**Name of Journal:** *World Journal of Clinical Cases*

**Manuscript NO:** 55923

**Manuscript Type:** OPINION REVIEW

**Continuity of cancer care in the era of COVID-19 pandemic: Role of social media in low- and middle-income countries**

Yadav SK *et al*. Social media in the era of COVID-19

Sanjay Kumar Yadav, Nishtha Yadav

**Sanjay Kumar Yadav,** Department of Surgery, Netaji Subhash Chandra Bose Medical College, Jabalpur 482003, Madhya Pradesh, India

**Nishtha Yadav,** Department of Radiology, Super-specialty Hospital, Netaji Subhash Chandra Bose Medical College, Jabalpur 482003, Madhya Pradesh, India

**Author contributions:** Yadav SK contributed to study design, literature search, writing, and proofreading; Yadav N contributed to literature search, writing, and proofreading.

**Corresponding author: Sanjay Kumar Yadav, MBBS, MCh, MS, Assistant Professor,** Department of Surgery, Netaji Subhash Chandra Bose Medical College, Tilwara Road, Jabalpur 482003, Madhya Pradesh, India. sky1508@gmail.com

**Received:** April 10, 2020

**Revised:** November 22, 2020

**Accepted:** December 6, 2020

**Published online:**

**Abstract**

A novel coronavirus (severe acute respiratory syndrome coronavirus 2) first detected in Wuhan, China, has spread rapidly since December 2019, causing more than 1.4 million confirmed infections and 15000 fatalities (as of April 9, 2020). The outbreak was declared a pandemic by the World Health Organization on March 11, 2020. Isolation, quarantine, social distancing, and community containment measures were rapidly implemented in China, which helped in containing the disease. However, other low- and middle-income countries lack such extensive infrastructural capacities and resources. Cancer patients are particularly at high risk of infection and mortality due to immunosuppression. Hence self-quarantine is recommended for them. Additionally, it is becoming impossible to maintain the continuity of care when cancer patients have to avoid physical visits. Social media applications, *e.g.,* Facebook and WhatsApp, can provide educational group program and psychosocial support to these patients while maintain social distancing. We have analyzed their use in this review article and how it could change the follow-up of cancer patients during this pandemic.

**Key Words:** COVID-19; Telemedicine; Cancer care; Social media; Low- and middle-income countries; Remote monitoring

Yadav SK, Yadav N. Continuity of cancer care in the era of COVID-19 pandemic: Role of social media in low- and middle-income countries. *World J Clin Cases* 2020; In press

**Core Tip:** Social media is an effective modality in remote monitoring of cancer patients. While using social media, platforms that have end-to-end encryption (*e.g.,* WhatsApp) should be preferred over open platforms (*e.g.,* Facebook). It is recommended to use a single smart phone that should have multiple security mechanisms so that only the clinician can open the social media platform. It is always a good practice to transfer the patient data to a secure hard drive on a regular basis and then delete it from the smart phone.

**INTRODUCTION**

A novel corona virus disease 2019 (COVID-19) outbreak was first detected in Wuhan, China in December 2019[1,2]. Subsequently, it has spread globally, and the World Health Organization has declared it a pandemic[3]. The World Health Organization reported on April 7, 2020 that globally 1.4 millions are infected, and 15000 persons have died due to COVID-19. This data illustrates the gravity of this disease, which has no vaccine as of now. Without any proven cure and vaccine, the World Health Organization has advised infection prevention as the only proven method to control the pandemic[4]. More and more countries have announced lockdowns and closed schools and bans on mass gatherings, cinema halls, shopping complexes and factories to prevent the infection. Trains and the aviation sector have also been closed in many countries including India. The biggest challenge for patients with cancer is the inability to access required clinical appointments, traveling to the hospital, and admission and discharge without getting infected. This has impacted the care of cancer patients as collateral damage. Herein we have reviewed the use of social media platforms and how they can overcome the difficulty of physical visits in these times.

**DEADLY DUOS: CANCER AND COVID-19**

Cancer and COVID-19 form a deadly duo associated with higher mortality. Liang *et al*[5] reported that cancer patients had higher morbidity and mortality. The frequency of severe events was 39% in cancer patients *vs* 8% in other patients (*P* = 0.0003). Similarly, cancer patients who had received chemotherapy or had undergone surgery recently were at a greater risk of clinically severe events than patients who had not (75% *vs* 43%, respectively; odds ratio = 5.34, *P* = 0.0026). Higher adverse events in cancer patients is due to an immunocompromised state.

**LATEST BARRIER IN CANCER CARE: COVID-19**

Low- and middle-income countries (LMICs) have high mortality related to cancer. Cost of transportation and treatment, failure of the primary health care provider to recognize the possibility of cancer, and illiteracy are a few major barriers in delivery of cancer care in LMICs[6]. With the emergence of COVID-19, another barrier has been added to it. Along with social distancing, many countries have ordered lockdowns. More than a third of the planet’s population is under some form of restriction. The world’s two most populous countries are India and China. While China is an upper middle-class country, India (population of 1.3 billion) is the largest LMIC to declare a lockdown on March 24, 2020. Many other LMICs have restricted their public transportation to prevent further transmission of COVID-19. The challenges faced by cancer patients due to COVID-19 are numerous. Cancer patients undergoing chemotherapy need regular monitoring of their white blood cell counts, and in the case of neutropenia they need treatment. Patients who have completed their treatment need to visit the hospital for physical check-ups and investigations. All of this is difficult to accomplish due to restrictions.

**RISE OF 4G AND SOCIAL MEDIA IN LMICs**

With the advent of 4G technology, more of the global population is using the internet and social media. A survey[7] stated that 19 emerging and developing economies had a substantial increase in internet connectivity. Between 2013 and 2014, a median of 42% across these countries said they accessed the internet at least occasionally or owned a smartphone. By 2017, a median of 64% were online. Social media use has also increased in emerging markets. In 2015-2016, roughly 40% of adults across the emerging nations surveyed said they used social networking sites. As of 2017, 53% used social media. This has created a unique opportunity for health care services in these LMICs.

**CONVENTIONAL TELEMEDICINE VIS-À-VIS SOCIAL MEDIA**

Hospital based telemedicine systems are already being used to carry out continuity of care after primary treatment is over and are being used in both developed countries and LMICs[8-11]. Although, financially less costly in comparison to conventional follow-up, telemedicine requires equipment and prior appointments. The physical presence of the patient is also needed at a nearby telemedicine center. Social media can provide continuity of care without any physical visit. This is where social media can fill the gap by providing continuity of care without any physical visit. This is a form of consultation at leisure where both physician and patient remain within the confines of their homes. However, a major issue with this form of consultation is the issue of privacy.

**PRIVACY ISSUES**

General Data Protection Regulation requires businesses to protect the personal data and privacy of European Union citizens for transactions that occur within European Union member states. The HITECH Act in North America is a similar type of regulation. These types of regulations do not existent in most LMICs. India is planning to introduce the Digital Information Security in Healthcare Act to protect the privacy of healthcare data.

The COVID-19 pandemic has changed the mindset of authorities making these regulations, and now many countries are relaxing their regulations. India introduced telemedicine guidelines on March 25, 2020, and a clinician may use any telemedicine tool suitable for carrying out technology-based patient consultation (*e.g.,* telephone, video) connected over LAN, WAN, internet, mobile or landline phones, chat platforms like WhatsApp, Facebook Messenger *etc.*, mobile apps, or internet based digital platforms for telemedicine or data transmission systems like Skype/email/fax, *etc*.[12] In my opinion, more LMICs should relax their norms for telemedicine practice so that clinicians can provide required services over social media.

WhatsApp can be used because the platform is encrypted, which ensures privacy between the doctor and the patient. No one, not even a WhatsApp employee, can access the information except for the sender and recipient. All the images received may be transferred to a secure hard drive regularly and data from the smart phone can be deleted permanently. This may solve privacy concerns.

**SOCIAL MEDIA IN REMOTE MONITORING OF CANCER PATIENTS**

A trial of a social media application (WhatsApp) for remote monitoring of cancer patients was studied in India by the author[13]. Sixty-four differentiated thyroid cancer patients were studied in this trial: 24 were followed up conventionally and 40 *via* social media. There were no significant differences between these two groups regarding satisfaction. More patients in the social media group were “very satisfied.” Wound evaluation through remote follow-up was on par with outpatient department follow-up. If all of these 40 patients would have come to our outpatient department follow-up, they would have traveled an average of 930 km per patient.

Eng *et al*[14] reported that among 371 cancer survivors, 74% used the internet and 39% used social media for cancer care; 48% felt confident in using online information for cancer-care decisions. Young adults were more likely to use social media for cancer-care [odds ratio = 1.79 (1.08-2.99), *P* = 0.03]. A review of the available literature on breast cancer survivors using social media concluded that it is a positive experience[15]. Multiple studies have now proven the effective role of social media in cancer care. Han *et al*[16] reviewed 18 studies, seven of which were randomized controlled trials. Most studies were conducted for all types of cancer, and some were conducted for breast cancer in the United States with mostly white female participants. Facebook was the most frequently used platform. Most studies targeted healthy participants providing cancer prevention education. They concluded that the use of social media platforms, either as a part of a larger intervention or as the main component of an intervention, was feasible and showed a significant improvement in cancer prevention and management.

**CONCLUSION**

The COVID-19 pandemic has changed the global landscape of telemedicine, and most governments have relaxed the norms for conducting telemedicine. Social media can be an effective tool in LMICs in remote monitoring of cancer patients due to the increased availability of smartphones and 4G data connectivity. This is particularly suitable for monitoring patients with less aggressive cancers like breast cancer, thyroid cancer, *etc.* However, there is limited evidence on long term outcomes. Safety and reliability of social media applications to deliver remote cancer follow-up needs further studies.

**REFERENCES**

1 **Wang D,** Hu B, Hu C, Zhu F, Liu X, Zhang J, Wang B, Xiang H, Cheng Z, Xiong Y, Zhao Y, Li Y, Wang X, Peng Z. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China. *JAMA* 2020; **323**: 1061-1069 [PMID: 32031570 DOI: 10.1001/jama.2020.1585]

2 **Holshue ML,** DeBolt C, Lindquist S, Lofy KH, Wiesman J, Bruce H, Spitters C, Ericson K, Wilkerson S, Tural A, Diaz G, Cohn A, Fox L, Patel A, Gerber SI, Kim L, Tong S, Lu X, Lindstrom S, Pallansch MA, Weldon WC, Biggs HM, Uyeki TM, Pillai SK; Washington State 2019-nCoV Case Investigation Team. First Case of 2019 Novel Coronavirus in the United States. *N Engl J Med* 2020; **382**: 929-936 [PMID: 32004427 DOI: 10.1056/NEJMoa2001191]

3 **World Health Organization.** Virtual press conference on COVID-19 - 11 March 2020. Available from https://www.who.int/docs/default-source/coronaviruse/transcripts/who-audio-emergencies-coronavirus-press-conference-full-and-final-11mar2020.pdf?sfvrsn=cb432bb3\_2

4 **World Health Organization.** Situation report - 07 April 2020. Available from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200407-sitrep-78-covid-19.pdf?sfvrsn=bc43e1b\_2

5 **Liang W,** Guan W, Chen R, Wang W, Li J, Xu K, Li C, Ai Q, Lu W, Liang H, Li S, He J. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *Lancet Oncol* 2020; **21**: 335-337 [PMID: 32066541 DOI: 10.1016/S1470-2045(20)30096-6]

6 **World Health Organization.** Cancer control: knowledge into action. WHO guide for effective programs. Available from http://www.who.int/cancer/modules/en/

7 Pew research center on global attitudes and trends. Available from https://www.pewresearch.org/global/2018/06/19/social-media-use-continues-to-rise-in-developing-countries-but-plateaus-across-developed-ones/

8 **Mishra A,** Kapoor L, Mishra SK. Post-operative care through tele-follow up visits in patients undergoing thyroidectomy and parathyroidectomy in a resource-constrained environment. *J Telemed Telecare* 2009; **15**: 73-76 [PMID: 19246606 DOI: 10.1258/jtt.2008.080808]

9 **Weinerman B,** den Duyf J, Hughes A, Robertson S. Can subspecialty cancer consultations be delivered to communities using modern technology?--A pilot study. *Telemed J E Health* 2005; **11**: 608-615 [PMID: 16250826 DOI: 10.1089/tmj.2005.11.608]

10 **Canon S,** Shera A, Patel A, Zamilpa I, Paddack J, Fisher PL, Smith J, Hurtt R. A pilot study of telemedicine for post-operative urological care in children. *J Telemed Telecare* 2014; **20**: 427-430 [PMID: 25316038 DOI: 10.1177/1357633X14555610]

11 **Shearer NB,** Cisar N, Greenberg EA. A telephone-delivered empowerment intervention with patients diagnosed with heart failure. *Heart Lung* 2007; **36**: 159-169 [PMID: 17509423 DOI: 10.1016/j.hrtlng.2006.08.006]

12 BOARD OF GOVERNORS, In supersession of the Medical Council of India. Telemedicine Practice Guidelines. Available from https://www.mohfw.gov.in/pdf/Telemedicine.pdf

13 **Yadav** SK, Jha CK, Bichoo RA, Krishna A, Mishra SK, Gopinath P. Longitudinal trial of smart-phone based social media applications for remote monitoring of cancer patients in the context of a LMIC: compliance, satisfaction, and cost-benefit analysis. *Finjehew* 2020; **12**: 22-29 [DOI: 10.23996/fjhw.79961]

14 **Eng L**, Bender J, Hueniken K, Kassirian S, Mitchell L, Aggarwal R, Paulo C, Smith EC, Geist I, Balaratnam K, Magony A, Liang M, Yang D, Jones JM, Brown MC, Xu W, Grover SC, Alibhai SMH, Liu G, Gupta AA. Age differences in patterns and confidence of using internet and social media for cancer-care among cancer survivors. *J Geriatr Oncol* 2020; **11**: 1011-1019 [PMID: 32169545 DOI: 10.1016/j.jgo.2020.02.011]

15 **Falisi AL**, Wiseman KP, Gaysynsky A, Scheideler JK, Ramin DA, Chou WS. Social media for breast cancer survivors: a literature review. *J Cancer Surviv* 2017; **11**: 808-821 [PMID: 28601981 DOI: 10.1007/s11764-017-0620-5]

16 **Han CJ**, Lee YJ, Demiris G. Interventions Using Social Media for Cancer Prevention and Management: A Systematic Review. *Cancer Nurs* 2018; **41**: E19-E31 [PMID: 28753192 DOI: 10.1097/NCC.0000000000000534]

**Footnotes**

**Conflict-of-interest statement:** No conflict of interest.

**Open-Access:** This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/Licenses/by-nc/4.0/

**Manuscript source:** Invited manuscript

**Peer-review started:** April 10, 2020

**First decision:** November 20, 2020

**Article in press:**

**Specialty type:** Medicine, research and experimental

**Country/Territory of origin:** India

**Peer-review report’s scientific quality classification**

Grade A (Excellent): 0

Grade B (Very good): 0

Grade C (Good): C

Grade D (Fair): 0

Grade E (Poor): 0

**P-Reviewer:** Pan H **S-Editor:** Huang P **L-Editor:** Filipodia **P-Editor:**