Perceptions towards COVID 19 and Reflections on Aarogya Setu Mobile Application Use among Keralites

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ABSTRACT

Background: Across the World, people trapped in the darkness of a standstill economy because of the lockdown are all looking for ways to once and for all fix the problems caused by SARS-CoV-2 virus and to prevent further damages. India's lockdown strategy could block the disaster for some time. Kerala, a small state in India with good healthcare infrastructure, was the first to detect a case in the country. Technology has played a tremendous role in updating the community and active surveillance of the disease. In the era of smartphones and mobile applications which has a great impact on today human actions and interactions, authorities use it as a good channel for communication as well as surveillance. Even though there are many concerns regarding privacy, a well-protected application with widespread reach can play a role in pandemic situations.

Aarogya Setu is a mobile application (app) developed by the Government of India to connect essential health services with the people of India in our combined fight against COVID-19. The App is aimed at augmenting the initiatives of the Government of India, particularly the Department of Health, in proactively reaching out and informing the users of the app regarding risks, best practices, and relevant advisories pertaining to the containment of COVID-19. Therefore, this study is taken up to assess the perception of the healthcare workers and the general population towards COVID 19 and their reflections on the Aarogya Setu application.

Methods: A Cross-sectional study using rapid assessment methods that take into account rapid behavioural changes owing to a pandemic situation was conducted. Quick data collection was done using google forms shared by medical students living in different parts of the state using social media platforms, and the survey was closed in 72 hours (28th-30th April 2020) and the available data (700) was analysed. This study has all inherent limitations of rapid assessment methods especially because it was conducted during a complete lockdown situation.

Results: Among the total study participants, 325(47.8%) were related to the healthcare field and more than half of the study participants were students less than 25 years. Almost all participants (97%) were aware of the pandemic situation. Everyone similarly approached the pandemic situation in terms of perceived susceptibility and severity. Relation to the healthcare field did not make any difference in the knowledge or attitude towards the disease. Among 82% who were aware of the Aarogya Setu app, only 22% had downloaded it and still, only 9% found it to be useful. No significant association was observed across education status, profession, or age.

Conclusion: Most people living across Kerala similarly approached the COVID-19 pandemic, irrespective of age, education or relation to the healthcare field. Even though smartphones are widely used, people were reluctant to download the app and use them. Aarogya Setu may become useful if or when there is community transmission; but at the time of writing, Kerala was considered safe at the current stage.

Keywords: COVID-19, Corona Virus, WHO COSMO Protocol, Aarogya Setu, Mobile health technology, Community Perceptions, Kerala, India

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INTRODUCTION

The Coronavirus pandemic continues to spread in large numbers. In India alone, cases have sharply spiked up, which has led to imposing even tougher measures. India reported its first case on 30th January in Kerala. The state which has a population of nearly 37 million,[1] known for its relatively good health indicators and literacy, approached this situation very diligently and won appreciation both nationally and internationally. The first case was seen in a student who returned from Wuhan.[2,3] The state who had experience in handling the Nipah outbreak[4] approached it very seriously - it was considered as a state emergency and the government started educating people, set up treatment, and cured all three COVID-19 patients who had come from China. COVID-19 was re-notified as a state-specific disaster on 20.03.2020, and the state strengthened the surveillance and control measures against the disease

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because of the increasing number of cases.[5] Preventive measures were taken up to protect individuals from the harmful coronavirus by enforcing strict guidelines.

Now at three months since the first case, Kerala is keeping its curve flat with positive caseload at a considerably low number of 504, of which 462 are declared cured, with 4 deaths and 38 remaining in hospitals as of May 6, 2020. This is all while the rest of the country is struggling with more than 53000 infections - meaning Kerala, with a population that adds up to 2.8% of the country, is contributing to less than 1% of the total caseload.

Mobile health technology has played a good role in this Epidemic situation for disease surveillance. It has had an incredibly good reach in the community. It also helps with targeted intervention from training to active surveillance. Personal intervention is also possible with mobile technology.

This technology inevitably plays an important role in a pandemic situation, with counties adopting their mobile intervention strategies to control the situation.[6] Aarogya Setu is the mobile intervention from the Government of India.

Aarogya Setu: Mobile health technology address the COVID-19 situation

Due to the ever-increasing rate of infection of the coronavirus, the Indian government has launched an app called Aarogya Setu.[7] This app will tell you whether you are at risk of suffering from the coronavirus or not based on your health, geographical location and travel information. This app has been developed under the Public-Private Partnership by the National Informatics Centre that comes under the Ministry of Electronics and Information Technology (MeitY), initiative of the Government of India.[7] It is a tracking app which uses the smartphone's GPS and Bluetooth features to track the coronavirus infection. With Bluetooth, it tries to determine the risk if one has been near (within six feet of) a COVID-19 - infected person, by scanning through a database of known cases across India. Using location information, it determines whether the location one is in belongs to one of the infected areas based on the data available.[8]

This app is an updated version of an earlier app called *Corona Kavach* (now discontinued) which was released earlier by the Government of India.[9] Aarogya Setu app has four sections, namely, risk of acquiring COVID 19 for the users, self-assessment regarding the risk of being infected, updates on local and national COVID 19 cases and E-pass, which is yet to be operationalized.[7]

It asks for name, gender, profession, travel history and profession. The data extracted are to be shared only to the Government of India according to the terms and conditions of the application.[7]

The application also provides information about the best practices and advisories regarding the containment of the virus. This app can help quite a bit in the fight against the coronavirus. It works based on contact tracing and can help a user identify a possible coronavirus 'hotspot' around his or her area. It has access to the government's database of known coronavirus cases. It directly alerts you with a notification if you come close, even unknowingly, to an infected person. To be effective, it requires users to keep their device's Bluetooth and location history 'on' as much as possible. Users will be alerted, without disclosing any identities, if they are in the vicinity of someone who is tested positive.[7]

It can help people stay safe and adopt necessary precaution in some areas where there are cases and accordingly, help stop or prevent community transmission to an extent. By the basis of geotagging, it can also alert a specific user about their proximity to a nearby infection case or hotspot. By identifying "hotspots", necessary mapping can help deal with the problem of community transmission, i.e., when cases start spreading within the population in such a way that people do not know how they were exposed to the contagion. This is known as "Stage 3" of an outbreak.[10]

The application also helps users self-identify their risk and monitor their health assessment, considering the times when it can get difficult (and most of all, is not particularly safe to step out and visit health clinics).[7] Aarogya Setu app also helps people identify the symptoms, alert them about the best safety precautions and other relevant information concerning the spread of COVID-19. While this is a noble initiative, the app also lists down basic quarantine measures for those who are considered to be in the 'high-risk' category. It can also help people who have had an extensive travel history self-quarantine and prevent any risk of transmission.[7] The app also offers rolling updates from the Ministry of Health and Family Welfare on the coronavirus pandemic.[7] Another important aspect in the application is, it also has a detailed list of coronavirus helpline numbers for each state. The government has said that data would be collected only for managing the pandemic. The privacy policy of the application clearly states that the user data extracted will not be shared with third-party.[7] Evidence from previous pandemics show that a lack of proper knowledge about the disease is associated with negative emotion among people which can further complicate the attempts of preventing the spread of the disease.[11] Taking the perspective into our consideration, we aimed to assess the perception regarding COVID-19 among the general public and control measures taken by the government of India in terms of apps and innovative solutions such as Aarogya Setu application, which

promote the same idea to spread information and can help authorities make the population aware and save lives. To be effective, the app must help those who are most vulnerable to the virus, but most of them do not have smartphones. India has more than 1.3 billion people, but less than 400 million are smartphone users, [12] this means that the smartphone penetration in the country stands at 28%, which may include multiple devices for the same people. Section 58 of the Disaster Management Act 2005 imposes penal action upon employers of enterprises if their employees do not comply with the directive of usage of Aarogya Setu[13] whereas, autonomy guaranteed by the Constitution of India also grants individual freedom not to take part in activities he does not approve of.[14] These two statements contradict each other regarding the consent and privacy of personal information. In the initial development of the application, it was stated that at least 50% of the population must download the app for it to be an effective solution and till date (7th May 2020) the application was downloaded by 90 million people in India. Therefore, in our study, we intend to assess the perception of the healthcare workers and the general population towards COVID 19 and their reflections on the Aarogya Setu application.

MATERIALS AND METHODS

A Cross-sectional study was conducted using a Modified WHO Cosmo protocol and questionnaires implemented through google forms to assess the behavioural insights in a pandemic situation. As a part of the local strategy, a few questions regarding the Aarogya Setu app were also included. Data was collected from 700 adult participants across various districts of Kerala for this cross-sectional study using mixed sampling from 28th April to 30th April 2020. All people who were aged 18 years and over were invited to participate in the study. Medical students of Sree Gokulam Medical College and their family were included in the pilot survey as there were representatives from various districts of Kerala. These students collected community data from their neighbourhood using questionnaires in google forms to complete the first round. As this is a self-administered questionnaire, a consent form was introduced first to ensure autonomy. Personal details of participants were omitted to ensure the confidentiality of participants. The approval of the institutional ethics committee (IEC) of Sree Gokulam Medical College & Research Foundation was obtained prior to data collection.

Descriptive statistical measures like percentages for description and χ^2 tests were used to find out the association; using SPSS Version 22 software and at p-value less than 0.05 is considered significant.

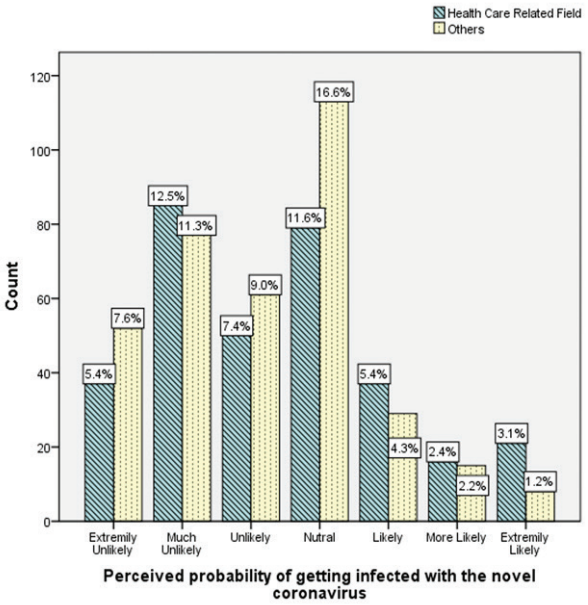

Figure 1. **Showing comparison of Perceived probability of getting infected with the novel coronavirus between participants in health-related field and Others**

RESULTS

Among the 700 study participants, 680(97.1%) gave consent to participate in the study. 346(50.9%) were less than 25 years and among them, 325(47.8%) were medical students (healthcare field), and 355(52.2%) were others. 271(39.9%) were males and 409(60.1%) were females. About 677(99.5%) were aware of COVID-19. Among the study participants, 71.2% had good knowledge about COVID 19 pandemic and control measures **(Figure 1)** and 570(83.8%) had good knowledge about the preventive measures. Among the participants, 362(53.2%) felt that they are extremely unlikely and 126(18.4%) felt that they are extremely likely to be infected with the novel coronavirus. Comparison of the probability of getting infected with COVID 19 between people in the healthcare field and others, it was found that those in healthcare professionals(22.7%) felt that they have higher chances of getting infected than other professionals(14.6%), which was found to be statistically significant with p-value 0.016(Chi-square of 15.570). Perception about avoiding an infection with the novel coronavirus in the current situation was extremely difficult among healthcare professionals(15.3%) than those in others(11.8%) whereas 68.9% of healthcare professionals and 63% in others felt it was extremely easy to avoid infection with the novel coronavirus which was found to be statistically significant with p-value 0.023(Chi-square 14.635).

Regarding the awareness about the Aarogya Setu app, 556 (82%) were aware of the app whereas, 124(18%) did not know about it and among those who were aware of the app, only 148 (22%) of them downloaded it and only

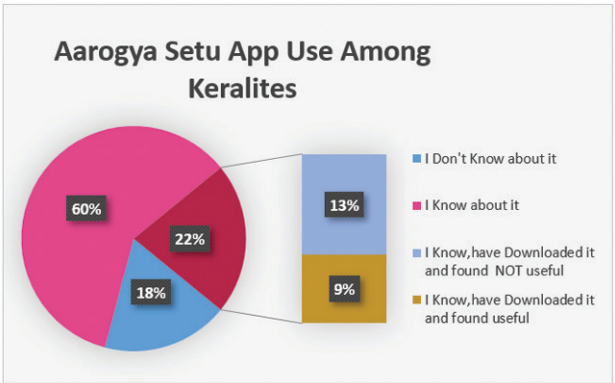

Figure 2. **Showing Aarogya Setu Mobile Application use among Keralites**

60(9%) found it to be useful and the remaining 88(13%) did not find the app useful. Though the older generation used the application more than the younger generation, there was no significant association between younger and older generation in the usage of the application and though the people in other professions other than healthcare used the application more, there was no significant association between them **(Figure 2).**

DISCUSSION

In the present study there was almost equal participation of people from the healthcare field (47.8%) and other professions (52.2%) and also similar participation based on age category, namely, medical students less than 25 years (50.9%) as well as older adults (49.1%). Therefore, this equal participation both in age groups and profession led us to a comparison between those in the medical field and the common people on their perception towards COVID 19 and the Aarogya Setu application. In our study, knowledge assessment was done on various aspects. These were questions regarding - washing hands frequently, sanitizing surfaces diligently and avoiding stepping out of the house, unless important and if anyone exhibited symptoms, or were in the presence of someone with the symptoms of COVID-19, wearing masks to help limit transmission of germs, elderly persons, children and those with the underlying medical condition needing to be extra careful and be safe, the risk and severity of infection among people with chronic illness, incubation period of coronavirus, transmission and knowledge regarding methods to avoid infection. Our study had 71.2% of participants with good knowledge about COVID 19 pandemic and control measures and only 12% had poor knowledge which might be due to their ignorance about the current pandemic. More than half of the participants feel that they were extremely unlikely to be infected with the novel coronavirus. This perception might be due to the lockdown which has been imposed by the central and state government due to which people are not likely to move around in public unless important and also they have a sense of security staying in Kerala, as the cases are not in the rise in the current scenario. Awareness about the Aarogya Setu app, more than 80% were aware of the app and only 22% downloaded it and among them, only 9% found it to be useful. The reason for this difference in knowledge and usage might be that not many use smartphones especially the elderly population and they are also sceptical about the breach of security and privacy. World Health Organization (WHO) has published a manual on implementing electronic health records (EHRs) for developing countries,[15] and many agencies are funding e-health efforts.[16] However, evaluations are essential to ensuring that these systems are safe, beneficial, and not a waste of scant resources. There are few rigorous evaluations worldwide.[17] Systematic reviews of e-health in primary health care, [18, 19] telemedicine, [20] and its cost-effectiveness[21] have found that most articles "lacked any evaluation of their concrete application to health care." The strongest evidence for the beneficial impact of e-health and mobile applications on health care will come from long-term follow-up carried out by independent evaluators. With the rapid growth of e-health in developing countries, there is an urgent need for solid evidence of its impact to justify and guide the investment of resources in such systems. Despite major increases in evaluations in recent years, most large e-health implementations have little or no evaluation data. To date, most studies have been small; focused on process indicators rather than patient outcomes, or the attitudes of users and patients; and performed mostly by academic groups. An increased focus on including evaluations as part of e-health implementations is necessary and should be adopted by organizations implementing or funding such systems.[22]

CONCLUSION

Risk perceptions are similar across all groups. Most people thought the virus will inevitably reach them, sooner or later, and as a result, have smartly decided to follow the guidelines placed by the authorities. Media and technology helped people stay updated, and Mobile Health Technologies like Aarogya Setu, have thought to be useful tools that ensure safety and optimism in its users through media discussions have made people sceptical about the same. Moreover, people in Kerala also see the benefit of staying at home, staying safe, and contributing to the cause, simply by sacrificing a little freedom for a period of time.

END NOTE

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