



A CROSS-SECTIONAL STUDY TO ASSESS AWARENESS AND USAGE OF GOVERNMENT OF INDIA'S M-HEALTH APPS BY SMARTPHONE USERS IN MAHARASHTRA

Community Medicine

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ABSTRACT

Background: M-Health (or mobile health) is commonly defined as the provision of health services through mobile technologies. In 2016 Indian government launched various m-health applications under National Health Portal and also launched Ayushman Bharat Digital Mission with various digital initiatives to reach universal coverage of Health. **Methods and Material:** A cross-sectional study using an online population-based survey was carried out in Maharashtra on smartphone users aged 18 and above, using the virtual snowball sampling technique until a sample size of 193 was reached. A predesigned and pretested self-administered questionnaire on GOI's m-health apps was used as a study tool. **Results:** Among respondents 69% were male and 30% were female respondents and a majority of the respondents were in the age group of 18-28 years (53.36%). The majority 60% of respondents spend approx. 4 hours of time on the internet daily. Awareness of GOI's m-health apps was seen in only 28% of the study population. Awareness and usage were seen maximum for Arogya setu, Cowin, UMANG & ABHA compared to other apps. There is no significant association between awareness with Gender, Age, Education & number of hours spent on the internet. **Conclusions:** Despite people spending time on the internet for health-related information & activities, Awareness of GOI's m-health apps is low. The level of awareness is an important factor for utilization of these GOI's m-Health apps irrespective of gender, age, and education differences.

KEYWORDS

M-Health, GOI, Awareness, Usage

INTRODUCTION

In general terms, m-Health is the usage of smartphones for health care delivery. m-Health is commonly defined as the provision of health services through mobile technologies. It is about leveraging mobile and wireless devices to improve health outcomes. [1] Mobile technologies are making huge inroads in the healthcare space beyond its primary purpose of communication, especially in developing countries like India. It is recognized as a powerful tool for improving efficiency in the health sector.

MOHFW, Government of India recognizes the potential of digital health for transforming healthcare delivery, implementing effective monitoring, and evaluation platforms and promoting Digital health and has undertaken various initiatives using Information & Communication Technologies (ICT) for improving the efficiency & effectiveness of the public healthcare system. [2] In 2016 Indian government launched National Health Portal to provide healthcare-related information to the citizens of India and to serve as a single point of access for consolidated health information. [3] The National Institute of Health and Family Welfare (NIHFV) have established the Centre for Health Informatics to be the secretariat for managing the activities of the National Health Portal. The Government of India has launched several Health-related applications and portals through NHP. Recently the government of India launched Ayushman Bharat digital Health mission in 2021[4], which started as a pilot project under the name National Digital Health Mission in 2020 [5] with the broad objective to strengthen the accessibility and equity of health services, including a continuum of care with citizen as the owner of data, in a holistic healthcare programme approach leveraging IT & associated technologies and support the existing health systems in a 'citizen-centric' approach.

Various health portals or applications are there under the GOI's website for better healthcare delivery. In front is the "Ayushman Bharat Digital Mission" to create a comprehensive digital health infrastructure for the country. Other notable m-health apps include "e Sanjeevani" for telemedicine consultations[6] which are massively used by GOI during COVID-19, "UMANG"(Unified Mobile Application for New-age Governance) for accessing a range of government services including Health services, and "Arogya setu" for COVID-19-related-information and self-assessment. The popularity of m-Health applications in the field of health and medical education is rapidly

increasing especially since the COVID-19 pandemic. There are apps which are accessible to the healthcare workers like NIKSHAY(End TB), ANMOL (Auxiliary Nurse Midwife Online) etc. and some others are purely for the community such as MERA ASPTAAL, M-DIABETES APP, NHP SWASTH BHARAT etc. [2] These m-health apps have the potential to significantly improve healthcare outcomes in India by increasing access to healthcare services, reducing costs, and empowering citizens to take charge of their own health.

This study recognized 17 m-health apps launched by the Government of India which can be accessible at the community level. However, there is no evidence or effort to track the awareness and usage of these applications. This study is aimed to assess the awareness and usage of GOI's m-Health applications among the smartphone users of Maharashtra.

METHODOLOGY

Institutional ethical clearance was obtained before commencing the study. An online population-based cross-sectional survey was conducted on smartphone users of Maharashtra. A Virtual Snowball sampling technique was used, and a Google form was created with predesigned and pretested questionnaires related to the topic and distributed to smartphone users through various online platforms, they were requested to forward this link to their online contacts to achieve the sample size of 193. This sample size was based on a prevalence of 56%. [7] voluntary informed consent was obtained from smartphone users above 18 Years. The data was analyzed with the help of Microsoft excel version 365 for the descriptive analysis and the chi-square test was used to find any association between different variables.

RESULTS

Table1: Socio-demographic Characteristics Of The Study Participants (n=193)

| Sociodemographic Variables (N=193) | | Frequency (%) |
|------------------------------------|-------------|---------------|
| Gender | Male | 134(69.43%) |
| | Female | 59(30.56%) |
| Age | 18-28 years | 103(53.36%) |
| | 29-38 years | 50(25.90%) |
| | 39-48 years | 23(11.91%) |
| | 49-58 years | 11(5.69%) |
| | >59 years | 6(3.10%) |

| | | |
|-----------|----------------|------------|
| Education | Illiterate | 1(0.5%) |
| | Primary School | 4(2%) |
| | Middle School | 19(9.84%) |
| | HSC | 55(28.49%) |
| | Graduate/PG | 96(49.74%) |
| | Professionals | 18(9.32%) |

Table 1 explains the sociodemographic profile of the study participants where 134 (69.43%) respondents were male, and 59 (30.56%) respondents were female. Most of the respondents were in the age group of 18-28 years (53.36%) followed by 29-38 years (25.90%) whereas 3.10% of respondents were more than 59 years age-old. The majority of the respondents were literate and educated with Graduation/PG 96 (49.74%) followed by an HSC certificate 55 (28.49%). Among the respondents, approximately 75(38.86%) were spending 2-4 hours on the internet daily and 38(19.68%) for 4-6 hours whereas 54(27.97%) respondents spent less than 2 hours as mentioned in Table 2.

Table 2: Daily Time Spent On The Internet (n=193)

| Time spent on the internet | Frequency (%) (N=193) |
|----------------------------|-----------------------|
| < 2 Hours | 54(27.97%) |
| 2-4 Hours | 75(38.86%) |
| 4-6 Hours | 38(19.68%) |
| 6-8 Hours | 16(8.29%) |
| >8 Hours | 10(5.18%) |

Awareness status of GOI's m-Health apps in study participants:

Table 3 showed the awareness of the GOI's m-Health app among the study participants. It was observed that 55(28.49%) respondents were aware of any of the GOI's m-health apps rest 138(71.50%) were not aware. Awareness was seen more in females 20(33.89%) compared to males 35(26.11%). Maximum (32%) awareness was seen in the groups of 18-28 years and 29-38 years compared to other age groups, No (0%) awareness was seen in the age group of 49-58 years and >59 years.

Table 3: Awareness Of Goi's M-health Apps According To Sociodemographic Profile (n=193)

| Sociodemography of the study participants | | Awareness of any Government of India's m-health app | | Total | P value |
|---|----------------|---|----------|-------|---------|
| Variable | Category | Yes N (%) | No N (%) | N | |
| Gender | Male | 35 (26) | 99 (74) | 134 | 0.27* |
| | Female | 20 (34) | 39 (66) | 59 | |
| Age | 18-28 years | 33 (32) | 70 (68) | 103 | 0.24* |
| | 29-38 years | 16 (32) | 34 (68) | 50 | |
| | 39-48 years | 6 (26) | 17 (74) | 23 | |
| | 49-58 years | 0 (0) | 11 (100) | 11 | |
| | >59 years | 0 (0) | 6 (100) | 6 | |
| Education | Illiterate | 0 (0) | 1 (100) | 1 | 0.07* |
| | Primary School | 0 (0) | 4 (100) | 4 | |
| | Middle School | 1 (6) | 18 (94) | 19 | |
| | HSC | 16 (29) | 39 (71) | 55 | |
| | Graduate/PG | 32 (33) | 64 (67) | 96 | |
| | Professionals | 6 (33) | 12 (67) | 18 | |

*Not significant

Note: Pearson's chi-square test was used to calculate p-value.

Education-wise, it was observed the awareness was almost the same with a range of 29-33% in Graduates/PGs, Professionals, and HSC and negligible awareness was seen in a respondent who had education less than middle school.

Table 3 also shows the calculated p-value after applying Pearson's chi-square test to find the association between Awareness and variables such as gender, age, and education. The p-value obtained was >0.05 hence there was no significant association between the awareness and all three variables.

Awareness And Usage Of Individual GOI's M-health Applications

Table 4 represents the checklist related to all the individual 17 GOI's m-health apps and their awareness and Usage among the respondents. It was observed that the awareness was seen maximum for Arogya Setu 130(67%), COWIN 113(59%), ABHA 42(22%), and UMANG 35(18%) compared to all other apps where it was less than 10%. Usage

of the m-Health apps was assessed by the respondents aware of the respective apps. Usage was found similar to awareness, that it was more for UMANG 16(46%), Arogya Setu 59(45%), ABHA 18(43%), and COWIN 37 (33%) while for the rest of the app, it was seen in less than 10% respondents.

Table 4: Awareness And Usage Of Individual Goi's M-health Application (n=193)

| NAME OF THE APP | Awareness (N=193) Frequency (%) | Usage among those aware Frequency (%) |
|-----------------------------|---------------------------------|---------------------------------------|
| AROGYA SETU | 130(67) | 59(45) |
| COWIN | 113(59) | 37(33) |
| ABHA | 42(22) | 18(43) |
| UMANG | 35(18) | 16(46) |
| MCTS | 18(9) | 0(0) |
| VACCINE TRACKER | 17(9) | 3(18) |
| MERA ASPTAAL | 14(7) | 1(7) |
| ONLINE REG APP | 14(7) | 1(7) |
| M DIABETES APP | 13(7) | 0(0) |
| NHP SWASTH BHARAT | 12(6) | 1(8) |
| E RAKTKOSH | 11(6) | 2(18) |
| KILKARI | 11(6) | 0(0) |
| INDIA FIGHTS DENGUE | 9(5) | 1(11) |
| NHP DIRECTORY SERVICES | 9(5) | 3(33) |
| TOBACCO CESSATION PROGRAMME | 7(4) | 1(14) |
| NO MORE TENSION | 6(3) | 1(17) |
| NOTTO | 6(3) | 0(0) |

Note: Usage is calculated from the awareness of the respective apps.

DISCUSSION

This study aimed to assess the awareness of the Government of India's m-Health apps, finding that 55 respondents (28.49%) were aware of the apps, while 138 (71.50%) were not. This result is consistent with a study by Kayyali et al.[8] that found low awareness of m-Health apps despite their increasing number, but contradictory to the results of a study by Sanjiv Kumar et al[7], who found that 56.3% (139/247) of participants were aware of m-health apps. However, the latter study assessed the awareness of all m-health apps, whereas this study specifically focused on GOI's m-health apps. Another study by Madhur Borah et al[9] found high awareness (≥95%) of Government COVID-19 m-Health applications, but this study was limited to the Arogya setu and Cowin portal during the Covid-19 pandemic. Paropkari et al[10] found that out of 119 responses, 51.27% were aware of any of the six considered apps among the population, while Anu Grace Sam et al[11] found that only 8% had high awareness, 61% had average awareness, and 31% had low awareness of m-Health apps in general. Another study by Jembai et al[12] found that most respondents were aware of COVID-19 apps (82.7%), followed by personal health and fitness apps (76.3%) and medical education apps (61.8%). Finally, a study by Mehbodniya et al[13] found high awareness of m-Health among smartphone users who were using smartphones to manage their health conditions.

This study identified 17 GOI's m-health apps, finding that Arogya setu (67%), Cowin (59%), ABHA (22%), and UMANG (18%) had the highest awareness among respondents, while less than 10% were aware of the remaining 13 m-Health apps. Similarly, UMANG (46%), Arogya setu (45%), ABHA (43%), and Cowin (33%) had the highest usage rates, while less than 10% of respondents used the other 13 m-Health apps. In contrast, Sanjiv Kumar et al[7] found that only 31.6% of participants were using m-Health apps, with 40.9% citing lack of awareness as the reason for not using them. Madhur Borah et al[9] found that most study participants were moderately aware of the Arogya Setu app, with 76% of app users using the app occasionally, and that 61% of respondents were moderately aware of the CoWin portal, with 68.7% of users using the app occasionally. Paropkari et al[10] found that only a meagre 4.91% of those who were aware had used any of the six m-Health apps considered, with most respondents using health apps by a private firm. Jembai et al[12] found that the COVID-19 pandemic was the reason for the higher usage rate of COVID-19 management apps compared to fitness apps and medical education apps.

After applying the chi-square test, no significant association was found

between awareness and gender, age, or the number of hours spent on the internet. Jembai et al[12] also found no effect of age, phase of the study, or gender on awareness of health and fitness or COVID-19 applications, but respondents with higher family household incomes were more likely to use medical education and COVID-19 m-Health apps than those with lower household incomes.

CONCLUSION

In this era of increasing Smartphone users all over the world, the Government of India started various digital platforms (m-Health) to improve access to healthcare. Despite people spending time on the internet for health-related information & activities, Awareness of GOI's m-health apps is still low (28%). Moreover, the usage of installed GOI's m-health is not satisfactory. The level of awareness and usage is an important factor for the utilization of these GOI's m-Health apps irrespective of gender, age, and education differences. Though the National digital health mission was started with various digital initiatives, lack of awareness and usage of GOI's m-Health apps will have a detrimental effect on our progress towards Universal Health Coverage.

RECOMMENDATIONS

Further explorative studies in different populations to understand the reasons for low usage can be undertaken.

Based on the in-depth studies, interventions can be planned, and innovative ideas can be promoted to improve the grass root level awareness and promotion of digitalized services including m-health.

Such an integrative process should be a collaborative engagement of all stakeholders including the Ministry of Health, Ministry of Information and Broadcasting, Ministry of Education, etc. in India.

LIMITATIONS

The study is a cross-sectional google form survey, a limited exploration of reasons for low awareness and usage.

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