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Understanding the inclination of South Indian nursing graduates in using mobile learning applications

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Abstract:

BACKGROUND: Clinical-based mobile learning courses have great demand among the nursing graduates as learners look for possibilities to update skills. The present study explores the feasibility, familiarity, utility, and attitude of nursing graduates of South India toward mobile learning applications (m-apps).

MATERIAL AND METHODS: An online-based cross-sectional descriptive survey was conducted in May 2021 among the South Indian nursing graduates of Tamil Nadu and Kerala, using a questionnaire consisting 49 items categorized under six sections with items related to socio-demographic information; m-app usage; online learning experience; preference in using m-apps for learning purposes before COVID-19 and during COVID-19; students' engagement through e-learning; and anxiety related to online assessment. Descriptive and inferential (ANOVA, Chi-square, and t test) statistical data analysis were done using SPSS version 23.

RESULTS: A total of 447 student nurses responded. The result shows that most of them, 96% (432) used android phones and 94% (422) owned a mobile. Age was highly influencing mobile learning application (m-learning apps) usage; students of less than 20 years of age used applications more frequently and possessed more educational applications. Majority of them, 84% (377) of them had started using m-learning apps only after COVID. 57.7% (249) commonly used m-learning apps for acquiring nursing knowledge resources, nursing exam preparatory, and drug resources. Students rated high for the interactive nature of these m-learning apps, while abundant learning materials and usage with ease were rated as other attractive features. Sixty-six percent (305) had mostly downloaded these apps from Google Play Store.

CONCLUSION: The findings would help the m-learning application developers to offer customize solutions to address learning gaps that prevail among the South Indian nursing graduates and help with sustainable growth.

Keywords:

Attitude, feasibility, mobile learning applications (m-learning apps), South Indian nursing graduates, utility

Introduction

The shift from classroom learning to online learning has made it possible to utilize various digital platforms that have been less used earlier. Online learning has a good response and better satisfaction among the tertiary level learners.^[1] On a comparative note with traditional methods of learning,

many studies have favorably reported that online platforms are effective in engaging the learners with wealth of knowledge. Since the learning happens at their convenient pace, the learners are likely to feel better motivated.^[2] It has also brought learners closer to teachers all around the world. It has paved the way for sharpening of the distinctive ability to pursue self-learning and self-regulatory learning behavior among the learners at a short span.^[3,4]

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Mobile phones being the common device available with most of the learners,^[5] developing mobile educational applications could be an ideal option among the various digital platforms for imparting knowledge. Mobile phones are very convenient, easy to carry, and readily integrated into a user's routine.^[6,7] The transition of education institutions to remote learning mode has further made many students use their phone for taking lessons.^[8]

A statistic on e-learning mobile app usage released on March 3, 2022 by Appsquadz,^[9] a mobile application development company in India indicates a 27% increase in the mobile-only users than 14% desktop-only users with 65% media usage every day. These changes have led to a booming number of mobile application developments in recent years.^[10,11]

Mobile learning applications (m-learning apps) have helped to expansively explore opportunities to develop learning content in the field of nursing education.^[12] Many nursing clinical-based digital courses have great demand among the nursing graduates.^[13,14] The effectiveness of m-learning apps in clinical practicum learning has shown a better quality of learning outcome.^[15] Significant positive impact was noted in critical thinking, self-efficacy, and self-regulated study behavior among the m-learning apps users of medical science postgraduates from southeast of Iran.^[16] Sarani^[17] reiterates similar results among the deputy's administrative staff of Kerman University of Medical Sciences with better retention and improved performance.

A self-reported study on mobile application shows better satisfaction, notable progress, improvements in knowledge and confidence, and reduced levels of anxiety around learning in practice.^[18] Studies have proven improvement in self-efficacy and clinical performance among the nursing students through educational workshops.^[16] A study using mobile learning intervention by Chen^[19] among the nursing graduates showed significant improvements in nursing skills, knowledge, and better satisfaction compared to traditional approach.

Nursing, a profession strongly built on clinical skills, requires lifelong learning.^[20] COVID-19 has illustrated the need to upgrade clinical skills to handle unheard or unseen cases.^[21] The fear of irreversible flaws due to the lack of knowledge was self-reported as one of the major stressors by frontline nurses assigned for the care of COVID cases.^[21,22] However, the pandemic closure of nursing institutions has led to a huge deficit of direct clinical practice.^[23] With the lack of opportunities in real life, many nursing graduates have resorted to exploring the possibility of acquiring the necessary skills through

online mode. M-learning apps have been a preferred method for acquisition of clinical skills.^[24]

Although the COVID-19 pandemic has given way for favorable transitions in education, the unprepared sudden transformation from traditional to virtual mode has also been a painful process for learners especially from developing countries. Lack of training and limited or no previous exposure has posed unprecedented challenges on learners from developing countries to cope with difficulties in adapting to the process.^[23,25,26]

M-learning apps are mostly developed in technologically advanced countries like Europe, the USA, and in parts of East Asia.^[27] Low-end models with limited functionality such as incompatibility to support the video and audio formats, no standard screen size and resolution, limited memory sizes, and low-bandwidth or limited wireless communications infrastructure re observed.^[28] The highly accent speech and verbal complexity of the learning content produced by these native English speakers could make it difficult for learners from non-native speaking countries to comprehend. Similarly, some of these digital tools come with high pricing.^[29,30] Students from developing countries may face financial obstacles such as purchasing access to these resources.^[31]

Keeping these in mind, it is essential for the educators and application developers with developing countries as their target market to study the true picture that prevails among the target users. Understanding these determiners helps developers to make wise decisions while developing m-apps for learners from developing countries. Samoekan Sophonhiranrak^[22] insists on the need for surveying on the available mobile devices as an important step in the development of mobile applications. This can help in creating customized solutions. Studies also point to those mobile applications that fail to meet the expectations of the learners who will have less intention to use them.^[32]

India is one of the leading developing countries with nurses forming two-thirds of its health workforce. Tamil Nadu, the South Indian state, is the leading contributor to the world nursing force next to Kerala. The promising career, predominance of women's preferred profession, and immigration opportunity have still been attracting many from the low socioeconomic and rural background of South India.^[33]

A survey^[34] on e-learning feasibility and Indian nursing students' perceptions insist the need to strengthen the infrastructure to help in the emergence of redefined nursing graduates as e-learners from the pyre of COVID. The Ministry of Skill Development and Entrepreneurship (MSDE)'s initiative of training

and global placement of health workers from India substantiates the need for a flexible and easily accessible online mode of learning to reach the Indian nursing graduates from rural and remote areas. It is also considered to be a relatively cheaper mode of education in terms of the lower cost of transportation, accommodation, and the overall cost of institution-based learning.^[35]

Nevertheless, the literature in Indian context, exploring the attitude and perception of using m-learning application, is very limited. Of the total number of hits from Google Scholar database, only one study done among the resident doctors from North India^[36] showed up, yet no such study was found among the South Indian nursing graduates. In other words, a clear understanding of the South Indian nursing graduates m-learning experience and inclination can help in developing cost-effective m-learning applications.

Objectives: The main objective of the study is to explore the feasibility, familiarity, utility, and attitude of the South Indian nursing graduates from the states of Tamil Nadu and Kerala toward using m-learning apps and the secondary objective is to understand the COVID-19-induced recent transition in using m-learning among these South Indian nursing graduates.

Materials and Methods

Study design and setting

This online-based cross-sectional descriptive study design was conducted in May 2021. All suitable nursing graduates attending college located either in Tamil Nadu or Kerala were approached to take part in the study.

Study participants and sampling

Open Epi software was used for determining the sample size.^[37] Keeping the response rate at 50%, confidence interval at 95%, and population size of 1400, the sample size was calculated as 302. The nursing graduates from six colleges from the South Indian states, Tamil Nadu and Kerala, participated. A total of 447 nursing students completed the survey.

Data collection tool and technique

Based on reviews, the researchers developed an online survey questionnaire consisting of 49 items categorized under six sections.

Content validity of the tool: Content validity test helps to understand the accuracy of the tool in measuring the expected variables. Here, the tool is intended to understand the mobile application (m-app) usage; online learning experience; preference in using m-apps for learning purposes before COVID-19 and during COVID-19; students' engagement through e-learning;

and anxiety related to online assessment. Experts from Nursing (1 no), English (1 no), Computer (1 no), and Psychology (1 no) were approached to scrutinize the tool for chances of ambiguity.

Reliability test of the tool: A reliable tool should have stability and reproducibility. The most common way to identify them is to conduct the inter-rater test. *The Inter-Rater Test* for agreement among the experts in identifying the statements as relevant was carried out with experts and analyzed using the statistical analysis of Cohen's Kappa. Experts from Nursing (1 no) English (1 no), Computer (1 no), and Psychology (1 no) with PhD degree, ranking not less than Asst. Professors who had research experience were approached for assessing the tool for its reliability. A scale of "Highly Relevant," "Relevant," "Needs Modification," and "Irrelevant" were fixed for all the 49 items in the tool and the experts were asked to grade them. Then, grades were statistically analyzed for its quality of common agreement. The details are as follows,

Symmetric measures of common agreement				
	Value	Asymp. std. error ^a	Approx. T ^b	Approx. Sig.
Measure of agreement Kappa	0.701	0.012	5.122	0.000
No. of valid cases	49			

^aNot assuming the null hypothesis. ^bUsing the asymptotic standard error assuming the null hypothesis

The analysis shows that all the 49 items had a significant value of .701 and had substantial agreement. Therefore, all the items were accepted.

Tool Description: The 49 items of the tool cover aspects grouped under the following five sections

Section 1: Items related to socio-demographic information (age, gender, college, and name of the program, state, and place of residence, family monthly income, year of study, gadgets used in e-learning, and sources of the internet).

Section 2: Items related to mobile application usage such as number of apps in use, purposes of the apps, features that select apps, educational apps in nursing, how long are they using and how frequency of usage, and which source did they use to download the app.

Section 3: Items related to online learning feasibility such as mode of learning preferred by students, type of internet connection, internet connection speed on a scale of 1 to 10, availability of free internet connections and separate place/room at home to attend online class, problems related to learning through online, nature of the problem(s), frequency use of mobile phone, owning of phone, type of mobile phone, and space to download

apps. In this section, eight items were grouped to calculate feasibility of using mobile app total score that was 20.

Section 4: The preference for using mobile apps for learning purposes before COVID-19 lockdown and during COVID-19 lockdown was asked in a five-point Likert scale with a score range of 0 for "Never" and 4 for "Always." The e-learning preference was evaluated by binary (yes and no) responses using nine items. The total score was 24.

Section 5: Students' engagement or acceptance of e-learning was assessed using the Likert scale from 0 to 4 (0 = Never, 4 = Always). Total score was 31. Total items were five and grouped as interesting level, understanding level, level of satisfaction, able to seek help to clear doubts, and able to interact with teachers.

Section 6: Anxiety related to online assessment on a scale of 1 to 10 and recent improvement in academic performance.

Data analysis and score calculation: Data analysis was done using SPSS version 23. No scores were allotted to sections 1 and 2 of the questionnaire. The data under these sections were used for descriptive analysis. For sections 3 to 6, the mean score was arrived at by calculating the sample population's mean score. For section 3, the mean score above population mean was considered as feasible, while the mean score below population mean was considered as not feasible, similarly, for section 5, the mean score above population mean was considered as accepting e-learning, while the mean score below population mean was considered as not accepting e-learning, and similarly, in section 6, the mean score below population mean was considered as less and more anxious related to online assessment. Chi-square tests were used to compare categorical variables. Binary logistic regression was used to predict the association between e-learning readiness and students' engagement or acceptance/anxiety/age/gender/place of residence/income/state; two-tailed P value < 0.05 was considered significant.

In section 4, 11 items were divided into three sub-topics such as views on e-learning, preference for using mobile apps for learning before COVID-19 and after COVID-19. Based on population mean score, the topics were classified as positive view, negative view, preferred and not preferred to use mobile applications. The mean score above population mean was considered as definitely ready, whereas mean score below population mean was considered as definitely not ready.

Based on population mean score of section 5, sub-topics were classified as interesting, not interesting,

understanding, not understanding, satisfied, not satisfied, able to seek help to clear doubts, not able to seek help to clear doubts, able to interact with teachers, and not able to interact with teachers. Similarly, in section 6 less and more anxiety related to online assessment. Chi-square tests were used to compare categorical variables. Binary logistic regression was used to predict the association between e-learning readiness and students' engagement or acceptance/anxiety/age/gender/place of residence/income/state; two-tailed P value < 0.05 was considered significant.

Data collection technique: The survey was shaped in Google forms and piloted on a sample of 25 students attending Allied Health Programs and who belonged to the same age demographics of the sample group. The nursing students were exempted from piloting so that they need not be excluded from the main study. Feedback received from the students who were involved in the pilot testing was used to modify the survey. The online questionnaire was shared by the researchers with the college students via e-mail and requested them to participate in the study. After the initial email, three more reminders were sent to students through WhatsApp every week for one month.

Ethical consideration

Ethical clearance approval for the conduct of study was obtained from the Institutional Ethics Committee of a deemed university attached to a teaching hospital which runs nursing programs with a nursing students' strength of 1400 (Ref.No.IEC-NI/21/FEB/77/14).

Results

The demographic details of the students who participated in this study are as shown in Table 1.

More than half, 64% (286) of the samples were in the age group of 17–20, with a dominant female population of 86% (387). Almost an equal number of urban 38% and rural 47% were present. Similarly, almost an equal number were from the two different South Indian states, 58% (258) were from Tamil Nadu and 42% (189) were from Kerala. Nearly 65% fell into the category of less than Rs. 20,000 family income groups. A majority of these participants were pursuing basic B.Sc. Nursing program.

Our study shows that 95% (426) used mobile phones for e-learning. Frequency of mobile usage for learning shows that 47% (209) always used mobile while 42% (187) used them sometimes. As our focus was to understand the feasibility to use mobile applications, we wanted to know more about their mobile phones. Most of them, 96% (432) used android phones and 94% (422) owned a mobile. When asked whether the mobile had enough

Table 1: Socio-demographic characteristics of the respondents (n=447)

Variables	Frequency	Percentage
Age of the respondents (Mean age: 21)		
17-20	286	64.1
21-30	158	35.3
31-45	3	0.7
Gender		
Female	387	86.6
Male	60	13.4
Residence		
Rural	208	46.7
Semi-urban	69	15.4
Urban	170	37.9
Monthly family income (NRs)		
20-40 thousand	119	26.8
40 thousand and above	35	7.8
<20 thousand	293	65.4
State		
Kerala	189	42.4
Tamil Nadu	258	57.6
Name of the program		
Basic B.Sc. Nursing	409	91.3
Diploma in General Nursing and Midwifery	20	4.5
M.Sc. Nursing	2	0.7
Post basic B.Sc. Nursing	16	3.6
Gadgets used		
Mobile	426	95.1
Computer	10	2.2
Laptop	12	2.7
Source of internet		
Wi-Fi (wireless fidelity)	55	12.5
Telephone line	29	6.5
Data card	344	76.8
Hotspots	19	4.2

storage space, 46% (205) stated that they had a space shortage while an equal number of 24% (120–124) stated yes or expressed uncertainty.

Apps usage details

Nearly one-third of the students, 30% (134) had a minimum of 10 apps installed on their mobile devices, while 10% (45) had eight apps and around 60–65 (15%) had five to six apps and only a bare minimum of 1% (6) had no apps installed on their mobile devices. Majority of them, 377 (84%) of them have started using mobile apps only after the COVID. Sixty-six percent (305) of the participants have downloaded these apps from Google Play Store. When students were informed to mention the purpose of app usage, nearly half of the students' sample, 57.7% (249) mentioned the purpose of learning, while the remaining 42.3% (198) expressed various other purposes such as social entertainment, leisure time alternate, and out of which a minimum of 12% (55) mentioned the fun mode. These findings reveal that a maximum number of usages were for educational purposes which show

that students have positive attitudes toward the use of mobile apps for learning. In relation to the frequency of app usage, half of the samples, 51% (233) stated that they used these apps on a daily basis, 74 used at a weekly frequency, and an equal number of 61 had either used it either monthly or rarely.

Almost two-thirds of the students stated that they used mobile apps for educational purposes 69% (311). Among the educational apps that were most used, Google Meet, Zoom, etc., were commonly listed as used for attending online classes 72% (223). Only few of the students were aware about educational apps in nursing, 28% (87). Three types of nursing apps were mentioned, the first was for nursing knowledge resource apps 50% (44) such as Medscape (17), Byju's Midwifery (27), and Medscheme (5), the second type included nursing exam preparatory apps 24% (21) such as NCLEX Q Bank (4), Nursing Next live (13), and Nursing Exam (4), and the third type included apps for drug resources 26% (23) such as CIMS India (14) and PEPID for drug consultations (9). Students rated high, 73% (64) for the interactive nature of these apps, while large storage of learning materials 17% (15), and usage with ease (9) were rated as other attractive features of these apps.

Our study result shows that gender was not associated with apps usage such as number of apps, educational apps usage, and frequency of using apps, while family income was associated with frequency of using apps ($\chi^2_s > 10.67$, $df = 4$, $P's < 0.031$); low socioeconomic students used less frequently. Possessing apps was not influenced by family income. Age was highly influencing apps usage such as number of apps ($\chi^2_s > 10.26$, $df = 2$, $P's < 0.006$) and educational apps usage ($\chi^2_s > 12.40$, $df = 1$, $P's < 0.000$); students of less than 20 years of age used apps more frequently and possess more educational apps. The nursing graduates from Tamil Nadu state possessed more number of apps than Kerala ($\chi^2_s > 14.32$, $df = 2$, $P's < 0.01$), using educational apps ($\chi^2_s > 12.40$, $df = 1$, $P's < 0.000$), and more frequently used apps ($\chi^2_s > 11.41$, $df = 2$, $P's < 0.003$); similarly, area of residence (domicile—urban/rural) also highly influenced apps usage.

E learning perception [Table 2]

Availability of good infrastructure is very essential in effective learning. Considering the e-learning feasibility, the majority of the students preferred, 81.3% (365) face-to-face learning, a minimum of 10.5% (47) of students chose online class and 8.2% of students preferred self-learning. With regard to the type of internet connection, the maximum number of students, 76.8% (345) used mobile data to listen to online classes and only 12.5% (56) had access to Wi-Fi routers at home. Very few students used hotspots 3.3% (15) and 6.5% (29)

Table 2: Overall perception and category-wise responses of students toward e-learning n=382

Variable	Responses	n (%)	Mean	Std. deviation	Std. error mean	P
Feasible to use mobile app	Feasible	193 (43)	20.00	1.54	0.111	0.000
	Not feasible	254 (57)	16.06	1.80	0.112	
e-learning view	Positive	256 (57)	19.9	2.2	0.146	0.001
	Negative	191 (43)	15.2	1.7	0.127	
Preference of using mobile apps before COVID-19	Preferred	269 (60)	4.21	0.612	0.037	0.000
	Not preferred	178 (40)	2.00	0.000	0.000	
Preference of using mobile apps after COVID-19.	Preferred	301 (67)	3.85	0.524	0.030	0.000
	Not preferred	146 (33)	2.00	0.000	0.000	
How interesting are the class sessions online?	Interesting	213 (47)	2.10	0.299	0.020	0.000
	Not interesting	234 (53)	0.71	0.454	0.030	
Level of understanding of lessons learnt through online	Good understanding	275 (61)	7.37	1.162	0.095	0.000
	Poor understanding	172 (39)	4.06	1.257	0.070	
Level of satisfaction of lessons learnt through online	Satisfied	261 (58)	7.33	1.098	0.068	0.000
	Not satisfied	186 (42)	4.04	1.266	0.092	
Level of help to clear doubts while learning through online sessions	Able to seek help	184 (41)	4.12	0.519	0.038	0.000
	Not able to seek help	263 (59)	2.00	0.000	0.000	
Level of interaction with teachers during online sessions	Able to interact	218 (49)	3.89	0.565	0.000	0.000
	Not able to interact	231 (51)	2.00	0.000	0.038	
Level of anxiety related to online assessment	Less anxious	229 (51)	4.66	1.372	0.091	0.000
	More anxious	220 (49)	8.09	1.092	0.074	
Level of improvement in academic performance	Improvement	191 (43)	3.00	0.000	0.000	
	No improvement	258 (57)	1.64	0.481	0.030	

land connection. Significant association was found between family monthly income and type of internet connection ($\chi^2 = 21.32$, $df = 8$, $P < 0.006$); however, there is no association between type of residence and type of internet connection. Only a minimum percentage of students had (35%) adequate internet connection speed, most of the students reported (65%) poor internet connection speed. 88.2% of students have access to free internet connections. A small portion of students had a separate place/room at home to attend online classes (28.5%). Almost all students had some (98%) problems related to learning through online. Nature of the problem described by the students were technical issues by half of the students (50%), 40% of students mentioned no issues, only 10% of students reported health issues such as eye pain and headache.

Discussion

The main objective of the study is to explore the feasibility, familiarity, utility, and attitude of the South Indian nursing graduates from the two states of Tamil Nadu and Kerala toward m-learning applications. With regard to feasibility, the present study reveals that 95% (426) of the nursing graduates used mobile phones for e-learning and very few only used laptops and tablets; similarly, Harerimana,^[38] in her study on mobile technologies use among the undergraduate nursing students in South Africa, found that more participants owned smartphones (87.6%), followed by laptops (76%) and tablets (47.1%). Only half the students felt it was feasible (43%) to use mobile apps

for learning purposes; these findings related to the study findings of Sheikhtaheri,^[39] on willingness of mobile apps among the nursing and medical students and found only 40% felt feasible.

Although many sample respondents said they used their smartphones for educational purposes, they said they used them more often for pleasure. When they felt stressed, anxious, or bored, it helped them relax. This concept was found by two studies done by Baral^[40] and Ayar.^[41]

The barriers identified in this study were poor internet connection speed (77.1%) and lack of mobile storage space for new app installation, 46% (205). This is similar to a survey result on Indonesian students' perceptions of their online learning during the pandemic which showed that 84.8% of students used android phone to join the online learning; however, due to the limited phone memory, many at times, they were forced to reinstall applications.^[42] Carlson^[43] shows the implementation and continued use of mobile phone in evidence-based practice among the nursing graduates. Others three studies done by Al-Azawei,^[44] Subedi *et al.*,^[45] and Almaiah *et al.*^[46] also support the findings of the study.

Nearly half of the samples, 46% (205) have stated lack of space to download new applications. Insufficient storage space could be attributed to the limited storage space of the basic model of android phones that most learners owned (65%). Cloud-based mobile applications could be a better solution to storage problems. In case of

hardware failure or malfunctioning, learners can have access options from other devices. It also saves battery lifetime.^[47]

With respect to attitude, the present study shows that around half of the students had a favorable attitude of how effective e-learning was. This is in line with research conducted in Pakistan and Nepal.^[48,49] Students reported that it freed up their time and made it easier for them to access educational resources. However, the majority found that other teaching and learning methods would never be totally replaced by e-learning. Nearly half of the nursing students participated in a study to better understand the difficulties of e-learning, and they all agreed on the value of integrating e-learning into nursing curricula.^[49]

Understanding the students' perspective of online studies showed that the majority of the students, 81.3% (365) preferred face-to-face learning which was similar to findings of Agung's^[42] on Indonesian students with 66.7% of them were not enthusiastic about having online learning. 35.2% learners found online classes as effective and Abbasi *et al.*,^[50] found that 77% students have negative perceptions toward e-learning. Similar to a study conducted by Yazdannik *et al.*,^[51] it was discovered in the current study that 261 (58%) participants are extremely satisfied with online learning.

Almost two-thirds of the students stated that they used mobile apps for educational purposes 69% (311) and identified smartphones as effective learning devices. This was congruent with the study by Chandran^[52] on the effectiveness of smartphone applications in improving academic performance. The study identified mobile phones as an effective tool that contributed to a significant improvement in the knowledge level of the participants and effective adjunct tools in medical education for its low expense, high versatility, reduced dependency on regional or site boundaries, online and offline, simulation, and flexible learning features of mobile apps.

Our study also points out areas of residence (domicile—urban/rural) highly influenced apps usage. Students from rural domiciles lacked or had limited learning exposure to the application. This could be due to the non-availability of better professional support that could create awareness about application availability and lack of technical support as a good internet network, better internal signal strength. Hamid's^[53] domicile-based study on challenges encountered during COVID-19 suggests that insufficient internet network facilities to be the common problem encountered by the students away from the cities. Considering such learners' heterogeneity in countries like India, giving good infrastructural support to students from rural places to access online learning will make e-learning effective.

Our findings point to a favorable response between COVID-19 and better technology acceptance among the learners from developing countries. Majority of them, 377 (84%) have started using mobile apps only after COVID-19 out of which 57.7% (249) have used learning apps. Similar e-learning acceptance and its positive impacts on students' academic performance were observed by Alhumaid^[54] in the Education Ministry of Pakistan during COVID-19 lockdown situation in spite of weak infrastructure.

Strength of the study

The present study could be considered as the first of its kind to explore the South Indian nursing graduates' inclination to use m-learning applications.

Limitations and recommendation

The present study evaluated the responses of the nursing graduates who voluntarily participated; however, only a few colleges from the two South Indian states, Tamil Nadu and Kerala, took part. Considering this, the future study can include a large sample size from more colleges. Similarly, the perception of students could present bias as participants from the two states were not matched for uniformity.

Conclusion

M-learning applications are not an entirely new concept for nursing education. However, the successful launch of the m-learning highly depends on the clear understanding of the users' e-learning experience. The present findings will help application designers whose target users are nursing graduates from India to tailor-make their applications as per the needs and bring solutions to address learning gaps. It will also create a great scope for converting many traditional classroom learning contents to m-learning experience for a wider reach. Future studies with longitudinal methods can be undertaken to understand further change in attitude.

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Conflicts of interest

There are no conflicts of interest.

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