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Use of self-administered surveys through QR code and same center telemedicine in a walk-in clinic in the era of COVID-19

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As COVID-19 continues to challenge healthcare systems worldwide, we read with great interest Turer et al's approach on telemedicine for COVID-19 in the US and we would like to share our center's experience to complement the view from a middle-income country's perspective.¹

Since a complete telemedicine program can't be created overnight, we faced the fact that it hasn't been a priority at our public hospitals to strengthen telemedical innovations. As such, we had to develop health informatics tools for the use of patients potentially infected with SARS-CoV-2 as the pandemic developed.

We faced the same realities that most physicians struggle with at first: Wearing personal protective equipment (PPE) complicates audio communication with patients. Furthermore, registering patient's information and medical history requires time and materials that could potentially become fomites facilitating transmission (ie, pens, pencils, and paper).

As a solution, we decided to create a survey using Google Forms and transformed the link for sharing it into a quick response (QR) code. As patients arrive at the waiting area of the walk-in clinic, they see posters with instructions detailing how to use their smart device to access a self-administered questionnaire (Figure 1A). Data gathered included symptoms, risk factors for severe disease, and prior medical history. This provides real-time information for the Infectious Diseases (ID) staff and colleagues to analyze at an adjacent, but isolated room where stratification and prioritization of patients is done and creates an automatic queue for the rest of the patients.

Patients are summoned, one at a time, to a room with a Skype connection (as Turer et al have previously suggested).¹ There a

doctor from the ID team runs a telemedicine consult where the patient can see the physician's face and discuss details about their chief complaint. The physician has the opportunity to ask any further information needed and, if necessary, explain the swabbing procedure to the patient (Figure 1B). Afterwards, communication is established with another doctor who is waiting, fully dressed in personal PPE, in another room to discuss the goals of the next encounter: swabbing, prescribing, and assessing for more detailed symptoms. Thereby, the exposure of the healthcare worker (HCW) in PPE to the potentially infected patient, and vice versa, is ideally reduced to a minimum.

In brief, patients enter the clinic, scan a QR code, fill out the questionnaire, and are consulted through same-center telemedicine—all without physical contact with the HCW. The ID team then considers whether it is necessary to undergo a swab or other procedures, reducing exposure to an average time of 5:43 minutes per patient.

As Hollander and Carr experienced, we found that web conferencing software was easily implemented in our center to diminish unnecessary contact between high-risk patients and HCWs.² This allowed a safe, comfortable, and humane one-on-one interaction for both parties and created our very own electronic PPE as per Turer et al's definition.¹

In our case, adapting this system came at little to no cost since the software was free to access and use. This raises the question as to whether such platforms comply with ethics and local general data protection regulation. Since the transmission of the data is encrypted by the software used, these authors' opinion is that the potential benefits outweigh the recognized risks of using telemedicine



Figure 1. (A) Waiting area of the clinic portraying posters with QR codes; (B) same-center telemedicine consult allowing a safe and humane patient-doctor interaction.

systems—particularly during the current pandemic. What may normally seem to be a disadvantage in low- and middle-income countries, the lack of strict billing and regulatory laws, plays as an advantage in COVID-19 times when it comes to telehealth regulation.

One of our main concerns was that patients may not be comfortable or able to answer the self-administered survey using smart devices. This was facilitated by the fact that most current smartphones only require the camera app to point at a QR code in order to access the link. Out of the 1009 patients in this model, 874 (86.6%) completed the task successfully. Fifty patients from the database were randomly selected and were asked to answer an e-mail satisfaction survey. Ninety percent reported they felt that they had enough time with their doctor to resolve their concerns, and 80% reported that it was easy to use and fill out the QR-based survey. The latter is consistent with the conclusions of a systematic review where self-administered questionnaire responses collected using smart devices showed improved data completeness, acceptability, and time taken to complete over paper surveys.³

We live in a middle-income country where we have the infrastructure to establish the aforementioned strategies. This may not be the case for hospitals in developing countries and certainly not for those in the least-developed countries. Despite the fact that we didn't achieve scripted triaging as with novel EHRs,⁴ it is these authors' opinion that we have achieved electronic check-in, real-time data analysis, and telemedicine capability. We share our model so that it may encourage others to adapt technologies according to their resources.

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AUTHOR CONTRIBUTIONS

All authors contributed significantly and equally.

CONFLICT OF INTEREST STATEMENT

None declared.

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