

Mobile health teleconsultation and telemedicine in operating outpatient departments during COVID-19 pandemic at a hospital in Eastern Nepal

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ABSTRACT

Background: Telemedicine provides a means to deliver healthcare across distances, enhancing efficiency and accessibility, especially in low- and middle-income countries. The COVID-19 pandemic highlighted its importance by reducing the risk of virus transmission while maintaining healthcare delivery. This study evaluates the telemedicine program implemented at B.P. Koirala Institute of Health Sciences (BPKIHS), Nepal, which provided specialist services to remote districts via teleconsultation during the 2020 lockdown. The objectives were to identify the number of patients, the major complaints, and the follow-up departments during teleconsultation. **Methods:** A retrospective analysis was conducted on teleconsultation data from March 1 to August 31, 2020, across various outpatient departments at BPKIHS. Data from 10,901 patients were reviewed, with variables including age, gender, residence, and consultation medium. Descriptive statistics were calculated using SPSS (version 22). **Results:** Most of the patients (55.46%) were female, and the majority (30.84%) aged 21–30 years. Most consultations were from the Sunsari district (54.8%) and Koshi state (88.9%). Voice calls were the primary medium (39.62%), followed by WhatsApp video calls (30.08%). Obstetrics and gynecology had the highest consultation rate (16.15%), followed by dermatology (14.4%) and psychiatry (10.37%). Nearly half of the patients (45.0%) had follow-up consultations, primarily for dermatological issues (17.85%). **Conclusion:** The findings underscore telemedicine's role in facilitating healthcare access, particularly for women and residents of remote areas, by reducing travel and exposure risks. This study highlights the need for further integration of telehealth technologies to enhance healthcare delivery, suggesting that teleconsultation can efficiently meet healthcare demands in resource-limited settings during and beyond pandemics.

Keywords: COVID-19 pandemic, low- and middle-income countries, Nepal, outpatient, resource-limited settings, teleconsultation

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Introduction

Telemedicine is defined as the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for the diagnosis, treatment and

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prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities.^[1,2] It makes the provision of quality healthcare in low- and middle-income countries more cost-effective, efficient, and accessible using information and communication technologies.^[3]

The outbreak of the COVID-19 pandemic was causing an overwhelming burden of patient management globally that stresses healthcare professionals (HCP) and increased the risk of infection with the virus.^[4] Changes in the way that healthcare was delivered during the pandemic were needed to reduce staff exposure to ill persons, preserve personal protective equipment (PPE), and minimize the impact of patient surges on facilities. In context of the pandemic, teleconsultation was promoted and scaled up to reduce the risk of transmission.^[5] It provided necessary care to patients while minimizing the transmission risk of the COVID-19 to healthcare personnel (HCP) and patients.^[3] It addressed the ongoing healthcare needs of patients with chronic illnesses to reduce in-person clinic visits. Such uses of telemedicine reduce human exposures (among healthcare workers and patients) to a range of infectious diseases and ensure that medical supplies are reserved for patients who need them.^[6]

The eHealth and Telemedicine Program was started in 2015 at B.P. Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal to ensure health service access of people of eastern mountainous districts through hospitals of the region. Specialist health service was provided through internet to different district hospitals and health centres operating in the regions, including Dhankuta, Udayapur, Siraha, Saptari, Morang, and Illam. The service became very useful for the people of remote geographical terrain with low economic strata. It made the life of the patients easy during the lockdown with the beginning of the Covid-19 outbreak in Nepal in 2020, and it became the “new normal” for patient consultation. The treatment was provided to 15–25 patients per day for three days in a week, during the lockdown period and if hospital visit was necessary, they were advised to visit nearby hospital or BPKIHS following protective measures.^[7] Data on patient management by teleconsultation is lacking in our context. The objective of the study was to identify the number of patients, the major complaints, and follow-up departments during teleconsultation.

Methods

A retrospective was conducted during March–June 2022 at Department of General Practice and Emergency Medicine (GPEM), BPKIHS. The patients who underwent teleconsultation at each faculty’s outpatient departments during March 1, 2020 to August 31, 2020, were enrolled in the study. A self-designed proforma was used to collect the relevant data after reviewing and analyzing the data of the patients. Age, gender, and residence were the independent variables.

Medium for teleconsultation, departments for teleconsultation, and follow-up schedules were the dependent variables. No personal identifying information were collected to maintain the confidentiality of the patients. Ethical approval was taken from the Institutional Review Board, BPKIHS. Data were entered in Microsoft Excel 2013. Descriptive statistics mean, frequency, and percentage were calculated using SPSS (version 11.5). The findings were presented as tables and graphs.

Results

A total of 10,901 patients were participated in the teleconsultation program. About 6,047 (55.46%) were females, and 3,363 (30.84%) belonged to the age group of 21–30 years. Majority of the patients (5,975, 54.8%) were from the Sunsari district, followed by Morang (1875, 17.2%) [Table 1].

Out of 10,904, 4,320 (39.62%) patients used Mobile phone voice call for teleconsultation, followed by WhatsApp video call (3280, 30.08%) [Figure 1].

Most of patients had complaints related to the Obstetrics and Gynecology department (1761, 16.15%), followed by Dermatology department (1570, 14.4%) and the Psychiatric department (1131, 10.37%) [Table 2].

Out of 10,904, 4,907 (45.0%) patients came for follow up through teleconsultation. A total of 876 (17.85%) patients, followed up for dermatology complaints [Figure 2].

Discussion

In the present study, it was found that the maximum number of females consulted and the maximum number of patients belonged to the age groups of 21 to 30 years. In contrast, the maximum number of patients were from age groups of 31 to 45 years in a study by Gupta *et al.*^[8] Access to healthcare can be particularly difficult for residents of rural areas, especially women. Because of prevailing societal and cultural standards that disfavor women, this is a global phenomenon. Telemedicine reduced travel time, which facilitates timely access to healthcare services

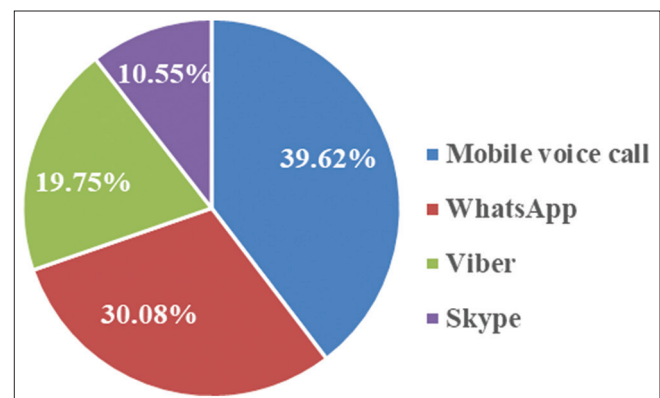


Figure 1: Medium for teleconsultation used by the patients ($n = 10,904$)

Table 1: Sociodemographic variables (n=10,904)

Variables	Frequency	Percent
Gender		
Male	4857	44.54
Female	6047	55.46
Age group (years)		
Less than one	13	0.12
1–5	363	3.33
6–10	253	2.32
11–15	156	1.43
16–20	535	4.91
21–30	3363	30.84
31–40	2778	25.48
41–50	1438	13.19
51–60	1026	9.41
61–70	544	4.99
71–80	325	2.98
81–90	101	0.93
91–100	9	0.08
Residence (District)		
Sunsari	5975	54.80
Morang	1875	17.20
Jhapa	953	8.74
Saptari	428	3.93
Dhankuta	405	3.71
Siraha	190	1.74
Udayapur	162	1.49
Bhojpur	123	1.13
Sankhuwasabha	59	0.54
Terhathum	58	0.53
Others	676	6.20
Residence (Province)		
Province 1	9694	88.90
Madhesh	863	7.91
Bagmati	182	1.67
Gandaki	59	0.54
Sudurpaschim	53	0.49
Lumbini	30	0.28
Karnali	23	0.21

Table 2: Department-wise teleconsultation (n=10,904)

Department	n	%
Obstetrics and Gynecology	1761	16.15
Dermatology	1570	14.40
Psychiatric	1131	10.37
GP and EM	1062	9.74
Orthopedics	839	7.69
Internal Medicine	765	7.02
ENT	670	6.14
Pediatrics	455	4.17
Surgery	366	3.36
Cardiology	301	2.76
Gastroenterology	287	2.63
Pulmonology	254	2.33
Dental	208	1.91
Others	1235	11.33

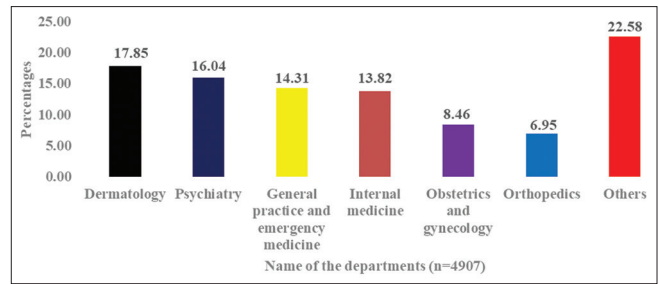


Figure 2: Department-wise follow-up (n = 4,907)

for women and girls and enhances their ability to manage their time for other tasks, such as housework.

More than one-third of the patients (39.62%) used Mobile phone voice call for teleconsultation, followed by WhatsApp video call (30.08%). The lower percentage of video call might be since internet is not available at most of the rural areas of Nepal; even if it is present, there might be poor connection. WhatsApp Messenger app is a promising system that can be a communication tool between health care professionals and patients.^[9]

The disease conditions that most of the patients presented with were obstetrics and gynecology related problems, followed by dermatological and psychiatric problems. In contrast, Gupta *et al.*^[8] found that the disease conditions that most of the patients presented were respiratory conditions, followed by dermatological and gastrointestinal problems. Women’s health, particularly expectant mothers, can make use of this resource to prevent infection. If there is no emergency, telemedicine can be used to treat gynecological diseases while the patient remains in their home. Obstetricians and gynecologists can communicate with patients, take a thorough medical history, inform them of pregnancy warning signs, offer guidance, and direct them to schedule an in-person consultation if necessary.

It has taught us the dire need of incorporation of advanced technology in health services; strengthening telemedicine, channelizing phone out patient department(OPD), online registration, and online dispatch of reports. Most importantly, the pandemic has taught us the need of due allocation of budget for the health services and health science/medical education.^[7]

Teleconsultation would be an efficient alternative to meet the escalating demands of a rapidly changing healthcare environment. It can be interactive, in future in which a healthcare professional can interact in real-time with a patient at a remote location through videoconferencing and technology-enabled medical instrumentation can also allow physical examinations, portable video units fitted with special scopes can capture images and other information; these data are then transmitted to a major medical center to facilitate diagnosis and follow-up care.^[10]

The use of telephone consultations in general practice has been shown to reduce in-person visits, according to prior research

on telehealth, this also increases patient access to care and their capacity to self-manage chronic conditions, while also drastically cutting down on the number of in-person visits that patients must make to outpatient clinics.^[11-13] According to another studies, patients select telehealth for its convenience, whereas in-person consultations are chosen because of technological barriers or personal preference.^[14] Patients' opinions of telemedicine during the COVID-19 pandemic in the United States were surveyed, and the results showed that while satisfaction with telehealth was high among both new and seasoned users, new users were more driven to stay out of waiting rooms and prevent infection.^[15] This was consistent with our study, as patient prefers mobile teleconsultation to take care of their personal health, chronic conditions, and not willing to visit OPD to prevent infections.

Conclusion

The mobile video-based telehealth service and telemedicine had positive effects on patients' disease prevention, identifying risk factors, and lifestyle. Interventions such as tele-monitoring and video teleconsultation using mobile PHR apps are appropriate for patients with poor access to healthcare during the COVID-19 pandemic. More studies are needed to demonstrate the effectiveness of interventions and if the services can be generalized.

Due to a lack of primary care delivery networks and referral pathways, secondary and tertiary care facilities' health systems used to be overworked due to pandemics. The medical services, which is greatly restricted by a shortage of health workers as well as demographic and geographic issues, can be solved by mobile telehealth and telemedicine.

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Conflicts of interest

There are no conflicts of interest.

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