5% of participants reported

**Table 1: Demographic Characteristics of Study Participants.**

Characteristics	N (%)
<b>Gender</b>	
Male	117 (58.2%)
Female	84 (41.8%)
<b>Age (Years)</b>	
<18	4 (2%)
18-32	81 (40.3%)
33-45	59 (29.4%)
46-65	54 (26.9%)
>65	3 (1.5%)
<b>Occupation</b>	
Informal work	2 (1%)
Student	54 (26.9%)
Unemployed	6(1.51%)
Government employee	86 (42.8%)
Private employee	6 (3%)
Retired	24 (11.9%)
<b>Average Monthly income</b>	
<5 thousand SAR	87 (43.3%)
5-10 thousand SAR	50 (24.9%)
10-15 thousand SAR	20 (14.9%)
15-20 thousand SAR	23 (11.4%)
>20 thousand SAR	11 (5.5%)
<b>Marital Status</b>	
Widower	4 (2%)
Single	75 (37.3%)
Married	120 (59.7%)
Divorced	2 (1%)
<b>Nationality</b>	
Non-Saudi	2 (1%)
Saudi	199 (99%)
<b>Chronic diseases</b>	
None	165 (82.1%)
1	26 (12.9%)
2	8 (4%)
>2 Diseases	2 (1%)
<b>Smoking</b>	
Yes	57 (28.4%)
No	134 (66.7%)
Ex-Smoker	10 (5%)
<b>Special Needs</b>	
Yes	0 (0%)
No	201 (100%)

**Table 2: Utilization of the pharmaceutical services.**

Item	N (%)
<b>Pharmaceutical Services Provision</b>	
What kind of pharmaceutical services do you usually get?	
Consultation	162 (81%)
Dispensing and preparations	45 (22.5%)
Educations and information	34 (17%)
<b>How many pharmacy services do you get per month?</b>	
One monthly	147 (73.5%)
Two times	32 (16%)
Three times	11 (5.5%)
Four times	3 (1.5%)
Five and more	7 (3.5%)
<b>Is information on the correct use of the medicine provided orally or on paper?</b>	
Both	115 (57.5%)
Verbally only	38 (19%)
Written only	11 (5.5%)
None	36 (18%)
<b>Do you take time to get your medications from the pharmacy?</b>	
At no time	67 (33.5%)
Less than 2 min	47 (23.5%)
Less than 5 min	59 (29.5%)
5 min and more	27 (13.5%)
Availability of the medication	
<b>Were the medicines available at the pharmacy or were you struggling to get them?</b>	
Yes	108 (54%)
No	58 (29%)
Sometimes	34 (17%)

that received information on the correct way to store the medications. The majority of participants (85.5%) agreed that pharmacists respond to all of their health-related questions. More than half of respondents (55.5%) indicated that pharmacists did not inquire about the patient's health condition and diagnosis prior to dispensing medications.

### Availability of Medication

Approximately 54% of respondents reported that the medications were available at the pharmacy all the time.

### Satisfaction of Participants regarding Pharmaceutical Services

Most of the participants (62.5%) believed that robots can be replace pharmacist for better pharmacy services. Around one-third of study participants (32.5%) indicated that patients with special needs may experience difficulties in getting pharmaceutical services. A substantial proportion of study participants (41%) reported that pharmaceutical services in hospitals are useless and

weak. About half of the study participants ranked pharmaceutical services  $\leq 5$ , and only 22.5% reported pharmacy services at best.

## DISCUSSION

It is essential to measure the pharmaceutical services in order to identify its weak points and enhance them. In this study, we quantified the utilization of pharmaceutical services in hospitals in the Al-Jouf region and assessed the participants' satisfaction with these services. Understanding the cause is the first step in advancing public education.<sup>14-16</sup> Annually, drug-related issues cost the global economy \$42 billion,<sup>17</sup> and can be better controlled and reduced by integrating pharmaceutical care into healthcare services.<sup>18-21</sup> Clinical Pharmaceutical services reduce drug-related morbidity, prevent adverse reactions and hospitalizations<sup>22</sup> and can improve quality of life, especially for older adults with chronic conditions.<sup>23</sup> In addition, costs for diagnostic tests, hospitalizations, consultations, visits to other health services, and medications may be reduced.<sup>24</sup>

**Table 3: Services related to Patients' Counseling.**

Item	N (%)
Have you been provided information about the interactions between the medicines you are using?	
Yes	103 (51.5%)
No	97 (48.5%)
Is information provided on the correct way to store the medicine?	
Yes	91 (45.5%)
No	109 (54.5%)
Did the pharmacist provide you with information about the medicine and the method of use while delivering it to you?	
Yes	172 (86%)
No	28 (14%)
The relation between patient and pharmacist	
Have all your medical queries been answered?	
Yes	173 (86.5%)
No	27 (13.5%)
How many times did the pharmacist ask you about your health condition and diagnosis while administering the medicine?	
None	111 (55.5%)
1-5 times	73 (36.5%)
6-10 times	7 (3.5%)
More than 10 times	9 (4.5%)

The cost savings from implementing pharmaceutical care can amount to \$5,377 per adverse event avoided<sup>25</sup> and \$421,810 annually per clinically practicing pharmacist.<sup>26</sup> Strand *et al.* discovered a \$1,134,162 reduction in total expenses over a three-year period.<sup>27</sup>

Various systematic reviews and meta-analyses demonstrate significant results in terms of economic benefit, length of hospital stay, hospital admissions, mortality, and drug-related problem resolution; however, they also demonstrate that such results are only possible and conclusive when clinical pharmaceutical services employ systematic pharmacotherapy analysis.<sup>17,28</sup> It is evident that when patients are systematically monitored by a pharmacist, they may achieve better blood pressure, glycated hemoglobin, albuminuria, renal failure, and hyperlipidemia results, even among polymedicated elderly patients.<sup>17,29</sup>

As anticipated, the majority of respondents in this study were Saudi nationals, as healthcare services are provided through cooperative health insurance regulations and insurance packages, and only a small percentage of non-Saudi residents are permitted to receive healthcare services from government sectors.<sup>22</sup> The majority of respondents were young adults between the ages of 18 and 46 years who agreed to participate in the study, while only a few were senior citizens. This may be due to the willingness of young adults to participate in the survey via the Internet.<sup>17</sup>

The majority of study participants reported that consultations are the type of pharmaceutical services they typically receive. As part of their duties, a previous study revealed that pharmacists

hoped to provide personalized pharmaceutical consultations to resolve drug-related issues.<sup>17</sup> The majority of participants in this study receive monthly pharmaceutical services. This was also demonstrated in a prior study.<sup>30</sup>

According to our findings, the patients were given both verbal and written instructions on the proper administration of the drug. Providing written instructions in addition to oral instructions is beneficial for ensuring medication comprehension and correct administration.<sup>31</sup> More than 50% of participants require 2-5 min to retrieve their medications from the pharmacy. This time is considered to be dedicated to counseling and patient interaction. In community pharmacies, patient counseling should be emphasized more. Pharmacists should be encouraged to spend a minimum of 3 min per patient on counseling.<sup>32</sup>

The proper patient counseling was evident in this study based on the majority of participants' reports that they were provided with information about drug interactions and the proper use of drugs. In contrast, the majority of patients reported that they were not given instructions on how to properly store the medication. In this context, this aspect of the pharmaceutical services in hospitals in the Al-Jouf region must be enhanced.

A previous study also reported the importance of counseling elderly patients to avoid drug interactions.<sup>33</sup> Drug interactions are more prevalent in the elderly. Age-related changes in pharmacokinetics and pharmacodynamics, frailty, interindividual variability, reduced homeostatic mechanisms, and psychosocial issues must be considered when evaluating drug interactions.<sup>34</sup>

**Table 4: Satisfaction of study participants towards pharmacy services.**

Item	N (%)
1. Do you think it is possible to replace the pharmacist with robots to dispense medicines instead of people to provide a better service?	
Yes	33 (16.5%)
No	125 (62.5%)
May be	42 (21%)
2. Do you think that people with special needs may experience difficulties in obtaining pharmaceutical services?	
Yes	65 (32.5%)
No	57 (28.5%)
May be	78 (39%)
3. Do you think that the pharmacy services in hospitals are weak and useless?	
Yes	82 (41%)
No	118 (59%)
4. How do you rate the pharmacy services out of 10, where 10 are the best pharmacy services that can be found	
10	45 (22.5%)
9	20 (10%)
8	39 (19.5%)
7	36 (18%)
6	16 (8%)
5	28 (14%)
4	9 (4.5%)
3	4 (2%)
2	0 (0%)
1	3 (1.5%)

For optimal therapeutic outcomes, patient awareness of proper medication use is necessary. There is evidence that medication use is not always as safe and appropriate as it should be.<sup>35</sup> There is limited information on the costs associated with poor treatment outcomes resulting from a patient's lack of knowledge about how to administer the medication. Educating the patients could prevent at least some of these problems.

The majority of respondents indicated that the medications were available at pharmacies. This is a sign of the good quality of pharmaceutical services in hospitals in the Al-Jouf region. The unavailability of some drugs may be due to not being approved by the pharmacy and therapeutic committee in the hospital. Regarding the patient-pharmacist relationship, the majority of participants reported that their medical or pharmaceutical questions had been answered. However, according to the participants, the pharmacist did not inquire about their health condition and diagnosis before administering the medication. In spite of the fact that they should pay more attention to patients and ask them about their health condition and diagnosis while administering the medicine in order to achieve the best outcomes,

these results indicate a positive relationship between the patient and pharmacist in providing a drug information service that met its objectives of providing accurate, objective, and timely drug information. Similar findings have been reported previously.<sup>36</sup>

Regarding satisfaction with pharmaceutical services in hospitals in the Al-Jouf region, more than half of the participants rated the pharmacy services as eight or higher out of ten, where ten represents the highest quality pharmacy services. In addition, study participants reported that hospital pharmacy services are neither completely inadequate nor ineffective. These results demonstrate that participants are satisfied with the pharmaceutical services provided in Al-Jouf hospitals. It is well known that patient satisfaction is a significant factor in the success of a health-care organization; it is also regarded as a reliable indicator of the quality of health-care. Patient satisfaction is the result of a patient's health-care expectations being met by their actual experience.<sup>37</sup>

According to the study by Desta *et al.*, patient satisfaction is the response of a health-care recipient to the context, process, and

outcome of their service experience.<sup>38</sup> When customers receive excellent service, they typically inform nine to ten others. When customers receive excellent service, they typically inform nine to ten other people. The negative effects of customer dissatisfaction are greater than the positive effects of satisfaction. Patients' attitudes toward the pharmacy are positively influenced by their accumulation of satisfaction. Positive attitudes toward the pharmacy may improve patients' adherence and compliance with their treatment.<sup>37</sup>

To provide better service, approximately 16% of participants agreed that robots could replace pharmacists in the dispensing of medications. This small percentage indicates participant satisfaction with the hospital pharmacist's ability to provide pharmaceutical services.

A previous study concluded that pharmacists can have a greater impact on patient satisfaction by enhancing their interpersonal skills than by offering new services. However, patients' perceptions of how pharmacists can be involved in their care may be expanding beyond medication dispensing and counseling.<sup>39</sup> Numerous pharmacies are understaffed, necessitating that the pharmacist provide services alone. This may impede the pharmacist's ability to provide superior pharmaceutical services. A previous study, on the other hand, suggested that automation should be implemented in pharmacies in order to overcome the time barrier and free the pharmacist's time for clinical and consultation activities.<sup>39</sup>

Similar to numerous other industries, the pharmaceutical industry is gradually adopting technology. Hospitals can now implement dispensing robots to dispense medications more accurately and efficiently than ever before.<sup>39</sup> Robots have been installed in pharmacies across the globe, allowing pharmacy staff and patients to save time while experiencing minimal error. The robots can administer and prepare medications for patients in bags, as well as provide alerts for expiration dates and storage requirements.<sup>40</sup> In this context, pharmacies should be equipped with robots whenever possible and appropriate, freeing up the pharmacist's time for clinical services. Using non-pharmacist assistants may have a comparable effect. This can be accomplished by instituting an in-house training program that equips pharmacies with properly trained assistants, thereby allowing pharmacists to devote more time to other services. The government could consider providing financial assistance for innovative pharmaceutical services, as have been done in the past in UK.<sup>39</sup>

Most respondents indicated that people with special needs (disabled individuals) may have trouble obtaining pharmaceutical services. A previous study recommended the use of web-based communication services between disabled patients and pharmacists. Unfortunately, remote communications

caused difficulties in communicating with patients with low health literacy, older patients, disabled patients, immigrant communities with interpreter needs, and those without access to online communication facilities.<sup>41</sup> There is a need to design and implement particular interventions for patients with special needs.

Despite a number of significant findings from the analysis, the current study must be interpreted in light of the following limitations. This study does not address specific pharmacy services, such as educational interventions for patients with diabetes, hypertension, or dialysis. In addition, the study instrument lacks a comprehensive evaluation of pharmaceutical care services. Adding pharmaceutical care-specific questions to the research instrument will help stratify the level of patient satisfaction with traditional and extended pharmacy services. The sample size of this study was low (201 participants), this could be due to that most of the population in this region were preoccupied with work and does not have access to the questionnaire or unavailable to fill it out. The majority of the study's participants were young, limiting the findings' applicability to settings with chronic, elderly, and pediatric patients. Similarly, data were collected from a single region of KSA, limiting the generalizability of the findings to the entire country. In addition, the study did not assess the patients' health status, which may have confounded the interpretation of the results. Last but not least, the objective of this study complies with the Kingdom of Saudi Arabia's 2030 vision for world-class health facilities.

## CONCLUSION

It is essential to measure pharmaceutical services in order to identify areas of weakness and improve them. The majority of pharmaceutical services consist of consultations, and patients are given both verbal and written instructions on the correct administration of their medications. In this study, proper patient counseling was evident; however, the importance of providing information on how to store medications should be strengthened. Although there was a satisfactory relationship between the patient and pharmacist, the pharmacists did not inquire about the patient's health condition and diagnosis prior to administering the medication. More than half of the participants rated the pharmacy services as eight or higher out of ten.

Amendments of the pharmaceutical care policy in light of this study's findings is recommended in terms of type and quality of pharmaceutical services. When feasible and appropriate, pharmacies should be outfitted with robots or pharmacy assistants that free up the pharmacist's time for clinical services. To prevent potential difficulties in obtaining pharmaceutical services, a system utilizing web-based services should be developed to facilitate the communication between disabled patients and pharmacists.

## AUTHOR CONTRIBUTIONS

Concept, Experiment, data entry, writing, data analysis and interpretation: Ahmed D. Alatawi, Marwa O. Elgendy and Ahmed M. Sayed. Concept, planning of study design, and reviewing the manuscript: Ahmed D. Alatawi, Marwa O. Elgendy, Ahmed M. Sayed, Tauqeer Hussain Mallhi, Yusra Habib Khan, Abdulaziz Ibrahim Alzarea, Nasser Hadal Alotaibi, Abdullah Salah Alanazi.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## DATA AVAILABILITY STATEMENT

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

## ABBREVIATIONS

**KSA:** Kingdom of Saudi Arabia; **SPSS:** Statistical Package for Social Sciences; **ANOVA:** Analysis of Variance; **SAR:** Saudi Riyal.

## SUMMARY

This study evaluates utilization and satisfaction of patients towards pharmaceutical services in Al-Jouf region of Saudi Arabia. More than half of the participants indicated that they received information on correct use of medications during their visits to the hospital pharmacies. Consultation was reported as a most common form of pharmaceutical service in the region. Approximately, half of the study population reported that medications were available at pharmacy all the time. Most of the participants (86%) commented that all of their health-related queries were addressed during their visits. However, half of the study participants rated pharmacy services at 8 or more out of 10. These findings indicate that patients in Al-Jouf region of Saudi Arabia are satisfied with the pharmaceutical services provided in hospitals.

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