Section: Community Medicine

Original Research Article

UTILIZATION PATTERNS OF HEALTH APPS AMONG MEDICAL AND PARAMEDICAL STUDENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: The integration of mobile technology into healthcare has led to the exponential growth of mobile health (mHealth) applications, which are now pivotal tools for health promotion, disease prevention, and management of chronic conditions. Health apps, defined as mobile software applications that provide health-related services, have gained significant traction among younger populations, particularly students, due to their accessibility, convenience, and potential to support self-care behaviors. **Objectives:** To evaluate the utilization of mHealth apps among medical and paramedical students. To determine the association of the usage of mHealth applications with demographic details among students. To identify potential barriers to effective app usage with these digital tools.

Materials and Methods: A stratified random sampling technique using population proportionate allocation was employed. The study population was divided into three strata based on course type (medical, nursing, and allied health sciences). The total sample size of 372 was proportionally allocated to each stratum. Within each stratum, systematic random sampling was used to recruit participants until the required number from each group was achieved. The final sample combined participants from all strata to reach the total sample size.

Results: The mean age of students is 20.02 ± 2.8 years. The proportion of males is 37%, and the proportion of females is 62.9%. A total of 420 responses were obtained. 27.4% of participants were reported to be using health tools for managing their health. The majority of them are using fitness tracking (47%), followed by diet and nutrition tracking (32%).

Conclusion: The study revealed that while only 28% of participants utilized health tools for managing their health, fitness tracking was the most preferred feature.

Keywords: Health apps, mHealth, medical students.

INTRODUCTION

Health interventions are particularly important as they provide a foundation for an active lifestyle.[1] The utilization of mobile health (mHealth) apps has gained substantial attention for their potential in promoting lifestyle modifications among various populations.[2] Mobile health (mHealth) applications represent a promising technology for individuals to monitor and control their health in an accessible and cost-effective manner, given their widespread use and affordability. These apps offer tailored interventions aimed at addressing specific health concerns through personalized messages, interactive features, and behavioral metrics tracking.[3] They can support crucial behavioural change techniques, such as goal setting, performance monitoring, and feedback, which are considered fundamental "active"

components capable of influencing or altering behavior.[3] Emotional factors like hedonic motivation, along with habit, social influence, and trust in the app's reliability, have been identified as important predictors of intention to use mHealth apps.[2]

Investigating the utilization of health apps among medical and paramedical students is particularly relevant. This population comprises future healthcare professionals who are not only potential users of these technologies for their personal health but may also play a fundamental role in educating individuals or integrating mHealth tools into clinical practice.

MATERIALS AND METHODS

A cross-sectional study was conducted from November 2024 to January 2025 at Sri Venkateswara Medical College among undergraduate and postgraduate medical students and paramedical UG students using a pre-tested structured questionnaire through Google Forms. In a study conducted by Singh et al., 59% of the medical students were using health apps on their smartphones, with a confidence level of 95% and an absolute error of 5%; the sample size was 372. A stratified random sampling technique using population proportionate allocation was employed. The study population was divided into three strata based on course type (medical, nursing, and allied health sciences). The total sample size of 372 was proportionally allocated to each stratum. Within each stratum, systematic random sampling was used to recruit participants until the required number from each group was achieved. The final sample combined participants from all strata to reach the total sample size. UG, PG, and paramedical students who are willing and available to participate in the study were included in the study, and Students who had not responded after two to three reminders/requests were excluded from the study. The collected data was entered in an MS Excel spreadsheet and analyzed by using EPI-INFO software version 7.2.5. The data will be expressed in proportions and means. Tables, bar diagrams, and pie diagrams will be used to represent the data. The chi-square test was used to compare the difference between proportions. Paired t-tests and Student's t-tests were used to find differences in means of paired measurements and independent groups, respectively. A p-value less than 0.05 was considered statistically significant.

RESULTS

The mean age of students is 20.02 ± 2.8 years. The proportion of males is 37%, and the proportion of females is 62.9%.

Table 1: Distribution of study participants according to strata

Strata	Attained sample (n=453)
PG medical	81
UG medical	112
UG paramedical	260

Of the attained sample, according to population proportionate sampling, 81 students were PG medical, 112 students were UG medical, and 260 students were UG paramedical.

Table 2: Age distribution of study population

Designation (N=453)	Age in years (μ±S.D)
PG Medical (n=81)	27.0 ± 5.0
UG medical (n=112)	19.4 ± 1.3
UG paramedical (n=260)	20.1 ± 1.1

PG medical students were 81, and the mean age was 27.0±5.0 years; UG medical students were 112, and the mean age was 19.4±1.3 years; and UG paramedical students were 260, and the mean age was 20.1±1.1 years.

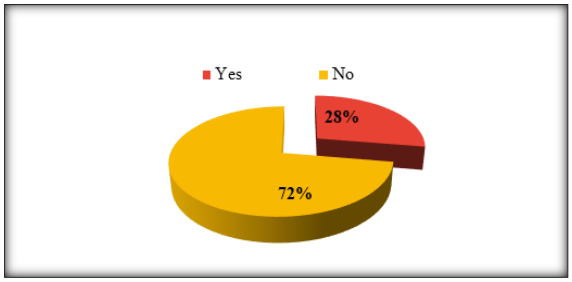

Figure 1: Percentage of mHealth app usage among study population (N=453)

28% of the study population were using health apps, and the other 72% of the study population didn't use any health apps.

Of the 125 using health apps, the majority of the students use fitness trackers (47%); of them, UG medical students were 58%, PG medical students were 32%, and paramedical students were 10%. The second most used tool was for tracking diet and nutrition (32%); of them, UG medical was 45%, PG medical was 33%, and paramedical was 22%. Followed by sleep tracking (12%), of them UG medical were 65%, PG medical were 13%, and paramedical were 22%. [Table 3]

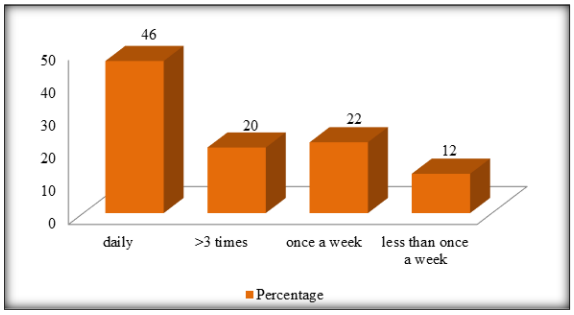

Figure 2: Distribution of mHealth app users according to frequency of usage

Of 125 students using health apps, the majority of the students (46%) use health apps daily, 20% of them use them >3 times a week, and 22% of them use them once a week.

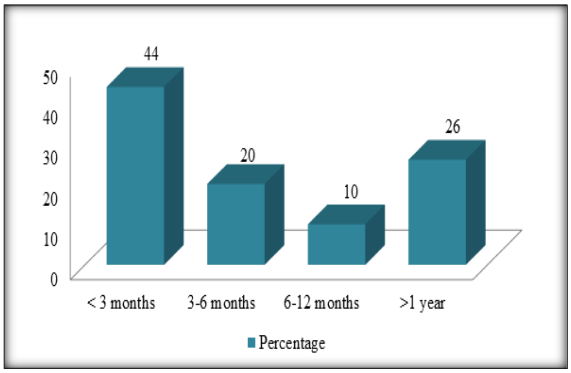

Figure 3: Distribution of mHealth apps users according to duration of usage

The majority of the students started using health apps in <3 months, 20% from 3-6 months, and 26% of students have been using them for >1 year.

Table 4: Demographic association with usage of health apps

Variable	Health tools usage		Test value	P-Value*
	Yes	No		
Age in years (μ±S.D)	20.3 ± 3.1	19.9 ± 2.7	0.05	0.203
Gender				
Male = 168 (%)	42(25)	126(75)	0.05	0.325
Female n= 285(%)	83(29)	202(71)		
BMI (μ±S.D)	23.3 ± 1.0	23.2 ± 1.2	0.05	0.814

**Unpaired T test for continuous variables and chi-square for categorical variables*

The mean age of students using health apps was 20.3±3.1 years, and the mean age of students not using health apps was 19.9±2.7, and there is no statistical significance between the two groups. There was no statistical significance in gender and BMI of the two groups.

Table 5: Barriers in mHealth app usage

Challenges	UG Medical n (%)	PG Medical n (%)	Paramedical n (%)	Total n(%)
Lack of motivation	30 (63)	15 (30)	3 (7)	48(41)
Cost of subscription	11 (48)	2 (9)	10 (43)	23(21)
Difficulty understanding data	15 (75)	3 (15)	2 (10)	20(15)
Technical issues	13 (68)	3 (16)	3 (16)	19(14)
Privacy or data security	6 (50)	1 (8)	5 (42)	12(9)

The majority of the students (41%) felt that lack of motivation being the barrier of using health app. 63% were UG medical, 30% were PG medical, and 7% were paramedical. Followed by 21% felt that cost of subscription is the barrier for them. 48% UG medical, 9% were PG medical, and 43% were paramedical. Difficulty in understanding data, technical issues, and privacy or data security are other barriers to using health apps.

DISCUSSION

The mean age of students using health apps is 20.2 years, similar to the study done by Singh et al. (2019), which included 2nd- and 3rd-year medical undergraduates with a mean age of 20.2 years.[5]

In our study the prevalence of usage of health apps is 28%, similar to the study by Sayedalamin et al. (2016) in Saudi Arabia, involving medical students, where 27% were using these medical apps at least once a day. 6 In contrast, another study in Vietnam (2018) found that 14% of smartphone owners used health-related mobile apps.[7]

My study finds that fitness trackers are the most used health tool among students (47%); similarly, in a study done on Vietnamese youth, it was indicated that fitness, weight management, or tracking health apps were preferred most.[7] In study done by Shalini et al., it was found that nutrition applications were more preferred. Access to personalised data on behaviours like physical activity and the ability to track, compare, and monitor behaviour are suggested to have potential for impacting cognitions and emotions

and increasing activity levels. 8 Tracking diet and sleep are forms of self-monitoring and performance monitoring that can be supported by these apps.[9] Given that students in this demographic are less likely to have multiple chronic conditions compared to older populations, their usage might predominantly focus on health promotion and prevention through lifestyle tracking and management.[10] Even in the present study there is no significance with gender, while other studies concerning gender suggest that users of mHealth apps are often female. 2 Students have potentially higher digital health literacy and health awareness, and shared academic environment could mean that these demographic and physical factors play a less significant role in determining health app adoption compared to their relevance in the general population or other student groups.[10]

In the present study, we found that the majority, 41%, of the students have a lack of motivation as the barrier to using health apps, and a study done by Kerner et al. (2017) indicated that wearable healthy lifestyle technology may have negative motivational consequences in adolescents. This was linked to significant reductions in need satisfaction and autonomous motivation and increases in amotivation over time.[11] Inanother study, Alotaibi et al. (2025) found that both ability and motivation play a positive role in the adoption and behavioral intention of digital healthcare by influencing performance expectancy.[12] In the present study, 20% of the students found understanding data as a barrier, and another study identifies usability issues and the complexity of use as significant barriers to technology acceptance.[12] Similarly, another study by Verweij et al. (2022) mentions that aspects of the innovation not being user-friendly were identified as barriers.[13] Health apps hold promise for promoting positive behaviour change using features like reminders, progress tracking, and gamification. Integrating digital health literacy training to ensure future professionals use these tools both personally and in patient care.

Limitations

Being a cross-sectional study, it captures data at a single point in time, limiting the ability to establish causal relationships or assess changes in health app usage over time. The reliance on self-reported responses may introduce recall bias or social desirability bias, leading to underreporting or overreporting of app usage and behaviors. The study is confined to students from a single tertiary care teaching hospital, which may limit the external validity and generalizability of the findings to other regions, institutions, or non-healthcare student populations.

CONCLUSION

This study reveals that 28% of medical and paramedical students actively use mHealth applications, indicating a moderate level of adoption within my study population. The analysis of demographic factors doesn't demonstrate associations between app usage patterns and variables such as age, gender, and academic year, underscoring the need for targeted interventions to optimize engagement. While health apps have the potential to support lifestyle and behavioral modifications, several barriers hinder their effective utilization. The most frequently reported challenges were lack of motivation, cost of subscription, and difficulty in understanding data.

Recommendations/Further research

Conduct targeted awareness campaigns through workshops and seminars to educate students about the utility and effectiveness of health apps. Improvement in the design of digital health interventions, suggesting that addressing barriers could enhance user engagement and overall health outcomes. Collaborate with fields such as behavioral sciences and technology development to understand how digital health tools can be optimized for student learning and professional growth. Future research should focus on longitudinal assessments to evaluate the sustained impact of mHealth adoption and explore strategies for improving user experience and trust in these applications.

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