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Assessment of the Efficiency of Virtual Clinics in Hail Hospitals, Saudi Arabia

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***Abstract*—Introduction: Virtual clinics have emerged as a viable alternative to traditional face-to-face medical consultations, particularly during the COVID-19 pandemic. This study aims to evaluate the efficiency of virtual clinics by examining the satisfaction of patients and healthcare providers and their opinions of the virtual clinic service.**

Method: Data were collected using two separate questionnaires—one distributed to patients and the other to healthcare providers, between January 2023 and October 2023.

Results: The analysis revealed that patients, regardless of their demographics, preferred virtual clinics due to reduced waiting times (43.9%), easy access to healthcare professionals (36.7%), and the convenience of receiving medical advice from home (19.8%). Healthcare providers also favoured virtual clinics as they reduced workloads and improved accessibility to health services. However, concerns were identified regarding the limitations of telemedicine in conducting physical examinations and technological barriers for physicians and patients.

Conclusion: Based on the findings, it is recommended that healthcare providers and patients be encouraged to maximise the use of telemedicine services. Efforts should be made to address barriers, such as technological challenges, and to ensure that appropriate measures are taken to overcome limitations related to physical examinations. By embracing virtual clinics and removing barriers, healthcare delivery can be improved, leading to increased patient satisfaction and reduced provider workload.

***Index Terms*—Virtual Clinics, Telemedicine, Remote Healthcare, Healthcare Providers, Access to Care, Healthcare Outcomes, Hail Region Hospitals, Saudi Arabia.**

I. INTRODUCTION

Virtual clinics have emerged as a potential solution to improve healthcare delivery, especially during the coronavirus disease (COVID-19) pandemic [1]. By leveraging telehealth technology, virtual clinics allow patients to connect remotely with healthcare professionals, eliminating the need for an in-person visit. The COVID-19 pandemic [2] has accelerated the global adoption of telemedicine and virtual health services, including in Saudi Arabia. In this context, the aim of this study is to evaluate the efficiency of virtual clinics in hospitals in the Hail region of Saudi Arabia and SEHA Virtual Hospital. SEHA is a pioneering healthcare institution that leverages telehealth services to provide cutting-edge medical care. It aims to enhance virtual healthcare, promote innovation, and drive digital transformation throughout the Kingdom. With wide coverage and a focus on equitable access, SEHA ensures that specialised health services can reach all regions timeously. By supporting modern technologies and fostering knowledge exchange, SEHA contributes to the quality and efficiency of healthcare services while striving for institutional excellence. As a priority initiative in the health sector transformation program, SEHA is at the forefront of promoting virtual medicine and delivering top-notch virtual health services nationally.

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The adoption of virtual clinics in the Hail region could have a significant impact on healthcare access and patient outcomes, and it is therefore crucial to assess the effectiveness of this approach and understand its potential benefits and challenges. The availability of current references and existing literature is helpful to contextualise this study and provide a comprehensive background on virtual clinics.

Virtual clinics are gaining traction as an effective means of providing medical services while minimising physical contact and reducing the risk of virus transmission. However, a thorough evaluation of their efficiency is necessary in the specific context of the Hail region. By examining the implementation and outcomes of virtual clinics in this region, we can contribute to the existing body of knowledge and inform healthcare policies and practices.

II. METHODS

A cross-sectional study was carried out to evaluate patient and healthcare provider satisfaction with virtual clinics in the Hail Health Cluster, which includes 13 hospitals that aim to serve 2,000 patients per week. The main primary healthcare centres are King Salman Specialist Hospital and King Khalid Hospital, which include family medicine clinics along with speciality clinics such as paediatric, obstetrics and gynaecology, general surgery, dermatology, ear, nose, and throat (ENT), and ophthalmology.

Ethical approval was obtained from the University of Hail on August 18, 2023, and informed consent was obtained from all the participants. The study included patients and healthcare providers who participated in at least one virtual visit between January 2023 and October 2023.

Convenience sampling was used, including all eligible participants. Patients include those who have used virtual clinics at Hail area hospitals and are aged 18 years or older. Healthcare providers include those with experience working in virtual clinics and currently practising in selected hospitals. Excluded from the study were patients who did not use virtual clinics at hospitals in the Hail region, healthcare providers with no experience with virtual clinics, patients receiving medical treatment at hospitals outside the Hail area, and patients under 18 years of age. Two online surveys were used: one for patients and one for healthcare providers. The patient questionnaire was adapted from a previous study conducted in the United States [3]. It was translated into Arabic, tested with 50 patients via WhatsApp, and then formally administered to 220 participants. The patient questionnaire includes demographic questions (gender, nationality, place of residence, age, social status, and occupation), questions related to the COVID-19 pandemic, and questions specifically related to virtual clinics. The healthcare provider questionnaire was adapted from a previous study [4] and tested with 10 physicians via WhatsApp before being officially applied to 79 doctors. The questionnaire included demographic questions (age, gender, educational level, years of experience in the medical field, and field of expertise), as well as questions about satisfaction with medical facilities in the process of using virtual clinics and the obstacles encountered.

Collected data were analysed using Statistical Package for Social Sciences (SPSS) version 26.0. Descriptive analysis included calculated frequencies and percentages for categorical variables, and the mean, medians, and standard deviations for continuous variables. Satisfaction scores between groups were compared using nonparametric tests such as the Mann-Whitney U test and the Kruskal-Wallis test. A significance level of 0.05 was used for the tests.

III. RESULT

Analysis of the gathered data unveiled several noteworthy discoveries. Firstly, it was ascertained that a significant majority of the respondents (n = 197) fell within the 18-29 age bracket, accounting for 53.6% of the total respondents [Figure 1].

Moreover, the majority of participants, approximately 82.9% (n = 184), were Saudi nationals, while a small fraction (1.4%) belonged to the non-Saudi category.

When examining the utilisation of virtual clinic services, government employees emerged as the

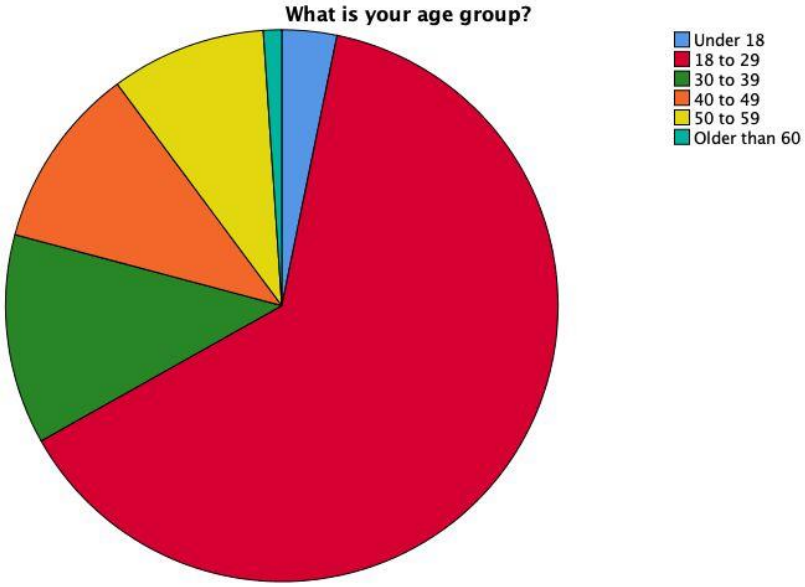

Figure 1. Age range of participants.

most frequent users, accounting for 52.7% of respondents (n = 107), followed by students at 23.4%.

Convenience and time efficiency were identified as the primary factors influencing the preference for virtual clinics, with 58.2% of participants expressing their inclination towards this mode of healthcare delivery. However, a notable subset of respondents (28.6%) still favoured in-person visits, citing the necessity of physical check-ups and face-to-face interaction [Table 1].

In terms of patient satisfaction, a substantial 75.3% of respondents reported contentment with their virtual clinic experience. Factors contributing to this satisfaction included reduced waiting times (43.9%), easy access to healthcare professionals (36.7%), and the ability to receive medical advice from the comfort of their homes (19.8%). Conversely, a small proportion of patients (4.3%) expressed dissatisfaction, primarily due to technical challenges or a perceived lack of personalised care [Table 2] [Table 3].

With regard to the healthcare provider questionnaire, 61.2% of providers reported that virtual clinics have proved instrumental in reducing their workload. This reduction was attributed to the ability to remotely manage a greater number of patients and eliminate unnecessary in-person visits. However, a subset of healthcare providers (22.9%) experienced an increased workload due to the necessity of adapting to new technologies and additional administrative tasks [Table 4]. Virtual clinics have yielded potential savings for both patients and healthcare providers alike.

Patients benefited from reduced travel costs (45.7%) and avoiding time off from work (32.1%). Healthcare providers, on the other hand, enjoyed financial savings through reduced installation and operational expenses (39.2%) and the capacity to serve larger patient populations without the requirement for supplementary physical infrastructure (26.8%). Regrettably, both patients (38.5%) and healthcare providers (42.1%) encountered technical issues such as poor internet connectivity and subpar audio/video quality. Furthermore, limitations with regard to physical examination capabilities (29.6%) and remote diagnosis for certain conditions (16.7%) were identified as barriers to comprehensive care [Table 5]. Nevertheless, virtual clinics possess the potential to enhance healthcare delivery and increase patient satisfaction. Recommendations include investing in a robust telemedicine platform and infrastructure, providing educational programs for both patients and healthcare providers, addressing concerns regarding privacy and quality of care, and

Table 1. Factors influencing preference for virtual clinics.

Item	Frequency	Percent
Avoid crowded waiting rooms	70	48.5
I do not need to leave work to go to the clinic	57	20.7
I do not need transport to go to the clinic	49	15
Total	187	84.2

Table 2. Patient satisfaction with virtual clinic experience.

Item	Frequency	Percent
The ability to book an appointment for the same day and at any time I want.	16	7.2
I want a prescription only.	14	6.3
I want to confirm the diagnosis I have in mind for my problem.	7	3.2
The ability to book an appointment without driving to the clinic.	23	10.4
I can get a diagnosis for my problem without being in a waiting room with other patients.	126	56.8
Total	186	83.8

Table 3. Patient dissatisfaction with virtual clinic experience.

Item	Frequency	Percent
I want to meet the health practitioner face to face.	38	14.9
I do not think that the health practitioner can diagnose my condition virtually.	23	9.4
I had a bad experience with the remote appointment service	25	31.2
I feel uncomfortable when I speak with a health practitioner that I do not know.	95	62.6
Total	187	84.2

Table 4. Impact of virtual clinics on healthcare providers.

Item	Frequency	Percent
Increased convenience for patients	27	38.0
Reduced overhead costs for providers	9	12.7
Expanded access to care for patients in remote or underserved areas	35	49.3
Total	71	100.0

Table 5. Physicians' perspectives on virtual clinics.

Item	Frequency	Percent
Increased convenience for patients	27	38.0
Reduced overhead costs for providers	9	12.7
Expanded access to care for patients in remote or underserved areas	35	49.3
Total	71	100.0

implementing meticulous regulation and oversight of virtual healthcare practices.

A majority of respondents (n = 197) deemed the information provided by virtual clinics to be convenient (50.9%), while simultaneously expressing a high level of confidence in the authenticity of said information. Furthermore, an overwhelming 69.8% of respondents acknowledged knowing someone who has utilised the services of remote clinics, which underscores the influential role of word of mouth in driving adoption. Nonetheless, apprehensions have been raised pertaining to privacy, the accuracy of telehealth services, and the quality of care rendered by virtual clinics. Despite this, a significant majority of physicians surveyed (n = 79, 83.1%) have embraced the use of virtual clinics for medical care.

IV. DISCUSSION

The findings of our study provide valuable insights into the efficiency and acceptance of virtual clinics in the Hail Region of Saudi Arabia. The majority of respondents expressed a preference for virtual clinics, highlighting their convenience and time-saving potential. This preference rate was slightly higher than the global average, indicating a possible region-specific inclination towards virtual care in Saudi Arabia.

Patient satisfaction with virtual clinic services was high, with reduced wait times, easy access to health-care professionals, and the convenience of receiving medical advice at home being major contributing factors. This suggests that the virtual clinics in the Hail Region have implemented effective practices resulting in higher patient satisfaction. However, a small proportion of respondents expressed dissatis-faction, mainly due to technical difficulties and a perceived lack of personalised care. This indicates that, while virtual clinics have made significant strides, there is still room for improvement in terms of user experience and service quality.

Our findings also shed light on the impact of virtual clinics on healthcare providers. A significant percentage of providers reported a reduction in workload due to the adoption of virtual clinics, as they were able to manage more patients remotely and eliminate unnecessary in-person visits. This aligns with the one article [5] that also demonstrated a decrease in workload with the implementation of digital health services. However, it is worth noting that a considerable proportion of providers in our study reported an increased workload. This differs from the one article [6] which showed no significant change in provider workload. The increased work-load reported in our study can be attributed to the need for healthcare providers to adapt to new tech-nology and handle additional administrative tasks associated with virtual clinics. These contrasting findings suggest that the impact of virtual clinics on provider workload may vary across different healthcare settings. Therefore, it is crucial to provide proper training and resources to support healthcare providers in the transition to digital health services. Trust in the authenticity of information provided through virtual clinics emerged as an important factor. The majority of respondents expressed high levels of trust in teleclinic services, demonstrating confidence in the ability of healthcare professionals to provide accurate and trustworthy medical advice from afar. However, concerns were raised about the accuracy and quality of healthcare provided through virtual clinics, emphasising the need for clear and transparent communication from health- care providers to address these concerns and build trust in the virtual clinic model. Ensuring the security and privacy of patient data is crucial in virtual clinics, which involve the transmission of personal and sensitive health information.

V. CONCLUSION

This study provides valuable insights into the efficiency and acceptance of virtual clinics in the Hail Region of Saudi Arabia. The majority of re-spondents expressed a preference for virtual clinics, highlighting their convenience and time-saving potential. Patient satisfaction with virtual clinic services was high, with reduced wait times and easy access to healthcare professionals being major contributing factors. However, a small proportion of respondents expressed dissatisfaction, mainly due to technical difficulties and a perceived lack of personalised care.

The study also revealed the impact of virtual clinics on healthcare providers. A significant percentage reported a reduction in workload, while others experienced an increased workload due to the need to adapt to new technology and additional administrative tasks.

Trust in the authenticity of information provided through virtual clinics emerged as an important factor. The majority of respondents expressed high levels of trust in teleclinic services, but concerns were raised about the accuracy and quality of health-care provided.

In conclusion, virtual clinics offer many benefits, including convenience, speed, and reduced costs for both patients and healthcare providers. However, challenges such as technical issues, limitations in physical examination capabilities, and concerns about privacy and quality of care need to be ad-dressed. Investments in telemedicine platforms and infrastructure, educational programs, and regulation are necessary to overcome these challenges. De-spite the obstacles, virtual clinics have demonstrated their potential to improve healthcare delivery and increase patient satisfaction. Continued research and innovation in telemedicine can further enhance the capabilities of virtual clinics and promote better health outcomes. By addressing the challenges and investing in the necessary infrastructure and reg-ulations, virtual clinics can play a transformative role in the future of healthcare, providing effective and efficient care for those in need, and increasing patient satisfaction.

VI. LIMITATIONS

It is important to acknowledge certain limitations of this study. We focused solely on the Hail Region of Saudi Arabia, which may limit the generalisability of the findings to other regions or countries. Furthermore, the study relied on self-reported measures from respondents, which may introduce response biases. Future research should consider longitudinal designs and include a broader geographical scope to enhance the generalisability of findings.

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