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Analysis of telemedicine as a healthcare service adjunct during extended lockdown at a tertiary health care center of eastern India

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ABSTRACT

Introduction: After the recent outbreak of SARS COV2 worldwide, the governments decided to implement a lockdown to restrict or contain the spread of the contagion. Telemedicine has evolved as an adjunct/ supportive service to patients from far-off places in these troubled times. *Methodology:* A dedicated number was provided to the orthopedics department. On regular OPD, a telemedicine facility was provided from 9 am to 5 pm. On other days, the concerned duty team number was used. Patients were allowed to interact from 9 am to 11 am and 6 pm to 8 pm. *Observation and Results*: The study was conducted from March 2020 to May 2020. A total of 57 patients were given consultations through the telemedicine department out of which 41 were males, and 16 were females. Nearly 33 patients had grade 1, 16 patients had grade 2, and eight patients had grade 3 satisfaction levels. *Conclusion:* It is difficult to replace traditional consultation methods. However, telemedicine facilities may serve as useful supportive services to the existing facilities for outpatients and triage.

Keywords: Telemedicine, Patient satisfaction, Surgeon's contribution.

1. INTRODUCTION

After the recent outbreak of SARS COV2 worldwide and its high man-to-man transmission rate, governments worldwide decided for a lockdown to restrict or contain the spread (Bruce and Liang, 2020). India is also amongst those many countries to get hit by the pandemic. The health sectors are one of the many sectors that are suffering. Except for emergency services, all other services provided by the significant health centers around the country have been curtailed, and even emergency services have suffered. Initially, it was expected that the situation would come under control early, but to

everybody's surprise, the lockdown restrictions have entered into the second month. Telemedicine has evolved as an adjunct/ supportive service to outpatient services and patients from far-off places in these troubled times (Siwicki, 2020; Alhumam et al., 2020; Amin et al., 2021). Fortunately, we have a regional telemedicine facility at our institution, which was in the developing phase. This is currently being used in our hospital as a medium for interaction with patients who manage conservatively in the past and new patients handled by telemedicine facility (Ryu, 2012). Telemedicine requires the availability of digital connectivity facilities and basic technology at both ends to be adequate (Kichloo et al., 2020). Also, the patients need to be well versed in the use of technology and understand the instructions on the phone and digital platforms. Since the catchment area of our institution is primarily rural, it is a challenge to execute these services with an exceptional satisfaction level. This needs physician/ family doctor support at the local level to be more effective. Considering all these points in mind, we decided to assess the satisfaction outcomes of telemedicine services concerning orthopedics at our institute (Kumar, 2020).

2. METHODOLOGY

This was an observational study to study the effectiveness of telemedicine services. After getting clearance from the ethical committee of Institute of Medical Sciences, Banaras Hindu University (IEC no. 21/EC/2668) a dedicated telemedicine number was provided to the orthopedics department. This was circulated via print and electronic media to the masses every day for information. There was no charge for the services as it would further complicate things and will be difficult for most of the patients to manage digital payment methods. The initial purpose was to facilitate follow-up of patients operated on or managed non-operatively by concerned duty teams. But was extended to new patients who felt the problem is not severe enough to visit the hospital emergency. If the problem was deemed severe, the patient was called to the emergency department for further management, running 24 x 7 hours in any case. Also, we provided patients with a dedicated phone number of the operating team, which was mentioned on the discharge papers. Whatsapp and telephonic conversation were used to interact with the patients. Radiographs and range of motion of joints when needed were asked for on Whatsapp. Video calling was not used/ discouraged for privacy purposes. On days corresponding to regular OPD, a telemedicine facility was provided from 9 am to 5 pm. On other days, the concerned duty team number was used. Patients were allowed to interact from 9 am to 11 am and 6 pm to 8 pm. Patients were told to send their discharge papers during the first follow-up via Whatsapp and then their queries. Dressings, suture removals, and physiotherapy were advised to be done at home or local clinics. In case of any problem around the surgical site, the photo of the area was sent to us by the patients. In case of suspicion regarding infection, patients were called tothe emergency outpatient department for follow-up or coordinated with the local physician or caretaker. Patents requiring removal of external fixator were also named tothe emergency outpatient department. Patients requiring advice for continuation or stoppage of medication were duly given. Few patients who were not able to understand were advised to contact us through local doctors. Based on the above parameters, the adequacy of the Telemedicine follow-up and the subsequent satisfaction level of each patient were noted.

3. OBSERVATION AND RESULTS

The observational study was done over eight weeks from March 2020 to May 2020. A total of 57 patients were given consultations through the telemedicine department at the tertiary care center. The patient's average age was 37.75 ± 1.64 years, out of which 41 were males, and 16 were females. Among them, 33 patients were younger age group (<40 years), and 24 patients were from the older age group (>40 years). Demographic details are shown in table 1.

Table 1 Demographic details of the study participants (N=57)

Variables	Frequency (n)	Percentage (%)
Age		
Age < 40 years	33	57.89
Age > 40 years	24	42.10
Gender		
Male	41	71.92
Female	16	28.07
Educational status		
Illiterate	22	38.59
Literate	35	61.40
Follow up duration		

< 3 months	33	57.89
4-6 months	17	29.82
7-12 months	7	12.28

Out of all the calls received, 23 markets were from local/nearby places (<50km), 21 calls were from outstation (50-200 km), and 13 callers were from far-off places (>200km). The average follow-up duration was four ± 2.39 months, out of which 54 callers were operated in the past, and three were managed conservatively. Forty-six patients had sustained trauma, seven patients had spinal problems, and four patients had knee insufficiency. Thirty-five patients were educated, and 22 patients were uneducated. Patient and surgeon's satisfaction following telemedicine call was graded based on Grade 1 (less satisfied), Grade 2 (satisfied), and Grade 3 (very satisfied). Thirty-three patients had a satisfaction level of grade 1, 16 patients had a satisfaction level of grade 2, and 8 patients had a satisfaction level of grade 3. At the same time, the surgeon had a grade 1 satisfaction level in 30 patients, grade 2 satisfaction level in 22 patients, and grade 3 satisfaction level in 5 patients during the telemedicine calls (Figure 1).

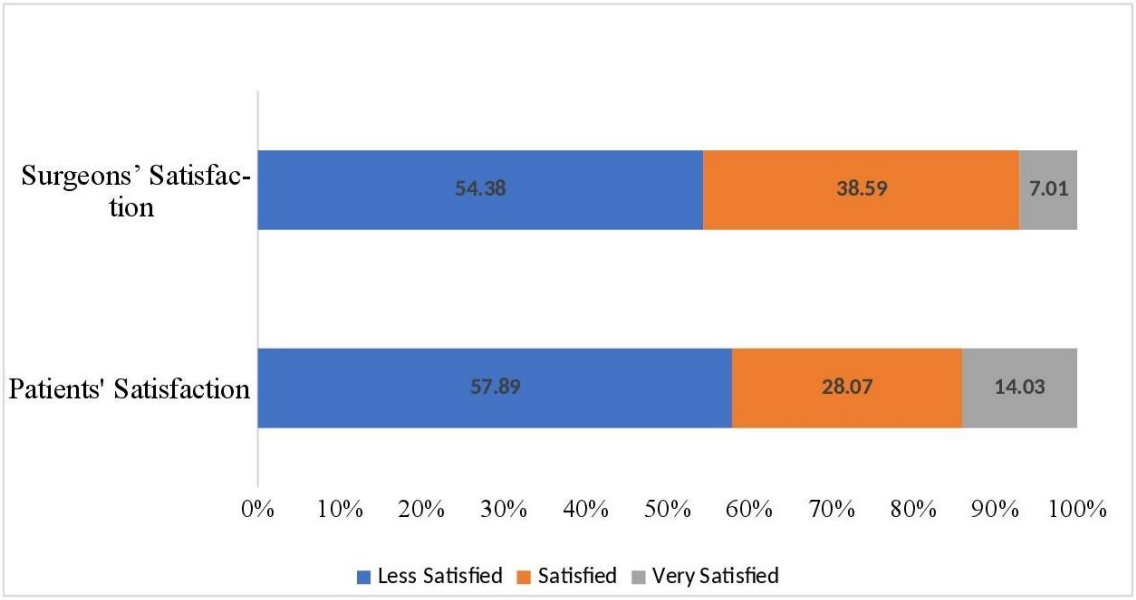

Figure 1 Stacked Bar chart showing Patient and Surgeon's satisfaction following consultation via telemedicine

On Pearson's two tailed bivariate analysis it was found out that there was significant correlation between patient satisfaction and follow up duration (r = 0.5, p = 0.0001), surgeon satisfaction and follow up duration (r = 0.28, p = 0.03) and patient satisfaction with distance from hospital (r = 0.4, p = 0.001), surgeon satisfaction with distance from hospital (r = 0.29, p = 0.02). No correlation was found among patient/ surgeon's satisfaction level with other variables like age, gender, education, diagnosis and treatment option (Table 2).

Table 2 Likert scale on Patient and Surgeon's satisfaction following consultation via telemedicine (N=57)

Variables	Less Satisfied, n (%)	Satisfied, n (%)	Very Satisfied, n (%)	Median	Interquartile range
Patient's Satisfaction	33 (57.89)	16 (28.07)	8 (14.03)	1	1-2
Surgeons' Satisfaction	31 (54.38)	22 (38.59)	4 (7.01)	1	1-2

4. DISCUSSION

The above statistics are based on a limited sample size that was collected within two months. Larger sample size may lead to more significant results; however, this study points out few essential findings. Telemedicine was just a tool used during the pandemic to help the patient in any way it could, but it could never replace outpatient services (Monaghesh, 2020). Patients and surgeons were

delighted only if the patient were from far away places or the follow-up duration was more than six months. Major operative cases were not satisfied with the Telemedicine because they wanted to meet the surgeon personally. Patients from local or nearby places thought that they could visit the doctor anytime when the doctor advised. Radiodiagnostic facilities were not available in nearby areas for most of the cases. Patients could not understand the medicines dictated by the doctors, and sometimes drugs were not available at the nearby shop. For the operated patients, in case of any problem around the surgical site, the photo of the area was sent to us by the patients. In case of suspicion regarding infection, patients were called tothe emergency outpatient department for follow-up or coordinated with the local physician or caretaker. Patients who could not follow the advice for continuation or stoppage of medication were advised to contact us through local doctors, which make networking with local doctors important. It also facilitates access to doctors for technology-savvy individuals.

Whatsapp texting, imaging, and telephonic conversation were used to interact with the patients. Radiographs and range of motion of joints when needed were asked for on Whatsapp. As such, there weren't any regulatory guidelines to be followed during telemedicine calls. The patients who were not using Whatsapp but wanted to show their progress of wound healing and even physical rehabilitation found it difficult during the telemedicine calls. Video calling was not used/ discouraged for privacy purposes. Another essential thing to look for is the average age of the patients being relatively young due to the user-friendly use of smartphones, which is somewhat tricky for older people or lower education status or lack of smartphones. The no of people taking up telemedicine calls can vary depending upon the infrastructure and the transport facilities. Furthermore, Patient and surgeon satisfaction grades following telemedicine calls give subjective assessment only and not the overall efficacy of Telemedicine.

The SARS COV2 pandemic will not wither away soon and maybe a part of our life. Telemedicine facility can be an essential adjunct to follow-up of patients with the help of technology and local physician support services (Lawton, 2021). This will surely add a new dimension to health care provision in India. It can be used to triage or filter the patients coming to the outpatient department also (Agarwal, 2021). Entertaining only referred patients from Telemedicine can also be considered to reduce the burden at higher-level health facilities. Primary patient education needs to be disseminated about telemedicine services through media. Dedicated health care networks need to be made available (Farrington, 2020).

5. CONCLUSION

Telemedicine can be adjunct to the outpatient services and triage the patients for the outpatient department for the tertiary level center. Still, it cannot replace the age-old outpatient physical consultation facilities. The facilities and infrastructure need more development and broader reach.

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Author Contributions

Sanjay Yadav: conception and design of the study, acquisition of data, analysis and interpretation of data, drafting the article, final approval;

Abhinav Anand Jha: acquisition of data, analysis, and interpretation of data, drafting the article, final approval;

Raghul Dhakshanamoorthy: interpretation of data, revising the paper, final approval; Anukritika, interpretation of data, revising the article, final approval;

Rahul Verma: acquisition of data, analysis and interpretation of data;

Neeraj Kumar Agrawal: smooth functioning of telemedicine, acquisition of data, final approval.

Ethical approval

The study was approved by the Medical Ethics Committee of the Institute of Medical Sciences, Banaras Hindu University (ethical approval code: 21/EC/2668).

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Conflict of Interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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