[Downloaded free from http://www.ijph.in on Wednesday, March 17, 2021, IP: 14.139.185.130]

Brief Research Article

How Indians Responded to the Arogya Setu App?

Prakash Babu Kodali[1], Sibasis Hense[1], Swarajya Kopparty[2], Gangadhar Rao Kalapala[3], Banashri Haloi[4]

[1]Assistant Professor, [4]MPH Student, Department of Public Health and Community Medicine, Central University of Kerala, Kasaragod, Kerala, [2]Scientist-B, DRDO, Naval Selection Board, Visakhapatnam, Andhra Pradesh, [3]PhD Candidate, School of Health Systems Studies, Tata Institute of Social Sciences, Mumbai, Maharashtra, India

Summary

The mHealth app Arogya Setu can substantially contribute to the containment and management of COVID-19. This study explores the experiences and expectations of Arogya Setu app users by conducting a combined content analysis of their reviews. Five hundred and three most relevant reviews were analyzed using the descriptive statistics and thematic analysis. The reviews are primarily posted in the areas of user acceptance (80%), app usefulness (72.8%), and app features (62.2%). The thematic analysis resulted in four themes: user acceptance, app usefulness, promptness of the Indian Government in bringing the app on time, and concerns and cautions raised by the users. These help in strengthening the app features enabling the real-time data capture and analytics and providing timely information to authorities for better decision-making.

Key words: Arogya Setu app, combined content analysis, COVID-19, mHealth, technology acceptance

Introduction

mHealth apps are crucial in the disease containment and management during pandemics and can support health systems in disease surveillance, risk assessment, case identification, contact tracing, and situation monitoring.[1,2] In India, the Arogya Setu is a COVID-19-tracking app.[3] It informs the users regarding the risks assessment and provide relevant advisories. As of April 21, 2020, this app has over 50 million downloads, with an average rating of 4.6/5, from 273,646 users.[4] Many users post reviews encompassing their experiences and expectations for this app which could provide valuable first-hand information and facilitate in strengthening the app's features.

The current research was aimed at analyzing Arogya Setu app user's experiences and expectations. Specifically, it answered two important questions: (i) what are the areas in which Arogya Setu users posted their reviews? and (ii) what is the perceived usefulness, criticism, and expectation of the users toward the app? The combined content analysis (CCA) methodology was employed to undertake this research.[5]

Materials and Methods

A sample of 503 most relevant reviews (as per the Google algorithm) available publicly and posted in English by the users until April 21, 2020, were purposefully selected from the Google play store (https://play.google.com/store/apps/details?id=nic.go i.aarogyasetuandhl=en_INandshow AllReviews=true). This sample was 0.18% of the total reviews and consistent with other studies employing the content analysis of reviews.[6] The reviews were transported into MS-Excel 2016[7] using copy paste option, cleaned, formatted, and analyzed. In order to ensure the anonymity, no identifiable data of the users (such as name, age, etc.,) were transferred into the excel sheet.

An established coding technique was used to analyze the reviews.[8] It involved: (i) data immersion, (ii) data reduction through the systematic coding and themes generation, and (iii) interpretation of the findings. Given that limited research is conducted using the content analyses of user's reviews, the current study used an inductive approach to develop a coding scheme resulting in 15 dimensions on which the analyses were

Address for correspondence: Dr. Sibasis Hense, Room No 112, Brahmaputra Block, Department of Public Health and Community Medicine, Central University of Kerala, Tejaswini Hills, Periya, Kasaragod - 671 316, Kerala, India.
E-mail: dr.sibasishense@cukerala.ac.in

Access this article online

Quick Response Code:

Website: www.ijph.in

DOI: 10.4103/ijph.IJPH_499_20

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

Submitted: 30-Apr-2020 **Revised:** 09-May-2020
Accepted: 11-May-2020 **Published:** 02-Jun-2020

How to cite this article: Kodali PB, Hense S, Kopparty S, Kalapala GR, Haloi B. How Indians responded to the Arogya Setu app? Indian J Public Health 2020;64:S228-30.

[Downloaded free from http://www.ijph.in on Wednesday, March 17, 2021, IP: 14.139.185.130]

conducted.[9,10] Based on this scheme, the reviews were analyzed quantitatively using the descriptive statistics (frequency and percentage), and additional qualitative analyses were presented in the separate themes. Rigor was established through prolonged engagement during the process of data entry, reading and re-reading the reviews, data cleaning, and coding that also ensured familiarity with the data. Data was independently coded by the two groups of researchers, and 50% of the reviews were randomly selected for inter-coder reliability, calculating Cohen's kappa, which was found statistically significant (at $P < 0.05$) for the majority of dimensions. Ethics approval from institutional committee was not obtained as the study was conducted on publicly available secondary data without involving any human subjects. The researchers ensured that the research met the ethical principles of respect, beneficence, nonmaleficence, and justice.

Results

Quantitative analyses found that more than half (56%) of the users assigned 4- and 5-star ratings, signifying higher satisfaction. In contrast, only 27% of the users assigned 1- and 2-star ratings, signifying lower or poor satisfaction of the app. Most of the reviews were posted in the areas of user acceptance (80%), app usefulness (72.8%), and app features (62.2%). The descriptions of reviews posted by the users across dimensions are given in Table 1.

Qualitative analyses of the reviews resulted in four themes with prime focus on: User acceptance, app usefulness, promptness of the Indian Government in bringing the app on time, and concerns and cautions raised by the users.

Predominantly positive user acceptance

Most of the reviews reflected the optimistic views about the app, such as *"excellent app," "helpful," and "timely."* Reviews reporting "positive user acceptance" generally reflected the individual's intention to use the application.

Table 1: Descriptions of the reviews posted by the users across dimensions

Dimensions	*n* (%)
User acceptance	418 (83.10)
Usefulness of the app	366 (72.76)
Ease of use	19 (3.78)
Data completeness and accuracy	70 (13.92)
Mobile ownership	35 (6.96)
Bluetooth use by the app	68 (13.52)
Software issues	94 (18.69)
User interface	118 (23.46)
Power consumption	33 (6.56)
App characteristics	313 (62.23)
User adoption	86 (17.10)
Government focus	115 (22.86)
Trustworthiness of the app	26 (5.17)
Recommendations on GIS and maps	80 (15.90)
Language compatibility of the app	10 (1.99)

GIS: Geographic Information Systems

"the app is a very good initiative and I'm positive that it'll serve the purpose (User 018)."

In contrast, reviews reporting "negative user acceptance," described the app as "*poor, passive, and nonresponding."* Negative user acceptance was often accompanied with decision to uninstall the app.

Useful app

The users reiterated that the app was useful in alerting them from COVID-19. These ideas were predominantly accompanied by the functions performed by the app such as disease monitoring, assessment of individuals, and updates.

It is useful and trustworthy app for keeping ourselves away from such hidden enemy like COVID-19 (User 220).

Reviews quoting usefulness were often accompanied by the suggestions to improve the app's features; these included: Integration with GPS systems and maps, user alerts in red zones/hot-spots, provision of regular COVID-19 updates, enabling contact tracing, and making the app workable on feature phone platforms.

Timely initiative

One of the important themes that emerged was timely development and deployment. The analyses also noted that Arogya Setu being a Government owned app would gain higher user's trustworthiness and generate a sense of confidence among the users.

This app is a timely initiative. It'll serve as a major boost to the Government in real time data collection and help authorities to make greater data driven decision (User 407).

Reviews highlighted "government focus" as an important facilitator. The proactive campaigns for installing this application, particularly from the top leadership of the country were perceived to be motivating users to install and use the app.

Concerns and cautions

Users also reported unfavorable feedback reflecting their concerns in using the app. They categorized their reservation in terms of data-specific, system-specific, and users'-specific concerns. It was found that the application relies on self-reported data for tracking positive cases and proximity assessment. This feature is critically reliant on authentic information provided by the users. Concerns about the inaccuracy of data provided were found to be inhibiting potential users to use this app.

Please ensure the data collected is authentic. Some may even uninstall the app on noticing that they are at risk which may inhibit the efficiency of this app (User 008).

Several system specific shortcomings were noted as well. Specifically, bugs within software, issues with one time password registration, and poor user interface and unnecessary use of Bluetooth feature causing frequent power drain were the common system-specific challenges faced by the users. In some reviews, it was also observed that users uninstalled the app due to these issues.

[Downloaded free from http://www.ijph.in on Wednesday, March 17, 2021, IP: 14.139.185.130]

Users also feared certain features of the app could compromise security. Bluetooth which mandatorily requires to be switched on was perceived to be making the device vulnerable to cyber threats. Other issues concerning the trustworthiness of app included privacy of the user, data security, and reliability of self-assessment questions.

Discussion

Most of the users were optimistic about Arogya Setu app due to its usefulness and acceptance. Expectations were also noted among the users to include the additional features into the app such as geo-location tracking, timely COVID-19 updates, information on red-orange-green zones, and deployment in nonsmartphone platforms. Existing literature suggests that the app primarily supports the syndromic surveillance and has limited features compared to similar apps such as Alipay Health of China and Corona 100 m of South Korea[3] The inclusion of additional features will improve the usefulness of the app and its adoption in India.

Unfavorable feedback was also observed. These were comparatively less than the positive reviews. Users who posted negative reviews often tend to uninstall the application potentially downplaying the success of the app. The government must focus on fixing the bugs, improving the quality of data collection, and user privacy. Measures need to be in place to ensure the reliability of information provided by the users; therefore, provision for cross-verification of data entered by the users could be crucial.

Limitations

The data used in this study were highly dependent on individual user's experiences rather than structured data collection methods. However, the use of CCA and inductive approach has reduced the bias by developing the coding scheme. The scope of this research was confined to analyzing the reviews of users who used this app and posted their reviews.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Ferretti L, Wymant C, Kendall M, Zhao L, Nurtay A, Abeler-Dörner L, *et al*. Quantifying SARS-CoV-2 transmission suggests epidemic control with digital contact tracing. Science 2020;368:eabb6936.
2. Oliver N, Letouzé E, Sterly H, Delataille S, De Nadai M, Lepri B, *et al*. Mobile Phone Data and COVID-19: Missing an Opportunity? arXiv preprint arXiv: 200312347; 2020.
3. Garg S, Bhatnagar N, Gangadharan N. A case for participatory disease surveillance of the COVID-19 pandemic in India. JMIR Public Health Surveill 2020;6:e18795.
4. Google. Aarogya Setu; 2020. Available from: https://play.google.com/store/apps/details?i d=nic.goi.aarogyasetu and hl=en_IN and showAllR eviews=true. [Last accessed on 2020 Apr 21].
5. Hamad EO, Savundranayagam MY, Holmes JD, Kinsella EA, Johnson AM. Toward a mixed-methods research approach to content analysis in the digital age: The combined content-analysis model and its applications to health care Twitter feeds. J Med Internet Res 2016;18:e60.
6. Du J, Tang L, Xiang Y, Zhi D, Xu J, Song HY, *et al*. Public perception analysis of tweets during the 2015 measles outbreak: Comparative study using convolutional neural network models. J Med Internet Res 2018;20:e236.
7. Grech V. WASP (Write a Scientific Paper) using Excel–1: Data entry and validation. Early Hum Dev 2018;117:98-103.
8. Forman J, Damschroder L. Qualitative content analysis. In: Empirical Methods for Bioethics: A Primer. Vol. 11. United Kingdom: Elsevier; 2007. p. 39-62.
9. Gibbs G. Analysing Qualitative Data. Trowbridge, Wiltshire: Sage Publications Ltd.; 2007.
10. Elo S, Kyngäs H. The qualitative content analysis process. J Adv Nurs 2008;62:107-15.

Polybion®

ACTIVE

DAILY ACTIVE ENERGY

Releases Energy[1]

Supports Immunity[2]

MAT-IN-OTHER-20-000117

For more information, Call 022-24942113 **or** To write to us visit: in.pg.com/contact-us **I** **Website:** www.polybion.in
Follow us on: www.facebook.com/mypolybion

Ref: 1. Laquale, Kathleen M (2006). B-complex vitamins' role in energy release. In Movement Arts, Health Promotion and Leisure Studies Faculty Publications. Paper 25.
2. EFSA Journal 2011;9(4):2063

Any resemblance to reality is unintended and pure coincidence. Fictional Characterization. Polybion contains B-complex vitamins which play an essential role in supporting energy release by acting as co-factors/ co-enzymes during energy metabolism, For more information refer to: procter & Gamble Health limited (formerly known as merck Limited), Godrej One, 8th Floor, Pirojshahnagar, Easterm Express Highway, Vikhroli East, Mumbai - 400079, India.