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Original Article

Assessing and Estimation of Patient's Satisfaction with Telemedicine Services in Qassim Region: A Cross-sectional Study

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Abstract

Telemedicine has emerged as a vital component of healthcare delivery, especially in regions like Qassim, characterized by geographical challenges. This cross-sectional study aimed to evaluate patients' satisfaction with telemedicine services in the Qassim Region, considering its unique demographics and healthcare landscape. By employing a quantitative research approach and a cross-sectional survey design, data was collected to assess various aspects of patient satisfaction, including service quality, accessibility, and communication efficiency. A sample size of approximately 352 patients was targeted using a convenience sampling method. Questionnaires were used to collect the data. Data analysis involved utilizing SPSS to summarize findings and identify significant patterns. the study reported that post-COVID-19, 50.34% of participants started using telemedicine, highlighting its rapid adoption during the pandemic. The primary use was for medical consultations (36.63%), emphasizing its role in routine healthcare. A major consensus (82.5%) saw telemedicine as a time-saver. It's also viewed as an essential component of patient care (82.2% agree or strongly agree) and necessary in rural and underserved areas (83.8% agreement). Regarding factors enhancing telemedicine experience, the most valued aspect is saving waiting times (22.13%), while the least influential factor was conducting laboratory tests through telemedicine (7.51%). Moreover, the study showed diverse satisfaction levels, with the majority feeling 'Satisfied' (46.23%) or 'Very satisfied' (29.80%). These findings collectively indicate the growing significance and acceptance of telemedicine, particularly in efficiency, patient care, and accessibility, with certain demographic factors influencing experience and satisfaction levels.

Keywords: Estimation of Patients' Satisfaction, Telemedicine Services, Cross-Sectional Study, Perceived Service Quality, Service Quality Dimensions.

Introduction

In recent years, telemedicine has emerged as a revolutionary force in the healthcare sector, offering an alternative to traditional in-person medical consultations (Simon, 2018). This is particularly relevant in the Qassim Region, where geographical and logistical challenges often impede access to healthcare services, especially in rural areas. The study aims to evaluate the effectiveness and reception of telemedicine services from the patients' perspective. It also seeks to identify the inherent challenges and opportunities in this growing field. Telemedicine, defined as the delivery of healthcare services through telecommunication technologies, allows for remote diagnosis, treatment, and patient education.

In the Qassim Region, with its unique demographic and geographic characteristics, telemedicine has the potential to bridge significant gaps in healthcare accessibility. Understanding patient satisfaction is critical to the success and expansion of these services. Patient satisfaction includes perceptions of care quality, communication effectiveness, convenience, and overall experience with the healthcare system (Gill & White, 2009). This study is particularly timely, given the recent surge in telemedicine adoption catalyzed by the COVID-19 pandemic. The pandemic has accelerated the integration of telemedicine into routine healthcare delivery, making it a necessity rather than a luxury.

This shift highlights the importance of evaluating telemedicine services from a patient-centered perspective to ensure these services are accessible and meet patient needs and expectations. In the Qassim Region, specific challenges to telemedicine include technological barriers such as limited internet connectivity and lack of access to advanced devices in remote areas. Additionally, digital literacy among patients varies, with some elderly patients finding it difficult to navigate telemedicine platforms. Cultural perceptions also play a role, as some patients still prefer face-to-face consultations, viewing them as more trustworthy and effective (Butzner & Cuffee, 2021). Conversely, the opportunities are vast, including increased access to specialized care, reduced travel times for patients, and the potential for enhanced chronic disease management. For example, telemedicine can provide continuous monitoring for patients with diabetes, allowing for timely interventions and better management of their condition.

Research Questions

How satisfied are patients with the telemedicine services provided in the Qassim Region, and what are the key challenges and opportunities associated with these services from the patients' perspective?

Objectives of the Study

1. The study aimed is to comprehensively assess patients' satisfaction with telemedicine services in the Qassim Region.
1- To measure and analyze the level of satisfaction among patients using telemedicine services in the Qassim Region, focusing on aspects such as service quality, ease of use, effectiveness of communication, and overall user experience.
2- To identify and critically examine the primary challenges and barriers faced by patients in accessing and utilizing telemedicine services. This includes exploring technological hurdles, digital literacy issues, infrastructural limitations, and cultural perceptions impacting the adoption of telemedicine.

Literature Review

The advent of eHealth has revolutionized the landscape of healthcare delivery, offering innovative solutions like telemedicine, which have become increasingly pertinent in the context of patient care and satisfaction. Telemedicine, a significant component of eHealth, refers to the use of telecommunications technology to provide clinical healthcare from a distance. Haleem *et al*. (2021) reported that unlike other eHealth services, telemedicine specifically facilitates real-time interactions between patients and healthcare providers, enabling immediate diagnosis and treatment (Kaur, Niazi, Thakur, Saeed, Rana, & Singh, 2022). It has been a game-changer in improving accessibility, cost-effectiveness, and quality of healthcare services. For instance, studies have shown that telemedicine reduces travel time for patients, lowers healthcare costs, and enhances the management of chronic diseases (Haleem, Javaid, Singh, & Suman, 2021). A growing body of literature attests to the critical role and benefits of telemedicine, especially

highlighted during the COVID-19 pandemic (Jarvinen, 2022).

During the COVID-19 period, telemedicine emerged not just as a convenience but as a necessity. The pandemic dramatically accelerated the adoption of telemedicine worldwide as a response to the healthcare challenges posed by the crisis. As physical distancing became crucial, telemedicine allowed continued access to healthcare while minimizing the risk of virus transmission. Studies have shown that telemedicine has been essential in ensuring uninterrupted healthcare services, managing chronic diseases, and providing mental health support during the pandemic (Kichloo, Albosta, Dettloff, Wani, El-Amir, Singh *et al*., 2020). It also played a crucial role in triaging COVID-19 symptoms and reducing the burden on healthcare facilities.

During the COVID-19 period, Mutair *et al*. (2023) found that telemedicine use across Saudi Arabia proved to be an effective and safe method for facilitating communication between patients and healthcare providers. However, to enhance its feasibility, there is a need for insurance companies and healthcare providers to increase awareness regarding the insurance coverage of these services (Mutair, Saha, Alhuqbani, Alhuqbani, AlQahtani, Abogosh, *et al*., 2023).

Patients' satisfaction with healthcare services is a multidimensional concept that includes aspects such as the quality of care, access to care, interpersonal aspects, and the physical environment. In the realm of telemedicine, patient satisfaction is influenced by factors like ease of use, quality of care, trust in technology, and the effectiveness of communication with healthcare providers. Research by Batbaatar *et al*. (2019) indicated that patients valued the convenience and time-saving aspects of telemedicine, along with the comfort of receiving care in their own homes (Batbaatar, Dorjdagva, Luvsannyam, Savino, & Amenta, 2017).

Specifically, within telemedicine services, several studies have highlighted high levels of patient satisfaction. A study by Nada (2018) revealed that patients appreciated the reduced need for travel, shorter waiting times, and the overall efficiency of telemedicine consultations. However, concerns were also noted about privacy, the impersonal nature of remote consultations, and technical issues. It's important to note that patient satisfaction with telemedicine can vary based on demographics, with younger, more tech-savvy patients generally reporting higher satisfaction levels (Nanda & Sharma, 2021). Saudi Arabia's transition to digital health aligns seamlessly with its Vision 2030, which emphasizes technological advancement in various sectors, including healthcare.

The Kingdom has made significant strides in incorporating digital health solutions to enhance the efficiency and quality of healthcare services. The Saudi Ministry of Health has implemented various eHealth initiatives, such as the "Seha" virtual hospital and the "Mawid" appointment system, demonstrating commitment to digital transformation in healthcare (Al-Kahtani, Alruwaie, Al-Zahrani, Abumadini, Aljaafary, Hariri, B., *et al*., 2022). This digital transition has been particularly crucial during the COVID-19 pandemic, where Saudi Arabia leveraged telemedicine to provide uninterrupted healthcare services. The integration of telemedicine into the national healthcare system not only aligns with Vision 2030's objectives of innovation and accessibility but also reflects a forward-thinking approach to healthcare delivery in the Kingdom (Alqutub, 2022).

Many studied discussed patients, satisfaction with the provided healthcare services via telemedicine and virtual clinks. Abdel Nasser, Mohammed Alzahrani, Al-falah, Muwafak Jreash, Talea Almouled, Salem Bakula *et al*. (2021) stated that approximately 52% of participants expressed high satisfaction with the registration process's simplicity, and 43.4% felt they could communicate freely during telemedicine sessions. Notably, we were very satisfied with the ease of registration, followed by the visual quality, with the audio quality, and with the freedom of communication in telemedicine. Furthermore, they reported high satisfaction regarding their understanding of the recommendations and the overall quality of care, while about one third of the participants were highly satisfied with their overall telemedicine consultation experience. The study also found a significant positive relationship between levels of satisfaction and attitude scores among respondents.

Another study showed that over half of the participants (52%) were highly content with the registration process's simplicity, felt comfortable communicating openly during telemedicine sessions (Alotaibi, Ghazi, Asraf, & Asmari,

2023). The study found that respondents were most satisfied with the ease of registration, followed by satisfaction with visual image quality at audio sound quality at and the freedom to converse easily during telemedicine. Additionally, respondents reported a high level of satisfaction with their understanding of the medical advice given and the overall quality of care received, while they were very satisfied with their entire telemedicine consultation experience. The study also indicated a notable positive link between the levels of satisfaction and the attitude scores of the respondents (Abdel Nasser, Mohammed Alzahrani, Al-falah, Muwafak Jreash, Talea Almouled, Salem Bakula, *et al.*, 2021).

Figure 1
Conceptual framework

Methods and Materials

This study utilized a quantitative research approach, focusing on collecting numerical data to objectively assess patients' satisfaction with telemedicine services in the Qassim Region. A cross-sectional survey design was employed. This design was appropriate for gathering data online at a specific point in time to analyze the current state of patient satisfaction with telemedicine services.

Study Setting and Sampling

The research was conducted in the Qassim Region, a significant area in Saudi Arabia known for its unique geographic and demographic characteristics, which influence healthcare delivery and access. The study population included all patients who have used telemedicine services in the Qassim Region within the last year. Based on the study population estimated to be 30000 patients, the sample size should be 380 participants. Due to time limitations, a sample size of approximately 352 patients took part, using a convenient sampling method. This method ensured representation from various subgroups within the population, such as different age groups, genders, and geographical locations within the Qassim Region.

Data Collection

A questionnaire was used (used in a previous study entitled " perceptions, satisfaction, and barriers to telemedicine use: a community-based study from Jeddah, Saudi Arabia") (Amjad Alfaleh, Abdullah Alkattan, Salah, M., Almutairi, M., Sagor, K., Alaa Alageel, *et al*., 2021). It consisted of closed-ended questions to evaluate various aspects of patient satisfaction, including service quality, accessibility, and communication efficiency. The questionnaire was distributed

online, utilizing platforms commonly accessed by the population in the Qassim Region. This approach was consistent with the telemedicine theme and ensures wider reach.

The questionnaire was pretested for validity and reliability and modified accordingly. The reliability of questionnaire was tested using Cronbach's alpha. Reliability of section A: demographic characteristics are good (alpha = 0.566), and Cronbach's alpha (alpha = 0.525) is good for section B: previous experience with telemedicine and its technologies. Also, the reliability of section C: perspectives toward telemedicine are very good (alpha = 0.839), the reliability of section E: satisfaction domains across the included population is very good (alpha = 0.933) and the reliability for all questionnaire is very good (alpha = 0.757), (Table 1).

Data Analysis

Collected data was analyzed using statistical software (SPSS) to summarize the data, while inferential statistics helped in generalizing and identifying significant patterns or relationships. Data was securely stored, with access limited to the research team, to maintain confidentiality and integrity.

Table 1

Reliability Coefficient of the Questionnaire

	Section	Question (N)	Alpha
1	Demographic Characteristics	6	0.566
2	Previous experience with telemedicine and its technologies	5	0.525
3	Perspectives toward telemedicine	15	0.839
4	Satisfaction Domains across the included population	8	0.933
	Total	34	0.757

Ethical Considerations

For conducting this research, all the necessary approvals were obtained. Ethical approval number (H-2024-119) was sought from a relevant institutional review board. Participants were informed about the study's purpose, their right to withdraw at any time, and assurance of their data's confidentiality. Informed consents were obtained from all participants. The study adhered to ethical guidelines, ensuring that no harm comes to the participants, and maintaining high standards of data privacy and security.

Results and Findings

Data was analyzed using SPSS version 28 to generate descriptive statistics and computed another measurement. Data was analyzed in terms of frequency percentages and non-parametric statistics like descriptive Statistics (frequencies) and Pearson correlation coefficient. After the questionnaire was circulated, 352 responses were obtained. In the examined sample for Section A, which focuses on demographic data, the distribution between male and female participants was 63.9% and 36.1%, respectively. The age breakdown revealed that 17.2% were aged 17-25 years, 57.6% were 26-35 years old, 14.2% fell into the 36–45-year range, 10.6% were between 46-55 years, and a minimal 0.3% were over 55 years. In terms of nationality, 92.1% were Saudi and 7.9% were non-Saudi.

Regarding employment status, the sample comprised 18.2% unemployed individuals, 27.2% working in the private sector, 48% in the governmental sector, and 6.6% students. When asked about the presence of chronic diseases such as diabetes or hypertension, 21.2% of respondents indicated they had none, while 78.8% confirmed having such conditions. Lastly, in terms of educational attainment, 74.8% had a College/University level education, 17.2% had completed high school, and 7.9% had attained a primary level of education (Table 2).

Table 2
Demographic Characteristics for the Participants

Parameters	Number	(%)
Age		
17-25 years	62	17.2
25-35 years	184	57.6
36-45 years	53	14.2
46-55 years	42	10.6
> 55 years	11	0.3
Total	352	100.0
Nationality		
Saudi	303	92.1
Non-Saudi	49	7.9
Total	352	100.0
Gender		
Male	218	63.9
Female	134	36.1
Total	352	100.0
Employment status		
Unemployed	67	18.2
Private sector	95	27.2
Governmental sector	157	48.0
Student	33	6.6
Retired	0	0.00
Total	352	100.0
Education level		
College/University	243	74.8
High school	69	17.2
Intermediate	0	0.00
Primary	0	0.00
Postgraduate	40	7.9
Illiterate	0	0.00
Total	352	100.0
Do you have any chronic diseases? e.g., Diabetic/Hypertension		
No	89	21.2
Yes	263	78.8
Total	352	100.0

The analysis of Section B in Table 3, focusing on prior experiences with telemedicine and related technologies, reveals noteworthy trends. Post the emergence of COVID-19, a substantial 50.34% of participants began using telemedicine, indicating its accelerated adoption during the pandemic. The primary application of telemedicine was for medical consultations, as reported by 36.63% of respondents, underscoring its role in addressing routine healthcare needs.

Telemedicine interaction was predominantly conducted via phones or video calls (40.72%), highlighting the significance of these accessible technologies in healthcare delivery. Additionally, mobile health or mHealth emerged as the most recognized (31.90%) and preferred (44.63%) form of telemedicine. This preference and awareness reflect the convenience and accessibility of mHealth, suggesting its pivotal role in the evolving landscape of telemedicine, especially in a post-pandemic context.

Table 3
Previous Experience with Telemedicine and its Technologies

Questions	Answer	N	(%)
Q1	When was the first time you used telemedicine?		
	I haven't used it at all	141	41.05
	Before the emergence of COVID-19	42	8.81
	After the emergence of COVID-19	169	50.34
	Total	302	100.0
Q2	If yes, please choose the reasons for using telemedicine		
	Emergency	73	17.02
	Lockdown	23	5.36
	Drug adverse events	39	9.09
	Exacerbated chronic condition	20	4.66
	Medical consultation	170	36.63
	Follow-up	95	22.14
	Others	9	5.1
	Total	429	100.0
Q3	I use these devices regularly		
	Phone or video calls	180	40.72
	Live video conferences	41	9.28
	Laptops	62	14.03
	Personal computers	54	12.22
	Some of these devices	59	13.35
	None of these devices	46	10.40
	Total	442	100.0
Q4	Which type of telemedicine do you know?		
	Live video conferencing	79	17.87
	Store-and-forward synchronous video	46	10.41
	Remote patient monitoring	91	20.59
	Mobile health or mHealth	141	31.90
	I do not know any of them	85	19.23
	Total	442	100.0
Q5	Which type of telemedicine service do you prefer?		
	Live video conferencing	46	12.99
	Store-and-forward synchronous video	21	5.93
	Remote patient monitoring	56	15.82
	Mobile health or mHealth	158	44.63
	I do not know any of them	73	20.63
	Total	354	100.0

Table 4 provides insights into the prevailing attitudes towards telemedicine. A substantial consensus exists on the time-saving benefits of telemedicine, evidenced by 44.4% of respondents strongly agreeing and 38.1% agreeing. Furthermore, a notable segment of the sample (47.4% agree, 34.8% strongly agree) views telemedicine as an essential component of patient care. Additionally, the necessity of telemedicine in rural and healthcare-limited areas is strongly endorsed, with 47.0% strongly in agreement and 36.8% in agreement.

These findings collectively highlight the perceived importance and effectiveness of telemedicine in various aspects of healthcare delivery.

Table 4

Perspectives towards Telemedicine

Questions		Answer	N	(%)
Q1	Do you think that telemedicine will save time?			
		Strongly disagree	16	2.0
		Disagree	16	2.0
		Neutral	51	13.6
		Agree	125	38.1
		Strongly Agree	144	44.4
Q2	Do you think that telemedicine is necessary for patient care?			
		Strongly disagree	12	.7
		Disagree	20	3.3
		Neutral	52	13.9
		Agree	153	47.4
		Strongly Agree	115	34.8
Q3	Do you think that telemedicine is necessary for rural areas and areas that suffer from a shortage of healthcare services?			
		Strongly disagree	0	0.0
		Disagree	25	4.3
		Neutral	49	11.9
		Agree	123	36.8
		Strongly Agree	155	47.0
Q4	Do you think that telemedicine will save effort?			
		Strongly disagree	19	3.0
		Disagree	21	3.6
		Neutral	37	8.9
		Agree	152	47.0
		Strongly Agree	123	37.4
Q5	Do you think that telemedicine will save money?			
		Strongly disagree	0	0.0
		Disagree	27	5.0
		Neutral	76	20.9
		Agree	132	39.7
		Strongly Agree	117	34.5
Q6	Do you think that telemedicine will decrease transportation costs?			
		Strongly disagree	13	1.0
		Disagree	18	2.6
		Neutral	33	7.6
		Agree	152	47.0
		Strongly Agree	136	41.7
Q7	Do you think that telemedicine will decrease medical mistakes?			

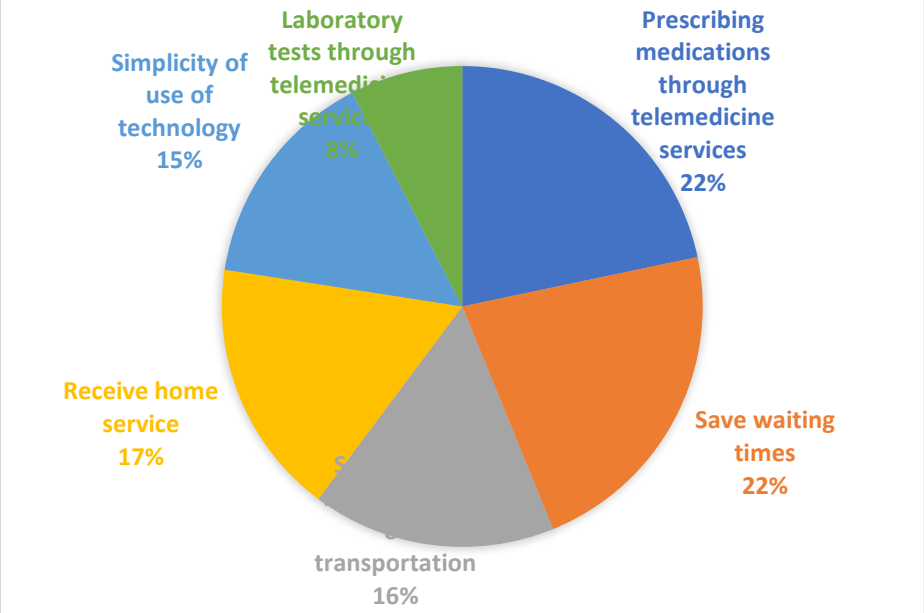
		Strongly disagree	21	3.6
		Disagree	36	8.6
		Neutral	155	48.0
		Agree	94	27.8
		Strongly Agree	46	11.9
Q8	Do you think that telemedicine will decrease waiting lists at medical centers?			
		Strongly disagree	0	0.0
		Disagree	25	4.3
		Neutral	42	9.6
		Agree	135	40.7
		Strongly Agree	150	45.4
Q9	Do you think that telemedicine will improve the doctor-patient relationship?			
		Strongly disagree	16	2.0
		Disagree	24	4.6
		Neutral	85	24.8
		Agree	148	45.7
		Strongly Agree	79	22.8
Q10	Do you think that telemedicine can help in giving the patient appropriate instructions in emergency situations?			
		Strongly disagree	18	2.6
		Disagree	19	3.0
		Neutral	65	18.2
		Agree	141	43.4
		Strongly Agree	109	32.8
Q11	Do you think that telemedicine can put the patient's privacy at risk?			
		Strongly disagree	48	12.6
		Disagree	87	25.5
		Neutral	121	36.8
		Agree	64	17.9
		Strongly Agree	32	7.3
Q12	Do you think that telemedicine may lead to the disclosure of patients' medical information to unauthorized persons?			
		Strongly disagree	47	12.3
		Disagree	108	32.5
		Neutral	95	28.1
		Agree	75	21.5
		Strongly Agree	27	5.6
Q13	Do you think that telemedicine is suitable for all medical conditions?			
		Strongly disagree	51	13.6
		Disagree	74	21.2
		Neutral	76	28.5
		Agree	94	27.8
		Strongly Agree	37	8.9
Q14	Do you think telehealth services have made receiving healthcare easier today?			
		Strongly disagree	15	1.7
		Disagree	12	.7
		Neutral	46	11.9
		Agree	188	58.9
		Strongly Agree	91	26.8
Q15	Do you think the presence of the camera and other equipment can embarrass you or make you feel uncomfortable?			
		Strongly disagree	15	1.7

	Disagree	63	17.5
	Neutral	129	39.4
	Agree	86	25.2
	Strongly Agree	59	16.2

Figure 2 shows the factors enhancing the telemedicine experience as follows: The most significant aspect, valued by 22.13% of respondents, is the potential of telemedicine to save waiting times, indicating a high appreciation for its efficiency in reducing delays in healthcare service delivery. Closely following, with 21.70% agreement, is the ability to prescribe medications through telemedicine services, underscoring the importance of remote prescription management. The convenience of receiving healthcare services at home is another key enhancer, acknowledged by 17.23% of respondents, highlighting the value placed on comfort and accessibility. Addressing the financial cost of transportation is considered vital by 16.38% of the participants, reflecting the advantage of telemedicine in reducing travel-related expenses. The simplicity of using telemedicine technology, endorsed by 15% of users, suggests that an easy-to-navigate and user-friendly interface significantly improves the telemedicine experience. Lastly, the ability to conduct laboratory tests through telemedicine services, although the least agreed-upon factor with 7.51%, indicates its emerging role in enhancing comprehensive healthcare delivery remotely.

Figure 2

Factors that may Enhance the Experience of Telemedicine



In Figure 3, the responses regarding satisfaction levels among the population in the Qassim Region of Saudi Arabia are summarized, showing an average rating of 4.0364 and a standard deviation of 0.64436. The data reveals a diverse range of satisfaction levels: a minimal 0.67% of participants expressed being 'Very dissatisfied', while 1.53% indicated they were 'Dissatisfied'. A significant portion, 21.77%, chose a neutral position. The majority, 46.23%, felt 'Satisfied' with their experience. Notably, a considerable 29.80% of the participants reported being 'Very satisfied'. This distribution of responses provides a detailed insight into the various degrees of contentment among the surveyed individuals.

Based on the highest levels of satisfaction (sum of "Satisfied" and "Very Satisfied"), the findings are as follows: The overall quality of care provided received total satisfaction of 81.8% (46.7% Satisfied + 35.1% Very Satisfied). The ability to talk freely over telemedicine achieved a combined satisfaction level of 80.8% (52.0% Satisfied + 28.8% Very Satisfied). The overall telemedicine result garnered a total satisfaction of 80.7% (43.0% Satisfied + 37.7% Very Satisfied). The ease of registration and rescheduling processes reached a combined satisfaction of 78.9% (47.4% Satisfied + 31.5% Very Satisfied). Finally, the ability to understand the recommendations or diagnosis made resulted in total satisfaction of 74.2% (45.4% Satisfied + 28.8% Very Satisfied).

Figure 3

Satisfaction Domains across the included Population

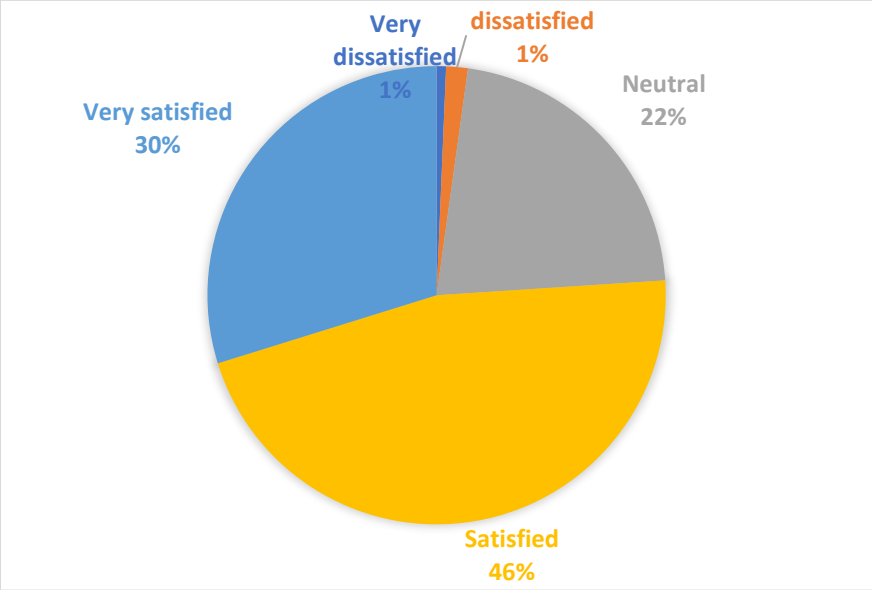


Table 5 utilizes the Pearson correlation coefficient to examine the relationship between demographic factors and elements that could improve the telemedicine experience, as well as satisfaction levels among the surveyed population. It was found that the correlation between age, gender, employment status, and the presence of chronic diseases (such as diabetes or hypertension) and factors enhancing telemedicine experience is not statistically significant, as indicated by P values greater than 0.05 and 0.01. However, a significant correlation exists between nationality and the initial usage of telemedicine and the factors enhancing telemedicine experience, as shown by P values less than 0.05 and 0.01. Additionally, the Pearson correlation coefficient shows a significant relationship between satisfaction levels and the variables of chronic disease presence and initial telemedicine usage, with P values less than 0.05 and 0.01, while other demographic information does not show a significant correlation, as their P values are greater than 0.05 and 0.01.

Table 5

Associations between demographics and (Factors and satisfaction

Demographic Information	Factors that may enhance the experience of telemedicine	Satisfaction Domains across the included population
Age (years)	0.039 (0.504)	-0.102 (0.076)

Gender	-0.068 (0.242)	-0.001 (0.686)
Nationality	-0.114* (0.047)	-0.024 (0.681)
Employment status	0.070 (0.224)	-0.015 (0.797)
Education level	-0.148** (0.010)	-0.005 (0.934)
Do you have any chronic diseases? e.g., diabetic/hypertension	0.017 (0.767)	-0.141* (0.014)
When was the first time you used telemedicine?	-0.124* (0.031)	-0.146* (0.011)

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Summary of Major Findings

Post-COVID-19, 50.34% of participants started using telemedicine, indicating its rapid adoption during the pandemic. The primary use was for medical consultations (36.63%), highlighting their role in routine healthcare, with interactions mainly via phones or video calls (40.72%). Mobile health (mHealth) emerged as the most recognized (31.90%) and preferred (44.63%) form of telemedicine due to its convenience and accessibility. Attitudes towards telemedicine were positive, with 82.5% viewing it as a time-saver, 82.2% seeing it as essential for patient care, and 83.8% considering it necessary for rural and underserved areas. The most valued aspect of telemedicine was saving waiting times (22.13%), followed by remote medication prescriptions (21.70%), receiving healthcare services at home (17.23%), and addressing transportation costs (16.38%). The least influential factor was conducting laboratory tests through telemedicine (7.51%). Satisfaction levels in the Qassim region were high, with most participants feeling 'Satisfied' (46.23%) or 'Very satisfied' (29.80%). The highest satisfaction was in 'Overall Quality of Care Provided' (81.8%), followed by the 'Ability to Talk Freely Over Telemedicine' (80.8%), 'Overall Telemedicine Consult' (80.7%), 'Ease of Registration/Reschedule' (78.9%), and 'Ability to Understand Recommendations or Diagnosis' (74.2%). Pearson correlation analysis revealed no significant correlation between demographic factors like age, gender, and employment status with the enhancement of telemedicine experience. However, nationality and initial usage of telemedicine showed a significant correlation with the enhancement of telemedicine experience, as did satisfaction levels with chronic disease presence and initial telemedicine usage.

Discussion

The accelerated adoption of telemedicine following the COVID-19 pandemic has brought about a significant transformation in the healthcare industry, marking the beginning of a new era in patient care. This shift is not only supported by anecdotal evidence but is also backed by numerous studies conducted worldwide. By analyzing past experiences, attitudes towards telemedicine, factors that enhance the telemedicine experience, and satisfaction levels among patients and healthcare providers, it becomes clear that telemedicine has become an integral part of modern healthcare delivery. The convenience, accessibility, and efficiency offered by telemedicine have made it a preferred choice for many individuals seeking medical advice and treatment. As we continue to navigate through the challenges posed by the pandemic, it is evident that telemedicine will play a crucial role in shaping the future of healthcare delivery. Its widespread acceptance and positive outcomes observed in various studies highlight its potential to

revolutionize the way healthcare services are accessed and delivered. The era of telemedicine is here to stay, bringing with it a host of benefits for both patients and healthcare providers alike.

Prior Experiences with Telemedicine

The study revealed that the surge in telemedicine usage post-COVID-19, with half of the participants starting to use these services, aligns with global trends. This finding aligns with research conducted by Scheffer et al. revealed that there was a significant surge in the utilization of remote telehealth services within the healthcare industry during the COVID-19 pandemic. This increase was primarily driven by the need to maintain essential communication between healthcare providers and patients, particularly for those in remote locations. The study highlighted that telehealth became a critical tool in ensuring the continuity of basic healthcare services when traditional face-to-face interactions were limited due to pandemic-related restrictions (Albaghdadi & Daajani, 2023).

The study showed that telemedicine's primary use for medical consultations (36.63%). Research conducted by Haleem et al. revealed that telemedicine has significantly enhanced the availability of superior healthcare services. This advancement allows patients to receive more tailored clinical services. Utilizing video application software, patients can easily connect with top healthcare professionals for consultations from remote locations. Moreover, this technology equips clinicians with more effective tools for communication, data management, report handling, and the ability to capitalize on each other's unique expertise. This progression in telemedicine has led to a more efficient and patient-centric approach in healthcare delivery (Jarvinen, 2022). The preference for phones or video calls and the prominence of mobile health (mHealth) align with findings from a study by Stoumpos *et al*., emphasizing the growing reliance on accessible and user-friendly technology in healthcare (Scheffer, Cassenot,e., de Britto e Alves, & Russo, 2022).

Attitudes towards Telemedicine

The perception of telemedicine as a time-saver was very high. Healthcare professionals acknowledged that telemedicine appointments were typically briefer than in-person visits. Not only are these virtual consultations more time-efficient, but they also eliminate the need for patients to physically travel to the hospital or clinic physically, providing added convenience and reducing potential exposure to illnesses (Stoumpos, Kitsios, & Talias, 2023). Its essential role in patient cares the majority agree or strongly agree) and necessity in rural areas are supported by this research.

A narrative review study emphasized the extent of telehealth interventions' usage in rural communities throughout the United States. These telehealth approaches showed beneficial results for both patients and healthcare professionals, indicating their effectiveness in ongoing education and training within the workplace. However, the scope of this study's findings is confined to rural areas within the country and focus primarily on certain therapeutic disease areas (Sahin, Kefeli, Cabuk, Ozden, Cakmak, Kaypak, *et al*., 2021).

Factors Enhancing Telemedicine Experience

The high value placed on saving waiting. Haleem et al.'s study highlighted that telemedicine facilitates private healthcare professionals in their practice, significantly improving patient experience. With telemedicine, patients avoid lengthy wait times in queues, while physicians gain easier and more efficient access to patient records through electronic files, thus reducing overall waiting periods. Additionally, virtual consultations enable doctors to spend less time per patient, which allows them to attend to a larger patient base (Al-Kahtani, Alruwaie, Al-Zahrani, Abumadini, Aljaafary, Hariri, *et al*., 2022).

Satisfaction Levels in the Qassim Region

The diverse satisfaction levels, with most respondents demonstrated satisfaction is consistent with findings from a study conducted by Kaur et al., which revealed that most of the participants expressed satisfaction with the quality of

telemedicine services provided to them (Mutair, Saha, Alhuqbani, Alhuqbani, AlQahtani, Abogosh, *et al*., 2023). A study by Alotaibi et al. indicated that patients receiving care at primary healthcare centers in the King Abdulaziz Medical City-Jeddah region in Saudi Arabia generally expressed satisfaction and a positive outlook towards telemedicine consultations during the COVID-19 pandemic. Nonetheless, challenges such as inadequate internet connectivity, limited awareness and comprehension of telehealth services, and concerns regarding camera use were identified as obstacles to the full utilization of these services.

Satisfaction Factors

The highest satisfaction was seen in 'overall quality of care provided', followed by the 'ability to talk freely over telemedicine', 'overall telemedicine consultation', 'ease of registration/ reschedule', and 'ability to understand recommendations or diagnosis'. Telemedicine facilitates patients by enabling them to view the available time slots of doctors, as well as their upcoming appointments, and offers the convenience of rescheduling them as needed.

Conclusions

The study on telemedicine provides valuable insights into its adoption and perception, particularly in the wake of the COVID-19 pandemic. Overall, this study contributes to a growing body of evidence supporting the integration of telemedicine into the healthcare system. It highlights the need for ongoing investment in infrastructure, technology, and patient education to realize the potential of telemedicine fully. As healthcare continues to evolve in the digital age, telemedicine stands out as a key component in enhancing healthcare delivery, improving patient outcomes, and bridging gaps in healthcare accessibility. The lessons learned from this study provide a roadmap for healthcare providers, policymakers, and researchers to refine further and leverage telemedicine for the benefit of patients and the healthcare system at large scale.

Recommendations

Based on the study's findings, several recommendations can be made to further improve and optimize telemedicine services. Firstly, enhancing accessibility and user-friendliness is crucial. Given the rapid adoption of telemedicine post-COVID-19 and the preference for mobile health (mHealth), telemedicine platforms should continue simplifying app interfaces, ensuring compatibility with a wide range of devices, and providing user support for patients unfamiliar with the technology.

Secondly, focusing on routine healthcare services is essential, as many telemedicine interactions are used for routine consultations. Expanding and streamlining these services, including offering a broad range of consultation types and training healthcare professionals in virtual care delivery, is recommended.

Thirdly, significant investments should be made in infrastructure for rural and underserved areas, such as reliable internet connectivity and training local healthcare workers in telemedicine, considering the high value placed on these areas. Additionally, optimizing telemedicine for efficiency involves reducing waiting times, facilitating quick prescription services, and improving the scheduling and rescheduling process for appointments. Expanding services beyond consultations to include remote monitoring, especially for patients with chronic diseases, and integrating laboratory services into telemedicine platforms can also enhance care quality. Furthermore, focusing on patient education and awareness is vital to address barriers related to the lack of awareness and understanding of telehealth offerings. Tailoring telemedicine services based on demographic needs, such as designing age-appropriate interfaces or providing language translation services, can make telemedicine more inclusive.

Finally, continuous quality improvement should be a priority, maintaining high satisfaction rates in the overall quality of care through ongoing training for healthcare providers in virtual care delivery and regular updates to telemedicine platforms based on user feedback.

Study Strengths and Limitations

The study boasts several strengths that enhance its reliability and relevance. Firstly, the inclusion of a large and diverse group of participants post-COVID-19 improves the reliability and generalizability of the findings. Secondly, its comprehensive scope covers various aspects of telemedicine, such as prior experiences, attitudes, and satisfaction levels, providing a holistic understanding of its impact. Conducted during a crucial period post-COVID-19, the study captures the essential shift in telemedicine usage and perception, adding to its timeliness and relevance. Additionally, the use of established statistical methods, like the Pearson correlation coefficient, lends robustness to the findings. The patient-centered approach, emphasizing patient satisfaction and experience, aligns with the current focus on patient-centered healthcare. Furthermore, addressing technological aspects of telemedicine, such as mHealth, reflects the study's alignment with contemporary healthcare trends. Finally, by focusing on specific regions like the Qassim Region in Saudi Arabia, the study offers valuable insights into cultural and regional impacts on telemedicine.

The study has several limitations. Firstly, its limited scope in disease and treatment types may have focused on specific therapeutic areas, potentially limiting its applicability to a broader range of medical conditions and treatments. Secondly, there is potential bias in participant selection, as the selection process might not fully represent the entire population, leading to potential biases in the results. While providing valuable regional insights, the concentration on specific areas like the Qassim Region might limit the generalizability of the findings to other regions or cultural contexts. Additionally, the short-term analysis primarily captures the immediate effects post-COVID-19 and may not reflect long-term trends or evolving perspectives on telemedicine. The lack of comparative analysis between telemedicine and traditional in-person care means the study may miss out on understanding the relative benefits and drawbacks of each mode. Furthermore, the study might not fully address operational challenges in implementing telemedicine, such as infrastructure requirements and healthcare provider training. Finally, given the digital nature of telemedicine, the study might not thoroughly explore critical aspects of data privacy and security.

Declarations

Ethical Approval and Consent to Participate: This study strictly adhered to the Declaration of Helsinki and relevant national and institutional ethical guidelines. Informed consent was not required, as secondary data available on websites was obtained for analysis. All procedures performed in this study were by the ethical standards of the Helsinki Declaration. The ethical approval number (H-2024-119) was received from IRB of University of Hail, Hail City, Saudi Arabia.

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