



Shifting to Telemedicine Practice during COVID-19 Lockdown Days: Impact on Chronic Disease Patients

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Abstract

The long lockdown and persisting fear of COVID-19 vulnerabilities of chronic disease patients had severely affected their normal treatment and physician visit cycles. This situation demanded an up rise and practice of the concept of telemedicine. The objective was to analyze the impact of telemedicine among chronic disease patients using a self-reporting numerical rating scale. A cross sectional comparative survey was designed to assess the impact of telemedicine during lockdown days among the chronic disease patients by using a patient self-reported numerical rating scale. An anonymous online questionnaire was used to obtain the patient responses. A snowball sampling strategy was adopted to recruit patients into the study. Questionnaire was disseminated through social media and the obtained responses were analyzed. A total of 299 respondents willingly took up and completed the survey questionnaire. Among the 299 patients who participated in the study, 43.84% had more than one chronic disease, of these 142 (37.17%) patients had autoimmune rheumatic diseases. All patients reported outcomes were better among patients who utilized the telemedicine service than patients who did not had access to the same. The patient reported outcomes related to the overall well-being of the patients in the telemedicine group were 6.515 ± 2.472 . The patients who had no access to the telemedicine services reported to have overall well-being score of 7.166 ± 2.548 . Telemedicine is one of the best available to promote health care and the practice of telemedicine was also associated with better patient reported outcomes and quality of life.

Keywords: Telemedicine; COVID-19; Chronic disease; Lockdown

Introduction

World Health Organization (WHO) declared the novel Coronavirus Disease (COVID-19) as a pandemic on the 11th of March 2020 [1]. India had its index case reported on the 30th of January in the state of Kerala [2]. India was one among the countries in the world to declare the longest lockdown across the nation in order to resist the spread of COVID-19. Till date India completed four phases of nationwide lockdown of which phase-1 being initiated on March 25th, 2020 [3]. It was imperative to control the total patient numbers reaching the hospitals. The limited transportation facilities due to lockdown also reduced the patient access to their hospitals. The long lockdown and persisting fear of COVID-19 vulnerabilities of chronic disease patients had severely affected their normal treatment and physician visit cycles. These conditions had led the entire medical fraternity to explore the opportunities of telemedicine for providing uninterrupted medical care to chronic disease patients. There are reports that many of the chronic disease care units have initiated the usage of telemedicine using social media platforms [4]. Hence it was important to analyze and confirm the positive aspects of switching to telemedicine. So we analyzed the impact of telemedicine among chronic disease patients using a self-reporting numerical rating scale.

Materials and Methods

Settings and participants

We adopted a cross sectional comparative survey design to assess the impact of telemedicine during lockdown days among the chronic disease patients by using a patient self-reported numerical rating scale. We used an anonymous online questionnaire to obtain the patient responses. A snowball sampling strategy was adopted to recruit patients into the study. The target population was the chronic disease patients living in the state of Kerala. The online survey was first disseminated among the students of Nirmala College of Pharmacy, Muvattupuzha and to the patients of a Rheumatology Center in the area *via* social media. As the Indian Government strictly wanted their citizens to minimize the social contact and to remain in their homes, potential respondents were

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Table 1: Comparisons of socio-demographic factors and NRS questions.

Socio-demographic characteristics	Options for respondents	Patients who accessed telemedicine (n=169)	Patients who didn't accessed telemedicine (n=130)	P value (2-tailed test)
Age (Mean ± SD)		49.893 ± 14.544	58.031 ± 16.996	0
Gender	Female (n=193)	111 (65.68%)	82 (63.07%)	0.641
	Male (n=106)	58 (34.31%)	48 (36.92%)	
Educational Background	High School (n=118)	41	75	0
	Undergraduate (n=111)	73	38	
	Post graduate (n=64)	50	14	
	Doctor of Philosophy (n=8)	5	3	
Numerical Rating Scale (0-not worried or satisfactory , 10-worried or not satisfactory)				
Reduced access to health care services (Mean ± SD)		4.414 ± 3.241	4.577 ± 3.064	0.65
Concerns regarding the medicines they use in COVID-19 season (Mean ± SD)		3.521 ± 2.984	4.192 ± 2.748	0.047
Concerns regarding acquiring COVID-19 (Mean ± SD. Dev)		2.351 ± 1.351	2.562 ± 1.311	0.199
Overall wellbeing during lockdown (Mean ± SD. Dev)		6.515 ± 2.472	7.166 ± 2.548	0.027

electronically invited to take up the survey. The questionnaire was prepared in English using Google forms. Language assistance and queries of the participants were attended and clarified on phone via the telephone number provided along with the request message attached with the Google form link circulated in different social Medias. All respondents attended the electronic informed consent.

Study development

The survey questionnaire consisted of 11 questions. Socio-demographic factors obtained included age (1), gender (2), educational background (3), chronic disease (4), the sector of hospital they approach (Government/Private) (5). The respondents were asked on their included the accessibility to telemedicine (6). The health conditions and health concerns were evaluated with a set of dichotomous questions and Numerical Rating Scales (NRS). The numerical rating scales ranged from 0 to 10. In this 0 denoted 'not worried or satisfactory' and 10 on scales denoted 'worried or not satisfactory'. NRS questions were evaluated to rate their concerns on reduced access to health care during the lockdown days (7), considerations about the safety of the medicines they were consuming during the lockdown period (8) and their concerns about acquiring COVID-19 infections because of their chronic disease state (9) and their overall wellbeing during this lockdown (10).

Patient reported outcomes

The patient reported outcomes were mainly assessed using the NRS scales. It covered the patient concerns regarding the limited access to health care services during the lockdown, safety of medicines they are consuming, acquiring COVID-19 infection because of their chronic disease and their overall wellbeing during this lockdowns. All these patients reported outcomes were compared between the 2 study groups namely patients who adopted telemedicine and patients who did not.

Statistical analysis

Descriptive statistics were calculated for age and NRS questions. Chi-square test was used to analyze the association between the categorical variables. We used t-test to analyze the age and for NRS questions in both disease groups. All test were two-tailed, with level of significance, $p < 0.05$. Statistical analysis was performed using SPSS statistics 21.0 (IBM SPSS Statistics, New York, United States).

Results

A total of 299 respondents willingly took up and completed the survey questionnaire. Among them about 169 (56.52%) had access to telemedicine, whereas 130 (43.47%) of them didn't had the opportunity to utilize the telemedicine service. All study relevant parameters like distribution of age, gender, educational status, NRS based patient reported outcomes regarding their health and health concerns during the COVID-19 lockdown were analyzed.

Among the 299 patients who participated in the study, 43.84% had more than one chronic disease, of these 142 (37.17%) patients had autoimmune rheumatic diseases, 114 (29.84%) had life style and endocrine disorders like diabetes, hypertension, dyslipidemia, thyroid disorders, 58 (15.18%) patients had cardiac disorders, 34 (8.90%) patients had respiratory diseases, 24 (6.28%) patients had gastrointestinal disorders and 10 (2.61%) had malignancy (Table 1).

The mean age of the patients who utilized the telemedicine services were 49.893 ± 14.544 and the mean age of the patients who did not attended the telemedicine services were 58.031 ± 16.996 ($p < 0.05$), which was higher than the mean age of the telemedicine utilized study group. A female dominance was observed in both chronic disease groups (group 1 vs. group 2). Both study groups had an equal distribution of female with 111 (65.68%) in the telemedicine group and 82 (63.07%) in non-telemedicine study group ($p > 0.05$). The educational background of patients were assessed and it was found that patients with higher educational status were in the telemedicine group ($p < 0.05$). The patient reported outcomes were assessed using NRS scales. All patients reported outcomes were better among patients who utilized the telemedicine service than patients who did not had access to the same. The concerns regarding the medicines they use for the management of their chronic disease during the COVID-19 struck days were higher in the patients who didn't had access to the telemedicine facility (4.192 ± 2.748 vs. 3.521 ± 2.984 ; $p < 0.05$). The patient reported outcomes related to the overall well-being of the patients in the telemedicine group were 6.515 ± 2.472 . In contrary to this, the patients who had no access to the telemedicine services reported to have overall well being score of 7.166 ± 2.548 . The overall well being of the patients in the telemedicine group was found to have positive outcomes when compared with the other group ($p < 0.05$).

Discussion

Indian Medical Association (IMA) had officially formulated and published guidelines for practice of telemedicine in India. These guidelines were notified under the Indian Medical Council (Professional Conduct, Etiquette, and Ethics) Regulations, 2002 [5]. This accelerated action of the IMA is attributed to the nationwide lockdown that was declared on March 5th, 2020 to reduce the patient flow into the hospitals and to maintain the continuous medical accessibility for all patients to meet their medical needs. In accordance with these the entire medical fraternity of India switched their consultations into the online telemedicine to serve their patients [6]. The private and the government hospitals of Kerala were equipped to treat their patients with online telemedicine under the E-Sanjeevani for non-COVID patient care [7]. Thus Kerala was one of the leading states in the nation that extended their health care systems with the use of telemedicine. The positive impact of medical care with telemedicine can be attributed to Kerala's internet penetration which is reported to be the second highest in the nation [8]. But ultimately the impact of telemedicine has to be assessed based on the patient reported outcomes. Hence we conducted a comparative cross sectional survey to record and analyze patient reported outcomes on numerical rating scale among patients who chose to use telemedicine consultations and who did not had access to the same. Of the 299 patients who participated in our study, 169 (56.52%) consulted through telemedicine whereas 130 (43.47%) did not had access for using telemedicine for the treatment of their chronic diseases. The younger age and high educational status of the patients in the telemedicine group supported the hypothesis that respondents with higher e-Health literacy would be younger and more educated [9]. Analysis of the patient reported outcomes clearly showed positive responses from the patients who attended the telemedicine consultations. Concerns about the safety of medicines they use were much less in the telemedicine group. The safety concerns of many treatment agents like ACE inhibitors, Hydroxychloroquine etc used for the treatment of different chronic diseases where stipulated in the Medias, that they bear an additional risk for being infected with COVID-19 and were associated with several life threatening adverse effects [10,11]. Telemedicine had played an important role in improving the health literacy of the chronic disease patients. Thus telemedicine had improved the confidence of the patients about the safety of their medicines and encouraged them to be completely Adherent to their regular medicines. Medication adherence is a key factor associated with anticipated outcomes in chronic diseases. But inadequate health literacy can result in medication non-adherence and poor health outcomes [12]. The telemedicine group also reported to have better overall well-being compared to the other study group during the lockdown period. The overall well-being also reflected their better quality of life. Mental and physical stress experienced by chronic disease patients is profound factors that determine their quality of life [13]. The limited physical activity and social involvement during the long lockdown days are inversely related to the physical and mental stress experienced by a patient [14]. This had significantly increased the number of suicide in India which claimed over 300 deaths being reported during these lockdown phase. This incidence itself can explain the impact of psychological stress persisting over the Indian population [15]. The fact that increased stress and health related quality of life can have a negative impact on the disease severity addresses the urgent need of medical attention for the chronic disease patients [16,17]. Thus the better overall well-being

score observed among the telemedicine group proved to be a health intervention that can be adopted in order to identify the uncertainties and to offer medical assistance whenever needed.

Telemedicine can be utilized in an efficient way to tackle the short comings of medical emergencies or pandemic that demands the reduction in patient inflow to the hospitals. The implementation of telemedicine can also be considered as an economically viable health intervention to meet the health demands of chronic disease patients during the lockdown. Many past researches had demonstrated better cost utility and cost effective models for telemedicine in comparison with the standard health care visits [18]. The reduced cost of telemedicine may be due to the reduction in indirect medical cost and better incremental net monetary benefit when compared to the conventional health care visits [19].

Kerala's COVID-19 statistics is one of the best performers in India [20]. The implementation of telemedicine reduced the chronic disease patients inflow to the hospitals and reduced the risk of COVID-19 infections among these vulnerable populations [21,22]. Although more health care workers were infected with COVID-19 and hospitals turning out to be the epicenter of COVID-19 transmission in Kerala [23], the state managed to maintain its COVID-19 cases low and under control with the execution of pre planned health services like telemedicine.

But it should be noted that even in our study 130 (43.47%) patients had no access to telemedicine. We have to explore methods to expand this facility even to the marginalized communities of the state or else we may witness a digitally divided health scenario [24].

Conclusion

Our study concluded that telemedicine is one among the best available alternative to overcome the current COVID-19 conditions which demands controlled or reduced patient inflow to the hospital. Practice of telemedicine was also associated with better patient reported outcomes and quality of life. But before implementations of such health care interventions keen efforts have to be made in order to avoid any chances of evolution of a digitally divided health policy standard.

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