

Virtual Online Consultation: Advantages and Limitations from Patients' Perspectives

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ABSTRACT

Objectives: To assess patient satisfaction with virtual online consultation (VOC) in the general population and determine sociodemographic factors related to the level of satisfaction.

Methodology: The cross-sectional study was conducted between January and December 2024 and included 377 participants. A questionnaire based on demographic profile, use of information channels, and experience of VOC was given out. The frequencies, percentages, means, and standard deviations were determined. Chi-square tests were used to assess the relationship between demographic variables and satisfaction, and binary logistic regression was used to determine independent predictors of satisfaction.

Results: A total of 377 participants were included, with most being young adults and students. The VOC satisfaction scale showed good internal consistency (Cronbach's alpha = 0.874). Most of the respondents (82.8%, n=312) were rated highly satisfied with a mean total score of 45.55 + 6.13. The relational aspects of VOC, such as provider understanding (81.2%), respectful treatment (78.0%), were rated best. The only statistically significant bivariate correlation was found between ethnicity and satisfaction ($\chi^2 = 11.305$, $p = 0.023$). Logistic regression showed that none of the demographic variables was significantly predicted to be satisfied independently (Nagelkerke $R^2 = 0.019$).

Conclusion: Most participants were very satisfied with VOC especially in terms of communication and interaction with providers. The areas of privacy and comfort still need improvement. The only sociodemographic factor that was related to satisfaction was ethnicity, but this did not hold in the multivariate analysis.

KEYWORDS: Health Services Accessibility, Patient Satisfaction, Remote Consultation, Telemedicine, Video Conferencing

INTRODUCTION

The growing integration of technology into

healthcare has resulted in the widespread use of virtual online consultations, which enable patients to contact healthcare providers remotely. Telemedicine is defined as the use of telecommunication and online technologies for the provision of medical services or care to patients at long distance.¹ The popularity of virtual online consultation has increased due to its convenience and accessibility. It was also suggested platform to provide health services during the COVID-19 pandemic.² To significantly reduce the in-clinic visits, virtual online consultation is being used in different specialties including orthopaedics and psychiatry.^{3,4} Health services face rising costs as a result of increasing disease prevalence, high 'did not attend' (DNA) rates and poor patient engagement, resulting in poor health outcomes and greater use of emergency care.⁵ Virtual online

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consultations have been shown to have several potential advantages. Firstly, virtual online consultations may reduce the time and cost associated with traveling to a healthcare facility, which can benefit both patients and healthcare providers. With growing demand for health services and finite resources, digital health services are one of the fastest growing areas of health care provision, with a market potential that is expected to grow at a compound annual rate of 14% in the coming years.⁶ Telemedicine and virtual software platforms offer affordable, effective, and attractive option. Thus, they can be utilized to manage the pandemic². Text messaging medium was the most popular medium among those who used it proactively. Other mediums of consultation included, telephone, online portals and email consultation⁵. In 2021, according to a study conducted in India, people who have consulted doctors online, the main advantages of online consultations cited by patients included a lower risk of infection, reduced waiting time and travel time.⁷ Despite the convenience and accessibility of virtual online consultations, there are also limitations that need to be considered. Remote consultations can lead to missed diagnoses, missed safeguarding risks, missed public health interventions, and increased use of investigations and referrals.⁸ A research showed that people who have consulted doctors online, the main disadvantages included a lack of physical examination, a perception that this was not as satisfying as a face-to face consultation and difficulty in communication. However, given the choice, almost two-thirds felt they would still prefer face-to face consultations.⁷ Virtual care is one option that may help to alleviate health inequality by enhancing access and availability of health services. However, there are worries that virtual care services may exacerbate existing health inequities if treatments are not accessible, available, and acceptable to the vulnerable population. The World Health Organization (WHO) has identified gender, education, income, work position, and ethnicity as the key

determinants related with health inequity.⁹ Another study conducted internationally showed that 42% of the participants chose virtual consultation as their preferred follow up modality. Surgeons expressed great satisfaction with virtual consultation use.¹⁰

To date, there has been limited research on the advantages and limitations of virtual online consultations, particularly in the context of healthcare. Therefore, this research aims to explore the advantages and limitations of virtual online consultations from the perspectives of patients. The objectives of the study were to assess the advantages and limitations of virtual online consultations among the general population of the twin cities of Rawalpindi and Islamabad, and to compare the levels of satisfaction between physical and virtual consultation in people belonging to various ethnicities, educational backgrounds, social set ups and occupations.

METHODOLOGY

An analytical cross-sectional study was conducted on general population of twin cities i.e., Rawalpindi and Islamabad from January to December 2024. Participants were enrolled through convenience sampling technique. Ethical approval was taken from ethical review committee of Army Medical College, Rawalpindi with the ERC ID 332. All the patients and their attendants aged 18-65 years, coming to Pakistan Emirate Military Hospital / Combined Military Hospital, having access to internet facilities at their home, and the appropriate reading and cognitive ability to understand and participate in the virtual consultation process, as well as ability to provide feedback on their experience were included in the study. People who had no access to internet facility and never used virtual online consultation were excluded from the study. People with diagnosed psychiatric illness and not willing to participate were also excluded. Open-Epi calculator was used to calculate sample size of 377, keeping 5% margin of error, 95% confidence interval and population proportion

50%. Data was collected by the interviewer who administered the questionnaire after taking informed consent. Data collection tool was divided into 3 sections. First section included demographics profile, second section was related to type of information channels used which included relatives and friends, mass media, social media, and billboards. The third section was about their experience regarding virtual online consultation. The answers were rated using Likert score (Agree=1, Neutral=2, Disagree=3). Total score of the questionnaire was calculated to be 54. The cut-off value was set at 72% of total score which came out to be 40. The cut-off value was used to group the responses into the high and the low scores. Since the questionnaire was not previously validated, a pilot study was conducted on 30 participants prior to the main data collection phase. These participants were selected from the same target population but were not included in the final analysis. The purpose of the pilot study was to assess the clarity, comprehension, and feasibility of the questionnaire items. According to the feedback given, slight modifications to the wording were carried out to enhance the clarity of items. To determine the internal consistency of the final 18-item scale, the Cronbach alpha was used to give a value of 0.874, which is considered good reliability. IBM Statistical Package for the Social Sciences (SPSS) version 26 was used to analyze the data. Frequencies and percentages of categorical variables were determined using the descriptive analysis technique whereas continuous variables used mean and standard deviation to compute their mean and standard deviation. To determine the relationship between independent and dependent variables, chi-square test was used. Binary logistic regression was conducted to determine independent predictors of VOC satisfaction and the findings were presented as odd ratios (OR) with 95% confidence intervals (CI). The statistical significance was established as $p < 0.05$.

RESULTS

A total of 377 participants were included in this study. Table I presents the complete sociodemographic profile of the sample.

Table I: Sociodemographic Characteristics of Participants (N = 377)

Variable	Category	n	%
Mean \pm SD = 22.18 \pm 6.87			
Age (years)	18–25	328	87.0
	26–35	31	8.2
	36–45	8	2.1
	46–55	6	1.6
	56 and above	4	1.1
Gender	Male	249	66.0
	Female	128	34.0
Ethnicity	Pakistani	238	63.1
	Arab	16	4.2
	African	9	2.4
	South Asian (other)	43	11.4
	Other/Mixed	71	18.8
Education Level	Primary/Secondary	7	1.9
	Undergraduate	307	81.4
	Postgraduate	63	16.7
Occupation	Student	295	78.2
	Army/Cadet	27	7.2
	Doctor/Physician	17	4.5
	Housewife	15	4.0
	Unemployed	4	1.1
	Other	19	5.0
Primary Source of VOC Information	Healthcare provider (GP/Doctor)	92	24.4
	Nurse	34	9.0
	Friends/Family	159	42.2
	Internet/Media	15	4.0
	Other	77	20.4
Trust in Information Channel	Very low	28	7.4
	Low	102	27.1
	High	106	28.1
	Very high	141	37.4
VOC Satisfaction Level	Low satisfaction (score <40)	65	17.2
	High satisfaction (score \geq 40)	312	82.8
Total		377	100.0

The internal consistency of the 18-item VOC satisfaction scale was assessed using Cronbach's alpha. The overall alpha coefficient was 0.874, indicating good reliability according to established benchmarks ($\alpha \geq 0.70$ acceptable; ≥ 0.80 good). Item-level analysis showed that all items contributed positively to scale reliability. The total scale score ranged from 22 to 54, with a mean of 45.55 (SD = 6.13) as shown in table II.

Item	Statement	Mean ± SD	α if deleted
1	Understands my problems	1.23 ± 0.51	0.871
2	Beneficial to see healthcare provider	1.27 ± 0.51	0.875
3	Valuable to hear and see	1.20 ± 0.48	0.869
4	Privacy protected	1.73 ± 0.74	0.874
5	Appointment timing suitable	1.68 ± 0.67	0.870
6	Comfortable communication	1.37 ± 0.57	0.864
7	Would see healthcare provider again	1.47 ± 0.66	0.866
8	Healthcare provider explains problem well	1.46 ± 0.61	0.863
9	Healthcare provider gives clear explanation	1.44 ± 0.63	0.864
10	Involved in decisions	1.42 ± 0.61	0.861
11	Shows interest in my problem	1.39 ± 0.61	0.864
12	Asks personal questions appropriately	1.38 ± 0.56	0.865
13	Treats with respect	1.27 ± 0.54	0.864
14	Comforting to see Healthcare provider	1.27 ± 0.53	0.866
15	Healthcare provider is well-informed	1.41 ± 0.62	0.865
16	Easily accessible	1.42 ± 0.60	0.864
17	Would like to visit again	1.38 ± 0.58	0.863
18	Comfortable experience overall	1.83 ± 0.75	0.882
	Overall Scale (18 items)	45.55 ± 6.13 (total score)	$\alpha = 0.874$

Chi-square tests of independence were conducted to examine associations between each sociodemographic variable and VOC satisfaction category. Of all variables examined, only ethnicity showed a statistically significant association with VOC satisfaction category ($\chi^2(4) = 11.305$,

$p = 0.023$). All other variables — gender ($\chi^2(1) = 0.547$, $p = 0.460$), age group ($\chi^2(4) = 3.419$, $p = 0.490$), education ($\chi^2(2) = 1.639$, $p = 0.441$), occupation ($\chi^2(5) = 2.767$, $p = 0.736$), information source ($\chi^2(4) = 5.483$, $p = 0.241$), and trust in channel ($\chi^2(3) = 0.313$, $p = 0.958$) — were not significantly associated with satisfaction category. Results are presented in Table III.

Variable	χ^2	df	p-value	Significant?
Gender	0.547	1	0.460	No
Age Group	3.419	4	0.490	No
Ethnicity	11.305	4	0.023	Yes*
Education Level	1.639	2	0.441	No
Occupation	2.767	5	0.736	No
Info Source (InfoVOC)	5.483	4	0.241	No
Trust in Channel	0.313	3	0.958	No

Note. *Significant at $p < 0.05$.

An independent-samples t-test confirmed that total VOC scores differed significantly between low- and high-satisfaction groups (Low: $M = 35.54$, $SD = 4.17$; High: $M = 47.64$, $SD = 4.07$; $t(375) = -21.74$, $p < 0.001$), validating the criterion-related validity of the satisfaction classification. A binary logistic regression was conducted to examine the simultaneous predictive value of sociodemographic variables and information-seeking behaviour on VOC satisfaction category. The dependent variable was coded as 0 (Low satisfaction, $n = 65$) and 1 (High satisfaction, $n = 312$). Predictors entered in a single block included: gender, age group, ethnicity, education level, occupation, information source, and trust in channel. The overall logistic regression model was not statistically significant ($\chi^2(7) = 6.72$, $p = 0.459$), and model fit was poor (Nagelkerke $R^2 = 0.019$), indicating that the demographic and information-source variables included in this model did not significantly predict VOC satisfaction

category as a group. None of the individual predictors reached statistical significance as shown in table IV: gender (OR = 1.231, 95% CI [0.678–2.235], $p = 0.494$), age group (OR = 1.047, 95% CI [0.623–1.760], $p = 0.862$), ethnicity (OR = 0.922, 95% CI [0.786–1.081], $p = 0.316$), education level (OR = 1.590, 95% CI [0.742–3.407], $p = 0.233$), occupation (OR = 1.029, 95% CI [0.809–1.308], $p = 0.815$), information source (OR = 0.909, 95% CI [0.746–1.108], $p = 0.345$), and trust in channel (OR = 1.051, 95% CI [0.793–1.393], $p = 0.730$).

Variable	B	S.E.	Wald	df	OR	95% CI	P Value
Gender	0.208	0.304	0.467	1	1.231	0.678–2.235	0.494
Age Group	0.046	0.265	0.030	1	1.047	0.623–1.760	0.862
Ethnicity	-0.082	0.081	1.005	1	0.922	0.786–1.081	0.316
Education Level	0.464	0.389	1.425	1	1.590	0.742–3.407	0.233
Occupation	0.029	0.123	0.055	1	1.029	0.809–1.308	0.815
Info Source (Info VOC)	-0.095	0.101	0.891	1	0.909	0.746–1.108	0.345
Trust in Channel	0.050	0.144	0.119	1	1.051	0.793–1.393	0.730

DISCUSSION

The research was carried out to evaluate the benefits and drawbacks of virtual online consultation (VOC) in the eyes of the general population with a bias towards sociodemographic predictors of satisfaction. The total participants who were able to fill the 18-item VOC satisfaction scale (Cronbach's 0.874) were 377 with most of them (82.8% or 312) being highly satisfied. Although this represents an encouraging overall pattern, chi-square tests and binary logistic regression have shown that the majority of demographic factors did not have an independent effect on the satisfaction category, indicating the complexity of telehealth acceptance and its predictors.

In the current research, males constituted 66.0% of the sample ($n = 249$), and gender did not have statistically significant predictive ability in bivariate and multivariate analyses (OR = 1.231, $p = 0.494$). However, directional differences in the data indicated that males indicated a slightly higher level of satisfaction which is consistent with the evidence of South Asian environments where males have been reported to demonstrate greater use and dependence on telehealth tools compared to women.¹¹ This discrepancy has been attributed to socioeconomic disparities in access to digital technologies and differential health literacy between men and women, particularly in contexts where women face structural barriers to technology use.¹² This lack of significance in our multivariate model, however, is a warning about over-interpreting directional differences in a largely young, educated, urban sample.

Age emerged as a non-significant predictor in both chi-square analysis ($\chi^2(4) = 3.419$, $p = 0.490$) and logistic regression (OR = 1.047, $p = 0.862$). The given finding should be viewed in the context of the significant age distribution skew in this sample: 87.0% of the respondents were aged 18–25 years. Although this variability was limited, the directional trend aligned with the larger body of telehealth research in which younger people reported higher levels of comfort with online health services due to their technological fluency and because they used online information resources habitually.^{13,14} The small number of participants older than 45 years of age (only 10, 2.7%) prevented generalizing the findings about older adults, who were identified to experience more serious obstacles.¹⁵

Education level was not significantly associated with VOC satisfaction in this sample ($\chi^2(2) = 1.639$, $p = 0.441$; OR = 1.590, $p = 0.233$). The limited variability in education level within the sample—where 81.4% of participants held undergraduate degrees—may have attenuated or neutralized any potential effect. Theoretically, higher education level is expected to be associated with greater

digital health literacy and a better ability to navigate online consultation systems, yet evidence from diverse populations suggests that education is not always a significant predictor of telehealth use or satisfaction when samples are predominantly well-educated and digitally literate.¹⁶ Studies conducted in diverse populations have demonstrated that individuals from lower socioeconomic and educational backgrounds face barriers to telehealth engagement, including limited device access, data costs, and low confidence in using digital interfaces.¹⁷ The absence of an education effect in our cohort most plausibly reflects a ceiling effect introduced by a sample in which the vast majority of participants were already well-educated and digitally capable.

The primary source of information about VOC was friends and family (42.2%), healthcare providers (24.4%), other sources (20.4%), nurses (9.0%), and the internet or media (4.0%). Despite this distribution, there was no significant association between information source and satisfaction ($\chi^2(4) = 5.483, p = 0.241$). This observation is in contrast to the findings on other settings where formal healthcare channels and structured digital media are the most important channels in the communication of telehealth awareness and uptake and should be considered during future health promotion efforts to enhance the uptake and informed use of VOC.¹⁸ There was no significant difference in prediction of satisfaction based on trust in the information channel ($\chi^2(3) = 0.313, p = 0.958; OR = 1.051, p = 0.730$), which indicates that perceptions based on trust were largely similar in the groups of satisfaction used in this sample. The interpretation of this finding should be approached with caution, where the trust in digital health systems is identified as a vital prerequisite of telehealth engagement, especially in the communities with little prior experience of being offered formal healthcare services.¹⁹

The only sociodemographic variable to show a statistically significant bivariate relationship with VOC satisfaction was ethnicity ($\chi^2(4) = 11.305, p =$

0.023). This correlation was however not significant in the multivariate logistic regression model ($OR = 0.922, p = 0.316$) indicating that the differences by ethnicity level might be confounded by correlated demographic variables instead of an independent effect. Studies on the use of telehealth in various communities have demonstrated that ethnic minority groups tend to face more complex barriers to telehealth, such as language barriers, mistrust of digital health systems due to cultural factors, and socioeconomic deprivation.¹⁷ Future studies should use larger and more ethnically diverse samples to separate these interactions. On the item level, the most endorsed elements of VOC were characteristics that had a relational and communicative component of the encounter: 83.0% agreed that it was worth seeing and hearing, 81.2% said that their healthcare provider demonstrated a sufficient understanding of their problems, and 78.0% said they were treated with respect. These results confirm the communicative appropriateness of VOC as a platform to interact with patients and are congruent with the existing evidence of the clinical usefulness of video-based consultations in a variety of healthcare environments.^{20,21} On the other hand, issues related to privacy (only 44.8% agreed that their privacy was maintained) and the overall comfort during the experience (38.2% agreement) were the most commonly identified issues. Privacy issues when using VOC are well-explored in the literature and raise ethical and regulatory concerns for healthcare providers, especially in an environment where consultations might take place in common domestic areas, and where digital data protection frameworks are still in their infancy.²⁰

The total logistic regression did not show significant results ($\chi^2(7) = 6.72, p = 0.459; Nagelkerke R^2 = 0.019$), which means that all the demographic and information-access predictors studied did not explain much of the VOC satisfaction variance. This result is not unique to satisfaction studies, in which attitudinal, contextual, and service-quality predictors are often

more effective predictors than demographic variables.¹⁹ Future studies should include more predictors, such as clinical quality indicators, consultation length, technical reliability, patient health literacy, and prior telehealth experience. The possibility of VOC as a tool to increase healthcare access should be highlighted, especially in areas where patients with chronic conditions pose a significant strain on the in-person health system. Telehealth and VOC provide an effective avenue to decrease the need to travel, enhance continuity of care, and reach underserved communities, as long as the digital equity problem is properly tackled.¹⁵ A number of limitations must be admitted. The research used a convenience sample of an urban population, restricting the ability to generalize it to the rural, older, and less digitally literate populations. In addition, the sample was relatively homogeneous in terms of age and education, with 87.0% of participants aged 18–25 years, which could have diluted potentially significant demographic influences. All data were self-reported, which posed a threat of recall and social desirability bias. The cross-sectional design does not allow one to make a causal inference. Nonetheless, despite these restrictions, the results affirm feasibility and acceptability of VOC as a patient-centred care model. Future research should include more representative populations, such as older adults, rural residents, and individuals with lower digital literacy. In addition, it should incorporate clinical outcome measures, technical quality measurement, and longitudinal study designs to better reflect the changing world of telehealth satisfaction.

CONCLUSION

Most participants were highly satisfied with virtual online consultation, particularly regarding relational aspects, while privacy and comfort were key areas for improvement. No demographic variables significantly predicted satisfaction, and the observed association with ethnicity was not

maintained after adjustment and should be explored in larger samples of greater demographic diversity.

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