

ORIGINAL RESEARCH

Assessing the Impact of Virtual Clinics on Emergency Department and Primary Healthcare Visits in Saudi Arabia: A Cross-Sectional Study of 10,000 Patients

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Abstract: **Introduction:** By reducing the need for certain in-demand services, the virtual clinics could increase overall healthcare accessibility and operational effectiveness. This study aimed to examine the effect of establishing these clinics on the frequency of emergency department (ED) and primary healthcare (PHC) visits across Saudi Arabia. **Methods:** A nationwide cross-sectional survey was carried out on 10,000 patients who had used virtual clinics in various parts of the country, between May 2024 and October 2025. A self-administered questionnaire was used in the study to collect information on the frequency and reasons for ED and PHC visits both before and after the introduction of virtual clinics. Fisher's exact tests, Pearson's chi-squared, and descriptive statistics were used in the data analysis process. **Results:** Among the participants, 44% used virtual clinics once, 23% twice, and 33% more than twice. The establishment of virtual clinics led to 20% decrease in ED visits and 18% decrease in PHC visits. Preferred services included general consultations (76%), prescription renewals (49%), and follow-up appointments (48%). Factors contributing to reduction in in-person visits were shorter wait times (45.18%), better accessibility (39.61%), and reduced costs (36.23%). Demographic factors such as age, gender, and income level significantly influenced virtual clinic utilization patterns ($p < 0.001$). **Conclusion:** Virtual clinics have raised operational efficiency while simultaneously enhancing the accessibility and quality of healthcare. The findings align with Saudi Arabia's Vision 2030 objectives on the digitization of the healthcare sector.

Keywords: Telemedicine; Emergency service, hospital; Primary health care; Health services accessibility

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1. Introduction

Saudi Arabia's healthcare system has transformed significantly, driven by Vision 2030 to improve healthcare quality and accessibility. A key innovation is the establishment of virtual clinics for remote medical consultations and follow-ups via telecommunication. Virtual clinics can reduce the burden on emergency departments (ED) and primary healthcare centers (PHC), improve patient outcomes, and increase

healthcare efficiency. Telemedicine is not new and has been explored globally for decades. The COVID-19 pandemic accelerated its adoption, emphasizing its role in maintaining healthcare while minimizing physical contact. In Saudi Arabia, the Ministry of Health's promotion of telehealth services has substantially increased virtual clinic utilization (1). One notable development is the Seha Virtual Hospital, the world's largest and the Middle East's first advanced virtual healthcare provider. It offers telehealth services through top health consultants and specialists using cutting-edge medical technologies, serving all cities and governorates in Saudi Arabia. Supporting 130 hospitals, it provides over 30 specialized services. To date, 58,550 beneficiaries have been served, with an annual capacity of over 400,000 beneficiaries (2).

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The impact of virtual clinics on healthcare utilization, particularly ED and PHC visits, is a critical research area. EDs often face overcrowding, leading to long waits, increased costs, and reduced care quality (3). Similarly, primary care is the first point of contact for most healthcare needs, and increasing demand may overwhelm services and delay access to timely care. Telehealth offers an effective approach to improve access while supporting continuity of care (4). Virtual clinics offer an alternative for medical advice and treatment, potentially alleviating these pressures.

Research from various countries indicates that virtual clinics can reduce unnecessary ED visits and improve chronic condition management (5, 6). For example, a U.S. study found telemedicine visits for acute conditions significantly reduced subsequent ED visits (7). Additionally, virtual clinics enhance healthcare access in remote or underserved areas, promoting health equity (8). The establishment of virtual clinics in Saudi Arabia, especially due to COVID-19, has been significant. The pandemic caused a shift toward virtual clinics, maintaining healthcare services while minimizing virus transmission risks (9, 10). Virtual clinics are particularly beneficial for family medicine in rural areas with limited traditional healthcare access (11). High patient satisfaction indicates a positive reception (12). Utilization of virtual clinics in Saudi Arabia is rising, with significant population use and positive patient experiences during the pandemic (13, 14).

In Saudi Arabia, the implementation of virtual clinics supports Vision 2030's goals to digitize healthcare and improve population health. The National Transformation Program targets increased telemedicine use and enhanced PHC quality (15). However, empirical evidence on the impact of virtual clinics on ED and PHC visit frequency is limited. This gap highlights the need for comprehensive studies to evaluate these services' effectiveness. This national cross-sectional survey aimed to fill this gap by examining the effect of establishing virtual clinics on the frequency of visits to ED and PHC across Saudi Arabia. The study used data from the Ministry of Health and various healthcare institutions to assess trends and correlations. By providing robust evidence on the efficacy of virtual clinics, the study seeks to inform policymakers and healthcare providers about the potential benefits and challenges of integrating telemedicine into the Saudi healthcare system.

2. Methods

2.1. Study design and setting

A nationwide cross-sectional online survey was conducted in Saudi Arabia from May 2024 to October 2025 using a self-administered online questionnaire to collect data from participants across all regions of Saudi Arabia (Central, Southern, Eastern, Western, and Northern). The study targeted the general population, with an estimated population of approximately 34 million individuals at the time of the study (16). Data was gathered via a self-administered question-

naire. Informed consent was obtained from participants prior to completing the questionnaire, which was disseminated electronically through Google Forms.

All information was confidential and used exclusively for scientific purposes, adhering to the ethical guidelines for studies involving human participants. The King Faisal University ethical approval committee granted permission to perform this study (reference number: KFU-REC-2024-MAY-ETHICS2363). Informed consent was sought the first page, and participation in the study was completely voluntary and optional. No identifiable personal data was required for data analysis and publication. The study obtained ethical approval before data collection began.

2.2. Participants

The general population of Saudi Arabia from both genders who used virtual clinics and agreed to participate in the study were included. Participants who did not use virtual clinics and any responses lacking informed consent were excluded from the study.

2.3. Data gathering

The authors developed a standardized questionnaire in English and subsequently validated it through a panel of three expert academicians. Then the questionnaire was translated into Arabic by forward and backward translation technique to ensure the accuracy of translation. These experts thoroughly evaluated the study objectives to determine their content validity for all domains of the questionnaire (frequency and practice). The assessment was initially conducted individually, and subsequently, any disagreements were elaborated upon until a consensus was reached. The suggested modifications were implemented to enhance the validity of the questionnaire, resulting in the final format used in the present study. The internal consistency of the questionnaire was assessed using Cronbach's alpha, resulting in a coefficient of 0.72, indicating good reliability. A pilot study involving 10 participants was conducted to gather feedback, remarks, and advice on the questionnaire's transparency, simplicity, clarity of questions, and comprehension. Although the pilot study answers were excluded from the final analysis, the input was carefully reviewed, and adjustments were made to rectify any issues with double-barreled, confusing, and leading questions. This iterative process resulted in the development of a finalized version of the questionnaire.

The survey was distributed based on data collectors and investigators' networks. The questionnaire had 4 sections. The first section collected demographic information such as age, gender, marital status, employment status, income, education level, and health status in the form of chronic diseases. The second section covered the frequency of healthcare utilization in PHCs, EDs, and virtual clinics. The third section dealt with factors behind the change in the frequency of visits to the PHCs and EDs in presence of virtual clinics. The fourth section assessed various aspects of individuals' perceptions

and experiences with virtual clinics. Moreover, the likelihood of using virtual clinics for different purposes and challenges faced when using virtual clinics were evaluated.

The first page of the questionnaire included informed consent and a question regarding using the virtual clinics. The survey was conducted electronically using Google Forms. The "required to proceed" Google forms functionality was utilized to make sure the criteria for the research were met.

2.4. Statistical Analysis

The sample size was estimated using OpenEpi® ver3.0 software, which is indicative of the 34 million people living in Saudi Arabia. 385 was found to be the necessary representative sample size, with a 5% margin of error and a 95% confidence level. Nevertheless, in order to account for any exclusions, we tried to get a bigger sample size than anticipated. To accomplish this, non-probability convenience sampling techniques were used. The data was cleaned in an Excel sheet and imported to SPSS software version 27 (Statistical Product and Service Solutions, SPSS Inc, Chicago, IL, USA). Descriptive statistics were used for calculating frequencies with percentages for categorical variables. The Pearson's chi-squared and Fisher's exact tests were used to identify determinants of utilization of virtual clinics. A p-value of < 0.05 was considered significant for this study.

3. Results

3.1. Baseline characteristics of participants

The study included 10,000 participants. Half of the participants (50%) were aged 18-30 years, 71% were females, 96% Saudi, 50% married, 43% in the Eastern region, 58% had a bachelor's degree, 20% were in the governmental sector, 14% in the private sector, 28% students, 13% in the medical sector, 2.7% in the military sector, and 13% were not working. 29% had a monthly income of 5000-10,000 Saudi riyal. Regarding medical insurance, 66% did not have insurance and 34% did. Table 1 summarizes the baseline characteristics of studied patients.

Before establishing virtual clinics, 16% visited PHC clinics every 6 months, 21% every 2-3 months, 5.9% more than once a month, 2.1% never, 13% once a month, and 42% rarely. For ED visits, 14% went every 6 months, 11% every 2-3 months, 4.6% more than once a month, 9.2% never, 7.9% once a month, and 54% rarely. Since the establishment of virtual clinics, 33% used them more than twice, 44% once, and 23% twice. Frequency of virtual clinic use was more than once a month for 5.7%, once a month for 9.4%, every 2-3 months for 15% of the participants, every 6 months for 15%, and rarely for 55%. Preferred services through virtual clinics included general consultation (76%), renewing medical prescriptions (49%), follow-up (48%), mental health services (26%), and other (0.7%).

3.2. Associated factors of virtual clinic utilization

Associated factors of virtual clinics utilization are shown in table 2. Being young, female, Saudi, and married was significantly associated with single use of virtual clinics ($p < 0.001$). Most participants from the Eastern region used it more than twice, while most participants from other regions used it once ($p < 0.001$). Educational level differences were also significant ($p < 0.001$). Most participants with educational backgrounds used virtual clinics only once.

Students and governmental, private, military, and medical sector employees had significantly used virtual clinics only once, while not working individuals used more than twice ($p < 0.001$). Earning a high monthly income (more than 20,000 SAR) was significantly associated with using virtual clinics more than twice, while earning a low income was significantly associated with a single use ($p < 0.001$). Medical insurance was significantly associated with single use of virtual clinics ($p < 0.001$).

3.3. Experiences, difficulties, and satisfaction with virtual clinics

Experiences, difficulties, and satisfaction with virtual clinics are summarized in table 3. 45% reported no difficulties. Technical issues (35%), limited personal interaction with the doctor (24%), difficulty expressing health problems (19%), problems covering medical insurance (9.4%), and lack of flexibility in clinic timing (0.2%) were amongst the most frequent difficulties when using virtual clinics. Most participants were somewhat satisfied (36%) with virtual clinic services, while only 1.8% were very unsatisfied. Approximately 77% believed that virtual clinics effectively decreased the frequency of visits to emergency departments or primary healthcare clinics. Lack of physical examination (62%), technical difficulties or communication problems (49%), inadequate diagnosis or treatment options (46%), limited personal interaction with the doctor (40%), and privacy and security issues (18%) were barriers to using virtual clinics.

3.4. Impact of virtual clinics on ED and PHC clinic visits

Table 4 shows the trend of virtual clinic usage and its impacts on frequency of ED and PHC visits. Since using virtual clinics, the frequency of ED visits decreased significantly in 20%, did not change in 41%, and increased significantly in 4.0% of the cases. Similarly, the frequency of PHC clinic visits decreased significantly for 18%, did not change for 37%, and increased significantly for 3.7%.

3.5. Effective factors of change in frequency of ED and PHC visiting

The factors affecting the change in frequency of visiting PHC clinics (figure 1) were providing virtual clinic services (55.86%), shorter waiting time for virtual appointments compared to PHC clinics (45.18%), accessibility (transporta-

tion problems) (39.61%), reduced cost (36.23%), greater privacy and confidentiality (32.30%), providing better care for chronic diseases through virtual clinics (30.82%), high-quality healthcare (30.13%), and fear of infection (COVID-19) (20.90%).

The factors affecting the change in frequency of visiting the ED (figure 1) were providing virtual clinic services (49.62%), accessibility (transportation problems) (49.00%), greater privacy and confidentiality (47.11%), providing better care for chronic diseases through virtual clinics (36.51%), reduced cost (33.98%), shorter waiting time for virtual appointments compared to emergency departments (32.16%), high-quality healthcare (28.13%), fear of infection (COVID-19) (24.28%), and other (1.92%).

4. Discussion

We observed a notable decrease in ED and PHC visits (20% and 18%, respectively) following the implementation of virtual clinics in Saudi Arabia. The decision to utilize these services is often influenced by the preference for reduced waiting times (45.18%), convenient accessibility (39.6%), and minimal financial burden (36%). The survey findings indicated that low self-assurance played a significant role, as only 26% of the respondents expressed confidence in their abilities. Those earning a financial income of over 20,000 SAR were more likely to visit virtual clinics; conversely, participants with medical insurance and the low-income demographic were associated with one-time visits ($P < 0.001$). Based on our findings, nearly half (46%) of the respondents stated that they did not encounter any challenges with the setup of virtual clinics or technical issues. They expressed some level of satisfaction, with 36% indicating their contentment. Multiple research projects conducted in different nations have investigated the effects of virtual clinics on healthcare usage, specifically in decreasing unnecessary visits to the emergency room and enhancing the management of chronic conditions. These investigations consistently demonstrated favorable results and advantages of virtual clinics.

After the implementation of telemedicine-based virtual clinics, there was a 20% reduction in ED visits and an 18% decrease in PHC visits, as indicated by our research findings. These results are consistent with a study carried out by Almathami et al., which highlighted the capacity of telemedicine to lower the unnecessary ED visits (17).

The introduction of virtual clinics has had a significant impact on the frequency of visits to emergency departments (EDs) and primary healthcare centers (PHCs) in Saudi Arabia. A large majority of participants (77%) indicated that virtual clinics effectively decreased the frequency of ED and PHC visits. This aligns with the results of a study by Uscher-Pin et al. in the United States, which revealed that telemedicine reduced ED visits by around 20% by efficiently managing chronic conditions and minor ailments remotely (18). Similarly, research by Haleem, et al. and Alsubaie et al. showed

that virtual clinics can lower unnecessary ED visits and enhance the management of chronic conditions (11, 19).

Our study revealed a notable reduction in the number of visits to primary healthcare centers after virtual clinics were implemented. This aligns with the findings of Dorsey et al., indicating that virtual clinics can improve access to healthcare in remote or underserved regions, thus advancing health equity (8).

The results of our study indicated that the majority of participants (76%) utilized virtual clinics for general consultations, with a substantial proportion (49%) using them for renewing medications and 48% for follow-up appointments. This finding suggests that virtual clinics effectively address various primary healthcare needs, possibly easing the strain on primary healthcare centers. This is consistent with studies conducted in Saudi Arabia, which have demonstrated that virtual clinics can improve healthcare accessibility and reduce the pressure on primary healthcare centers (PHC), which often struggle to provide timely care (17, 19).

In our study, we also found that virtual clinics are widely used for mental health services, with 26% of people choosing this approach. This aligns with previous studies that have emphasized the advantages of telemedicine in enhancing access to mental healthcare and offering a convenient option for individuals in need of support (20). This indicates a promising outlook for the future of telemedicine.

The participants in the study displayed a notably low level of confidence, with only 26% stating that they felt confident in their abilities. This lack of confidence may be attributed to the novelty of the virtual clinic idea, and the necessity for continuous education and assistance to boost user confidence and encourage the efficient use of virtual clinics, as stated by Mold et al. (21).

Our study reported high patient satisfaction, which aligns with a previous study in Saudi Arabia, which stated that virtual clinics in the country have garnered positive feedback from patients, especially during the COVID-19 pandemic. These results align with a separate study that evaluated patient satisfaction with telemedicine during the COVID-19 pandemic in Saudi Arabia (22). These findings demonstrate an increasing willingness among the Saudi population to use telemedicine services, supporting the country's efforts to modernize healthcare and enhance public health in line with Vision 2030 (15).

The results of the study also indicate that the use of virtual clinics is influenced by financial considerations. Individuals with higher incomes ($>20,000$ SAR) were more inclined to make use of these services, possibly due to their greater access to technology and healthcare facilities. Conversely, individuals with medical insurance were linked to occasional visits, suggesting that they may be using virtual clinics to complement their regular healthcare. This highlights the need to address fairness and ensure equal access to virtual healthcare, especially for low-income groups, as noted by Shaw et al. (23).

Our study found that virtual clinic utilization was rising in Saudi Arabia, showing that these services have become increasingly popular and accepted by the public. The rising utilization of virtual clinics, along with favorable patient experiences during the COVID-19 outbreak, indicates that these clinics have successfully met people's healthcare requirements as reported by Parimbelli et al. and Wang et al. (24, 25).

5. Limitations

This study has several strengths and limitations. To our knowledge, it is the first nationwide study in Saudi Arabia to evaluate the impact of virtual clinics on emergency department and primary healthcare visits. However, the use of an online survey may have underrepresented individuals aged 60 years and older and those with limited internet access, introducing potential selection bias. The cross-sectional and self-reported design also limits causal inference and may be subject to recall bias. Although the large sample of 10,000 participants from multiple geographic regions enhances the external validity of the findings, differences in healthcare organization, digital infrastructure, technology access, and population characteristics may limit the generalisability of the results to other countries. Further longitudinal studies are needed to confirm these findings and evaluate whether specialized virtual clinic services can sustainably reduce reliance on in-person healthcare visits.

6. Conclusions

The potential of virtual clinics in Saudi Arabia to effectively reduce visits to EDs and PHCs, particularly in remote areas, has been shown. However, addressing barriers such as the need for physical examinations, technical challenges, and communication difficulties is crucial to fully realize their benefits. Future research needs to prioritize longitudinal studies to establish causation, account for regional technological disparities, and assess the efficacy of virtual clinics for various medical conditions. The integration of virtual clinics into the healthcare system is in line with Saudi Arabia's Vision 2030 objectives, offering the promise of improved healthcare delivery and efficiency.

7. Declarations

7.1. Acknowledgments

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7.2. Authors' contributions

All authors contributed to the study conception and design, data collection, analysis, manuscript preparation, and approved the final version.

7.3. Data availability

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

7.4. Funding and support

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

7.5. Conflict of interest

The authors declare that they have no competing interests.

7.6. Using artificial intelligence chatbots

Artificial intelligence tools were used only to improve the language and readability of the manuscript. All scientific content, data interpretation, and final manuscript approval were performed by the authors.

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Table 1: Demographic characteristics of study participants (N = 10,000)

Characteristic	Number (%)	Characteristic	Number (%)
Age (year)		Residence	
18-30	5,044 (50)	Central Region	755 (7.6)
31-45	2,880 (29)	Eastern Region	4,261 (43)
46-60	1,629 (16)	Northern Region	942 (9.4)
Less than 18	296 (3.0)	Southern Region	2,129 (21)
More than 60	151 (1.5)	Western Region	1,913 (19)
Gender		Educational level	
Female	7,123 (71)	Before university education	2,014 (20)
Male	2,877 (29)	Diploma	1,584 (16)
Nationality		Bachelor degree	5,810 (58)
Non-Saudi	427 (4.3)	Master/PhD	592 (5.9)
Saudi	9,573 (96)	Monthly income (SAR)	
Marital status		Less than 5000	2,644 (26)
Married	5,041 (50)	5000-10,000	2,948 (29)
Unmarried	4,959 (50)	10,001-15,000	2,133 (21)
Occupation		15,001-20,000	1,282 (13)
Governmental sector	1,977 (20)	More than 20,000	993 (9.9)
Private sector	1,401 (14)	Medical insurance	
Student	2,757 (28)	No	6,644 (66)
Medical sector	1,288 (13)	Yes	3,356 (34)
Military sector	268 (2.7)	-	-
Not working	1,324 (13)	-	-
Other	985 (9.9)	-	-

SAR: Saudi Arabia Rial.

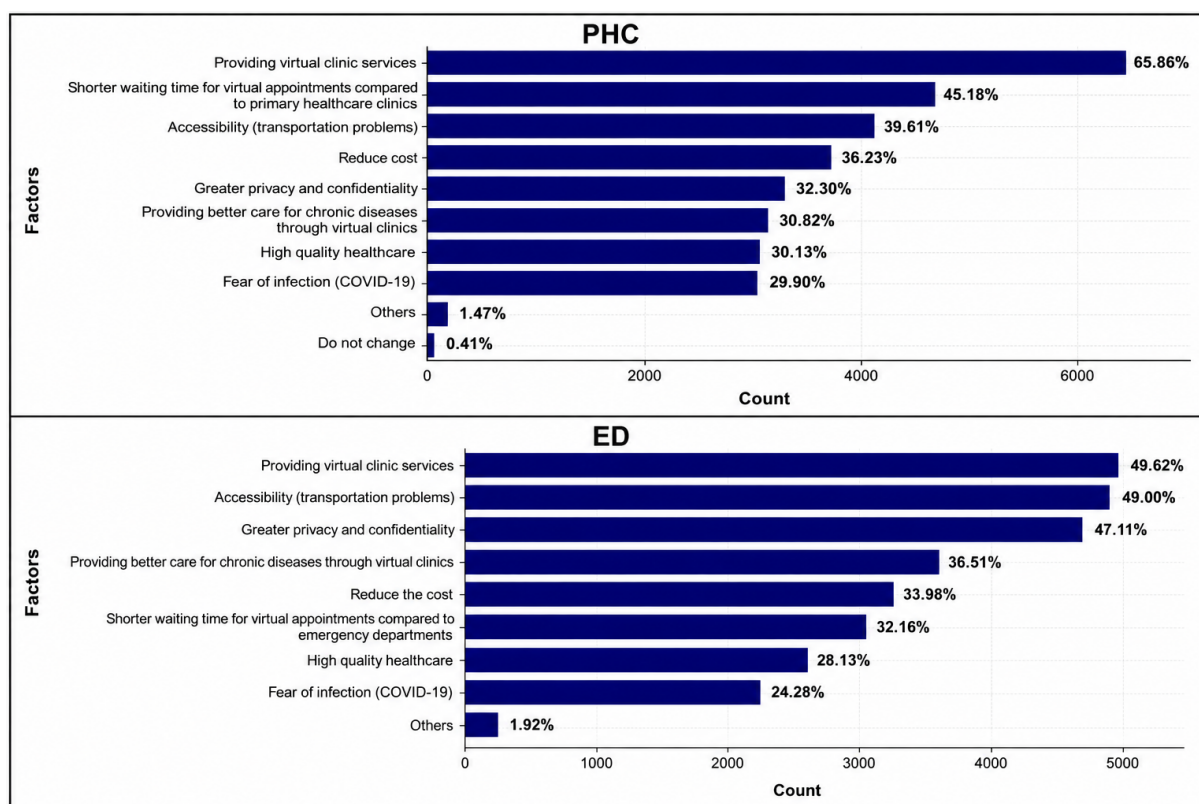
**Figure 1:** Key factors influencing the reduction of primary healthcare (PHC) and emergency department (ED) visits by study participants.

Table 2: Associated factors of virtual clinics utilization by study participants

Characteristic	Utilization of virtual clinics			
	Once n = 4,383	Twice n = 2,34	> 2 times n = 3,269	P
Age (year)				
< 18	133 (3.0)	75 (3.2)	88 (2.7)	<0.001
18-30	2,272 (52)	1,356 (58)	1,416 (43)	
31-45	1,273 (29)	528 (22)	1,079 (33)	
46-60	614 (14)	389 (17)	626 (19)	
More than 60	91 (2.1)	0 (0)	60 (1.8)	
Gender				
Female	2,983 (68)	1,672 (71)	2,468 (75)	<0.001
Male	1,400 (32)	676 (29)	801 (25)	
Nationality				
Non-Saudi	235 (5.4)	133 (5.7)	59 (1.8)	<0.001
Saudi	4,148 (95)	2,215 (94)	3,210 (98)	
Marital status				
Married	2,149 (49)	990 (42)	1,902 (58)	<0.001
Unmarried	2,234 (51)	1,358 (58)	1,367 (42)	
Residence				
Central Region	286 (6.5)	249 (11)	220 (6.7)	<0.001
Eastern Region	1,633 (37)	943 (40)	1,685 (52)	
Northern Region	428 (9.8)	250 (11)	264 (8.1)	
Southern Region	1,136 (26)	421 (18)	572 (17)	
Western Region	900 (21)	485 (21)	528 (16)	
Educational level				
Before university	909 (21)	428 (18)	677 (21)	<0.001
Diploma	655 (15)	328 (14)	601 (18)	
Bachelor degree	2,596 (59)	1,400 (60)	1,814 (55)	
Master/PhD	223 (5.1)	192 (8.2)	177 (5.4)	
Occupation				
Governmental sector	988 (23)	376 (16)	613 (19)	<0.001
Private sector	599 (14)	313 (13)	489 (15)	
Student	1,241 (28)	751 (32)	765 (23)	
Medical sector	506 (12)	384 (16)	398 (12)	
Military sector	135 (3.1)	90 (3.8)	43 (1.3)	
Not working	505 (12)	235 (10)	584 (18)	
Other	409 (9.3)	199 (8.5)	377 (12)	
Monthly income (SAR)				
Less than 5000	1,163 (27)	517 (22)	964 (29)	<0.001
5000-10,000	1,469 (34)	714 (30)	765 (23)	
10,001-15,000	985 (22)	536 (23)	612 (19)	
15,001-20,000	481 (11)	342 (15)	459 (14)	
More than 20,000	285 (6.5)	239 (10)	469 (14)	
Medical insurance				
No	3,056 (70)	1,408 (60)	2,180 (67)	<0.001
Yes	1,327 (30)	940 (40)	1,089 (33)	

SAR: Saudi Arabia Rial.

Table 3: Experiences, difficulties, and satisfaction with virtual clinics usage by study participants (N = 10,000)

Characteristic	Number (%)
Difficulties when using virtual clinics	
No difficulty	4,505 (45)
Technical issues	3,524 (35)
Limited personal interaction with the doctor	2,423 (24)
Difficulty expressing health problems	1,918 (19)
A problem in covering medical insurance	937 (9.4)
Lack of flexibility in clinic timing	16 (0.2)
Satisfaction with virtual clinic services	
Very satisfied	4,119 (41)
Somewhat satisfied	3,607 (36)
Neutral	1,731 (17)
Somewhat unsatisfied	367 (3.7)
Very Unsatisfied	176 (1.8)
Virtual clinics can effectively decrease the frequency of visiting EDs or PHC	
No	1,417 (14)
Yes	7,689 (77)
I do not know	894 (8.9)
Barriers to using virtual clinics	
Lack of physical examination	6,151 (62)
Technical difficulty or communication problems	4,946 (49)
Inadequate diagnosis or treatment options	4,566 (46)
Limited personal interaction with the doctor	3,970 (40)
Privacy and security issues	1,829 (18)
No barriers	59 (0.6)

ED: emergency department; PHC: primary healthcare.

Table 4: Patterns of virtual clinic usage by study participants and its impacts on frequency of ED and PHC visits (N = 10,000)

Characteristic	Number (%)
Frequency of visiting PHC clinics before establishing virtual clinics	
Every 2-3 months	2,144 (21)
Every 6 months	1,610 (16)
More than once a month	587 (5.9)
Never	208 (2.1)
Once a month	1,252 (13)
Rarely	4,199 (42)
Frequency of visiting the ED before establishing virtual clinics	
Every 2-3 months	1,055 (11)
Every 6 months	1,366 (14)
More than once a month	463 (4.6)
Never	922 (9.2)
Once a month	794 (7.9)
Rarely	5,400 (54)
Frequency of using virtual clinics since the establishment	
More than 2 times	3,269 (33)
Once	4,383 (44)
Twice	2,348 (23)
Frequency of use of virtual clinics	
Every 2-3 months	1,549 (15)
Every 6 months	1,491 (15)
More than once a month	568 (5.7)
Once a month	938 (9.4)
Rarely	5,454 (55)
Type of medical services you prefer to use through virtual clinics	
General consultation	7,638 (76)
Renewing medical prescription	4,911 (49)
Follow-up	4,764 (48)
Mental health services	2,641 (26)
Other	73 (0.7)
Since your use of virtual clinics, what is the change in your frequency of visiting the ED	
Decreased significantly	1,992 (20)
Decreased slightly	2,827 (28)
Did not change	4,058 (41)
Increased slightly	719 (7.2)
Increased significantly	404 (4.0)
Since your use of virtual clinics, what is the change in your frequency of visiting PHC	
Decreased significantly	1,790 (18)
Decreased slightly	3,343 (33)
Did not change	3,747 (37)
Increased slightly	747 (7.5)
Increased significantly	373 (3.7)

ED: emergency department; PHC: primary healthcare.