World Journal of Pharmaceutical Sciences
ISSN (Print): 2321-3310; ISSN (Online): 2321-3086
Available online at: http://www.wjpsonline.org/
Review Article

Telemedicine in health care setting: A review

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Received: 10-11-2020 / Revised Accepted: 29-11-2020 / Published: 30-11-2020

ABSTRACT

Introduction: Telemedicine is defined as clinical practice for diagnosis, review and management through synchronous or asynchronous way and through telecommunication. It signifies the use of Information and Communication Technologies (ICT) to improve patient outcome by increasing access to care and medical information and helps to provide timely information and consultation to patients in remote areas. Telemedicine make use of electronic communication mainly video conferencing. It is used as a tool for improving healthcare in future which promotes Health Care Providers (HCP)- patient interaction.
Methodology: Various articles were reviewed to measure the views of both patients as well as physicians towards telemedicine.
Observation: Advantages of telemedicine include avoidance of travelling. Thus, it lowers expenses, provides convenience and reduces the number of hospital stay. Telemedicine programs are used in the area of psychology, dermatology, radiology, etc. but disappointingly it had to be limited due to the lack of staffs. It plays an important role in ensuring regular medical advices to patients with chronic ailments mainly in developing countries. Majority poses positive views regarding telemedicine services but most of the people are unable to accept diversion from face to face interaction and poses a misbelief that use of artificial intelligence (AI) in the field of health care is not as effective as traditional method.

Keywords: Telemedicine, Health Care Providers, Chronic ailments, Remote areas, Artificial intelligence.

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How to Cite this Article: Gowri Parvathy S.R, Chitra C. Nair, Asheeta A, Hima C.S, Beena M.I. Telemedicine in health care setting: A review. World J Pharm Sci 2020; 8(12): 118-121.

INTRODUCTION

Telemedicine literally means "healing at a distance", which make use of ICT to improve patient outcomes by increasing access to medical information and care[1] and significant in future health care. There are three main types of telemedicine services, namely store and forward, remote monitoring, real-time interaction. Store-and-forward telemedicine outdo the need for medical practitioners to meet in person with a patient. Data such as medical images can be sent to physicians or specialists if needed through electronic devices. Remote monitoring uses a range of technological devices to assess patient's health status. Interactive services can provide immediate advice to patients who require medical attention through phone calls and online platforms [2].

In tele-rehabilitation, the patient is given advice and therapy on rehabilitation. In telepharmacy, the patient is given advice on pharmaceutical aspects. Telenursing makes use of nursing services. Some believe that telemedicine is not as effective as traditional face to face interaction but telepsychiatry and telepsychology applications are well-accepted by patients and providers and poses similar effects as that of physical consultation [3]. Telemedicine is defined as the use of technology by a medical professional to diagnose and treat patients in remote location. Patients enjoy benefits of less travel time and expense, privacy, reduced exposure to other patients [4]. Majority assume that tele-health and telemedicine are same. But when we look deeper, telemedicine includes remote clinical service while telehealth deals with non-clinical services. Tele-medicine makes use of electronic communication. It is used as a tool for improving healthcare in future which promotes HCP- patient interaction [5].

When assessing the role and acceptance of tele-medicine during a situation of pandemic like COVID-19, social distancing is a must. There is no need for the patients to visit hospitals in such situations for consulting their physician, still they can obtain advice from HCPs regarding acute and chronic illnesses without social interaction. Mainly neurosurgery department is utilising telemedicine opportunities in a wide manner when compared to other departments [6]. Telemedicine not only creates and helps in patient- physician interaction but also interactions among HCPs during surgeries or during an emergency condition, which in turn improve patient's health outcome. Even these benefits sticks along with telemedicine, still many hospitals haven't adopted this method. This can also be due to some common misbelief among people that telemedicine will not be as effective alternative as traditional face to face interactions. The objective of the review is to assess the importance of telemedicine in healthcare settings and the advantages of telemedicine during COVID-19 scenario.

MATERIALS AND METHODS

A literature study was carried out to assess the efficacy and acceptance of telemedicine in health care. Various articles were reviewed to measure the views of both patients as well as physicians towards telemedicine.

DISCUSSION

Telemedicine has been influenced by investment in equipment and organisation of health services. It faces various challenges such as changes in technology, its accessibility among patients, etc[7] .In US, more than quarter of patient-HCP interaction is made through telephone calls[8]. In a study by Sao Paulo, telemedicine impact on various diseases has been assessed. It was found out that in asthma there is no difference in outcome between telemonitoring and usual monitoring patients. In case of patients with COPD, exacerbations and hospitals admissions were reported to be lower among telemonitored patients. Telemonitoring have lower impact on outcome among patients suffering from multiple sclerosis[5]. When assessing stroke cases, face to face interactions have done through video conferencing which included training for upper and lower limb, mobility training which doesn't show a significant outcome and its same in the cases of HIV infected patients. There was a significant outcome through telemonitoring in patients with heart failure. Telemonitoring also reduced mortality and hospitalisation. Various types of pain relieved to an extent through telemedicine consultation.

Study in Norway suggests that, many telemedicine programs are there in the area of psychology, dermatology, radiology, etc but disappointingly it had to be limited due to the lack of staffs. The study concluded that the use of telemedicine declined over 2009-2010 then inclined during 2011. Out of 28 hospitals, 20 make use of telemedicine [6]. Here the platform for telemedicine was mainly video conferencing. Most telemedicine included video conferencing while rest utilised asynchronous methods like e-mails[6,9].Table-1 shows various departments and their mode of telemedicine i.e., whether asynchronous or synchronous.

In case of telemedicine for home care settings, advice for wound dressing and treatment, services for patients with pacemaker, foot ulcer care are done by sending pictures to physicians electronically. Psychiatry, surgery, dermatology departments depend on telemedicine where digital

images were transmitted and specialised opinions were obtained. Even when large hospitals use telemedicine routinely, its overall usage is still low. It comprises of only 1% of face to face patient visits. Assessment method in telemedicine for various departments is given in table-2.

Telemedicine helps to provide timely information and consultation to patients in remote areas[10]. Assessing a study regarding telemedicine efficacy during COVID-19, by Muhammad Abdul Kadir, it plays an important role in ensuring regular medical advices to patients with chronic ailments mainly in developing countries. Mobility restrictions and social distancing are obligatory during pandemic which paved a way for vast telemedicine consultation. It assures no spreading of infection from asymptomatic HCPs during consultation. It also helps in reducing Personal protection equipment (PPE) kits for patients which can be utilised by HCPs. PPE kit scarcity is faced by low resource countries. In case, if HCPs are tested positive for COVID-19 and are on quarantine, their valuable time can be utilised by patients through telemedicine consultation[9]. Majority of population suffer from mental stress due to COVID-19 but a very few undergo consultation due to the fear of infection which can be overcome by tele-psychiatric consultation[11].

Assessing the acceptance and knowledge of telemedicine among HCPs in Austrian Healthcare sector, they are using telemedicine[12] but not yet fully developed due to funding problems[13,14]. HCPs were reported to have knowledge on telemedicine but a doubt exist about efficacy of disease monitoring, doctor-patient interaction, reliability of information provided (8.3%) and even data privacy (11.9%) [15]. Majority, about 80% of Austrian population have access to internet, which can be utilised in telemedicine platform but ethical considerations need to be considered before setting up such services to avoid scepticism that arise among patients.

Looking into the advantages of telemedicine, avoiding travel leads to reduced expenses. Around 70% patients find it more convenient[6] and reduced number of days of hospital stay. Telemedicine is reported to be a cost-effective method of patient care in Britain[16]. Cost effectiveness of telemedicine depends on the aspects of individual to whom the service is being provided. Important point is that telemedicine is an effective method of patient care for immobile patients and also during pandemic conditions, where staying at home was made mandatory. Even when it withholds these benefits, some factors retreat its implementation. This includes lack of connectivity, equipment with common people, equipment cost and miscommunication errors. Mainly, people backout of telemedicine services due to trust issues, which can be subdued by certification and standard procedures[17]. Lack of information and knowledge about telemedicine among people is also a contributing factor. HCPs are the gatekeeper of Telemonitoring Service System (TSS), so their knowledge and acceptance also need to be measured. Some believed that telemedicine would ruin traditional physician-patient interaction.

CONCLUSION

In most cases, especially respiratory disease conditions, telemedicine have a greater impact in reducing hospital visit, reducing mortality rate in case of patients with heart failure and improving mental health among people during pandemic outbreak. Neurology and psychiatry departments utilise telemedicine more. It not only includes improved physician-patient interaction, but also in some cases expertise opinion can be obtained from physicians on the other part of the world on cases of surgery. Majority poses positive views regarding telemedicine services. Most of the people are unable to accept diversion from face to face interaction.

In advanced telemedicine, not only manual knowledge but also artificial intelligence and computer aided diagnosis are involved[18,19]. Some find it not as effective as physical consultation. Lack of information about this can lead to mistrust and also prone to miscommunications sometimes.

Acknowledgement: The authors are grateful to the management and staff of Ezhuthachan College of Pharmaceutical Sciences for their support.

Conflict of interest: The authors declared no conflict of interest with respect to the authorship, research or publication of the article.

Table 1: Departments and their mode of telemedicine

Asynchronous	Cardiology, pathology, dermatology
Synchronous	Oncology, psychiatry, nephrology, orthopaedics, neurology, pulmonary
Both	Gynaecology, Emergency medicine, surgery

Table 2: Assessment methods in telemedicine for various departments

DEPARTMENT	ASSESSMENT METHOD
CARDIOLOGY	ECG& coronary angiography
PULMONARY	CT& lung function
ONCOLOGY	Chemo treatment, radiotherapy
GYNAECOLOGY	Pre-operative assessment
PATHOLOGY	Kidney biopsy
NEUROLOGY	Thrombolysis
NEPHROLOGY	Tele dialysis

REFERENCES

1. Telemedicine Opportunities and developments in Member States- World Health Organisation. https://www.who.int/goe/publications/goe_telemedicine_2010.pdf(Accessed October 1,2020)
2. Types of Telemedicine. https://www.news-medical.net/health/Types-of-Telemedicine.aspx(Accessed October 2,2020)
3. Cullum et al. Teleneuropsychology: evidence for teleconference-based neuropsychological assessment, J Int Neuropsychol Soc. 2014;20(10):1028-33.
4. What is Telemedicine.https://chironhealth.com/telemedicine/what-is-telemedicine/ (Accessed September 27,2020)
5. Flumignan CDQ et al. What do Cochrane systematic reviews say about telemedicine for healthcare? Sao Paulo Med. J. 2019; 137(2).
6. Zanaboni P. Adoption of routine telemedicine in Norway: the current picture, Global Health Action.2014; 7(1).
7. Hailey DM. Assessing the Economic Impact of Telemedicine, Disease Management and Health Outcomes. 2012; 7:187-192
8. Vaona A et al. Training interventions for improving telephone consultation skills in clinicians. Cochrane Database Syst Rev. 2017;1(1):CD010034.
9. Kadir M. Role of telemedicine in healthcare during COVID-19 pandemic in developing countries, Telehealth and Medicine Today 2020;5(2):1-5.
10. Rezende EJ et al. Ethics and eHealth: reflections for a safe practice. Rev Panam Salud Publica. 2010;28(1):58-65.
11. Bashshur RL et al. The empirical evidence for telemedicine interventions in mental disorders. Telemedicine and e-Health. 2016;22(2):87–113.
12. Statistik Austria Survey on ICT usage in households and by individuals http://www.statistik.at/web_en/statistics/EnergyEnvironmentInnovationMobility/information_society/index.html (Accessed September 28,2020).
13. Hofmarcher MM, Quentin W. Austria: health system review. Health Syst Transit. 2013;15(7):1-292.
14. Muigg D et al. Is Austria Ready for Telemonitoring? A Readiness Assessment Among Doctors and Patients in the Field of Diabetes. Stud Health Technol Inform. 2018; 248:322-329.
15. Wernhart A et al. eHealth and telemedicine: Practices and beliefs among healthcare professionals and medical students at a medical university. PLoS One. 2019;14(2): e0213067.
16. Whitten PS et al. Systematic review of cost effectiveness studies of telemedicine interventions. BMJ. 2002; 324(7351):1434-7.
17. Design and validation of a questionnaire to measure the acceptance of telemedicine by healthcare professionals in Germany. Research Square 2020 https://doi.org/10.21203/rs.3.rs-60425/v1
18. Chowdhury ME et al. Can AI help in screening viral and COVID-19 pneumonia? IEEE Access. 2020; 8:132665–676.
19. Rahman Tet al. Transfer learning with deep Convolutional Neural Network (CNN) for pneumonia detection using chest X-ray. Applied Sciences. 2020;10(9):3233.