Journal for Re Attach Therapy and Developmental Diversities
eISSN: 2589-7799
2023 August; 6 (9s): 1209-1218

Psychological Effect of Mobile Learning on the Performance and Attitudes of Nursing Students during Covid-19 at Nursing College, King Khaled University

Alqarni Aida Sanad
Assistant Professor of Medical Surgical Nursing Department, College of Nursing, ABHA, King Khalid University
*Corresponding Author: Alqarni Aida Sanad
aidaalqarni@kku.edu.sa

Received: 24- June -2023
Revised: 27- July -2023
Accepted: 21- August -2023

Abstract

Background: The appearance of COVID19 virus obligated the world to remote learning. Mobile applications are one of the most accessible methods. The study is done to evaluate how mobile learning can affect both performance and attitudes of students in the nursing field.

Study design and subjects: an interventional study included 70 third-years nursing students enrolled in the study by using simple random sampling technique. Two groups were obtained by dividing the sample in to study group using mobile and control group which depend on the traditional methods.

Setting: The study was carried out at College of Nursing, ABHA, King Khalid University, Kingdom of Saudi Arabia. Three data collecting tools used in this study including questionnaire about the knowledge, the student clinical evaluation checklist, and the attitude scale toward mobile learning.

Results: the intervention group achieved a satisfactory knowledge level (85.7%) but control group nursing students had an unsatisfactory knowledge in about (65.7%). About half of nursing students who used mobile during their learning process received excellent+ and excellent grades,(34.3% and 20%, respectively), compared to 14.3% and 5.7% of those taught using traditional clinical sessions. A bout (97.1%) was found to have a positive attitude regarding the learning through mobile.

Conclusion and Recommendation: mobile educational applications were a useful learning tool for enhancing practice and knowledge. The positive attitude reported toward using the mobile in learning highlights the need for adding more mobile-based applications in the curriculum to enhance learning of undergraduate nurses. In addition we need more incorporation of modern technologies including mobiles into all fields of education either theoretical or practical.

Keywords: *Attitude, Covid-19, Mobile learning, Nursing students, Performance*

Introduction

The process of nursing education involves teaching both theory and practical skills. Nursing education's main goal is to produce competent nurses (Kim & Suh 2018; Cheraghi et al. 2019). Teaching psychomotor skill is an essential component in the process of learning undergraduate nursing students. It is a skill that is performed quickly, accurately, and skillfully. Nursing students are expected to be fully competent in the skills they are being taught (Haraldseid et al., 2016).

A recently identified coronavirus is the source of the contagious disease COVID-19. discovered in December 2019. As of January 2022, there were 209,204,874 million confirmed instances of COVID-19 worldwide, with 4,391,457 deaths. In Saudi Arabia, on the other hand, there were 547,402 confirmed cases and 8,922 fatalities. (Health Ministry Reports 15 New Coronavirus Cases in 2020). Social isolation was reported by health authorities to be the best applicable method to overcome the epidemic attack of COVID-19 (Murphy, 2020).

Including the educational system, the COVID19 epidemic severely impacted every element of human life.It gen erated turmoil and forced educational institutions to stop operating normally. Many students all over the world

exceeding one billion and half have been impacted by the closing of schools and institutions (Dawadi et al., 2020).

All educational institutions in King Saudi Arabia were forced to close due to the pandemic for over nine mont hs, and all colleges began utilizing virtual learning techniques to make up for the lost educational opportunities..

One form of electronic learning that has begun to be used in nursing education is mobile phones (Alsayed et al., 2019). According to Crompton (2013), mobile learning is described as learning that takes place using a variety of locations, social interactions, and content. There are numerous ways to characterize mobile technology. Any portable device with computing capabilities is a typical description, and some of the most well-known gadgets currently available on the market include, tablets, smartphones, electronic netbooks in addition to e-readers (Zayim & Ozel, 2015). Studies examining the use of learning applications through mobile in the field of education of nursing have shown that these tools improve students' knowledge and skills (Oermann et al., 2016; Jeong, 2017), selfconfidence (Kang & Suh, 2018), competence, and learning motivation and reduce stress (Lee et al., 2016). Also the study of Lin and Lin in 2016 reported the same results.

Additionally, mobile based learning activities are increasing students' need to connect more and have rapid access to knowledge whenever and wherever they are (Salameh et al.2020). It increased students' participation in class and helped their transition from passive learners to more active students who achieve effective role in their learning activities on a behavioral, intellectual, and emotional level (Gomez et al., 2016).

The process of introducing mobile applications in the education process of students in the nursing field aims to promote safety, quality, in addition to professionalism in the field by assisting educators in creating learning activities that are appropriate for students (Billings et al., 2016).

The literature suggests integrating mobile technologies into education to help students advance in the areas of theory a nd practice in nursing education.
Mobile technologies' portability and ease of access allow for learning activities like reviewing material and practicing application processes to continue outside of the classroom (Kang & Suh 2018).

Before undertaking clinical applications, nursing students must develop themselves by learning new information and honing their abilities so they don't endanger the safety of their patients or themselves.

Additionally, a lack of adequate laboratory environments, insufficient teachers, an excessive number of students in nur sing departments, and time constraints impede students from developing their knowledge and psychomotor skills as q uickly as they would want (O'Connor & Andrews, 2018). Mobile technologies are used to sustain the process of learning called outside
class learning and enhance students' knowledge and skills would significantly benefit nursing education in fields like p sychomotor skills (Kim et al., 2017).

Significance of the Study

Education institutions found themselves abruptly obliged to move to remote learning to maintain
continuity of the process of learning due to the crisis that the entire world is currently experiencing by the spread of the Coronavirus.
To maintain social distance and student and teaching staff safety during the COVID-
19 epidemic, the researcher was encouraged to use mobile phones as an educational tool to teach specific clinical ski lls to nursing students which contributed to rise of number of students who use mobile applications during their learning process. The students are the most prevalent group in society to do so in comparison to older individuals.

Study aim is to evaluate learning thorough mobile applications and its effect on performance and attitudes of students in nursing field during Covid-19 pandemic

Objectives:

1- To identify knowledge levels of students in the selected skills of Medical surgical course.
2- To determine the practice levels of nursing students regarding selected skills of Medical surgical course.
3- To design a mobile educational video on selected three topics and skills from the Medical surgical course.
4- To assess learning through mobile on students ahievements in the nursing field
5- To assess the nursing students' perceptions of mobile learning.

Research hypothesis

1-The practice of the nursing students who learnt through mobile learning applications will be higher than the practice of students on traditional clinical sessions by assistant teaching staff.
2-The knowledge score of the nursing students who learnt through mobile learning applications will be more than students trained with traditional clinical sessions by assistant teaching staff.
3-Nursing students are supposed to have a positive attitude toward learning through mobile applications.

Populations and methods

The study is an a quasi-experimental design that was carried out at the College of Nursing, ABHA, King Khalid University, Kingdom of Saudi Arabia. The college has five departments. These departments are, community nursing care, fundamental of nursing care, pediatric nursing, medical surgical nursing, in addition to the department of maternity and newborn health nursing. The college was created by Council of Higher Education Decision No. 14/42/1427 to allow exceptional education in addition to services applied to the community. The college also provides updated research in the nursing field through efficient use of resources.

Sample

About 70 students in the third year were enrolled in the study. Those students were selected by simple random sampling technique out of a total of 80 students. They participated during the fundamental course in nursing during the academic year 2020/2021. Students were informed about the study. After agreed to be incorporated in the study, the total number was divided randomly divided in order to obtain two groups: 35 student for each group [study group (learned by mobile) and control group (learned by traditional method)].

Data collection tools:

Tool (I): questionnaire used to assess knowledge:

It was divided into two parts:

Part one: This included demographic information about students such as age, marital status, and history of mobi le use in learning nursing skills.

Part two: The researcher created depending on a current literature review. [Cooper and Gosnell (2023); Yoost et al.(2023)] to assess nursing students' knowledge of chosen essential nursi ng skills (drug administration, cauterization, and oxygenation).

It is made up of 30 true or false questions.

It was administered to students in both the control and study groups.

Scoring system

Accurate answers take 1 and 0 for erroneous answers. Unsatisfactory knowledge was less than 60% and satisfactory one was (60%) or more.

Tool (II): Clinical Evaluation Checklist

The researcher designed it based on a current literature review Cooper, and Gosnell (2023); Yoost et al(2023) to assess students practice in both control and study groups regarding selected fundamental nursing skills (drug administration, cauterization, and oxygenation).

A score of 1 or 0 was given evaluating each step regarding either it was "done" or "not". In the college, regarding the point grade system of practice less than (60%) is considered failed. Pass degree ranges from 60 to 65% while Pass+ (65-70%). Good degree are given to those who achieve a score (70-75%) while Good +(75-

80%), Very good (80-85%), Very good +(85-90), and Excellent (90-95%). Finally excellent+ are given to students degree (95-100).

Tool (III): Mobile Learning Attitude Scale

It was the scale created by Demir and Akpinar (2016). This scale was designed to to evaluate attitudes toward using mobile applications during learning process. It consists of 45 items divided into four categories: satisfaction (20 things), impact on learning (11 items), motivation (7 items), and usability (7 items). The five-point Likert-type scale was graded as totally agree given score (5), agree given score (4), partially agree (3) while disagree and totally disagree were given (2 and 1) respectively. The total attitude ratings were separated into two levels. The rating of 60% or less is considered negative attitudes while positive attitudes ranges from 60% up to 100%.

Tools validity and reliability

A jury of experts reviewed the tools. This was done to test for clarity of tools in addition to relevance. Also comprehensiveness was checked. All these parameters were evaluated to determine content validity for all data gathering instruments. Cronbach's alpha was used to determine internal consistency reliability, which measures the consistency of outcomes across items within a test. Knowledge questionnaire sheet, Student's Clinical Evaluation Checklist, and Attitude scale Cronbach's alpha were 0.67, 0.60, and 95, respectively.

Procedure

A conference was held with the third-year nursing students to familiarize them with the objectives of the study and oral consent from those who agreed to participate.was obtained.

The researcher chose three topics and three important clinical skills from fundamental nursing course. These include drug administration, catheterization, and oxygenation. This topics was the same for students in both the research and control groups. The researcher used all of the nursing students in the study group's identities and phone numbers to form a Whatsapp group, which all of the studied students joined. the researcher provided an educational video to the students in the study group via WhatsApp, which featured th ree lectures and demonstrations of the three essential clinical abilities.

The control group of 35 students was divided into two skill laboratories. Teaching staff trained these subgroups in traditional clinical sessions.

The effect of mobile learning was assessed using the first and second tools, a knowledge questionnaire sheet and a student's clinical evaluation checklist, after presenting situations and exercises and comparing the results among students in the study and control groups after watching the video and attending traditional clinical sessions. In addition, the attitude of the study group students toward mobile learning was examined using the attitude scale. The data gathering period lasted three months, from October 2020 to February 2021.

Pilot study:

About 10% of nursing students were included as a pilot sample. Questions were tested to be sure that they are clear and understandable. Also the needed time complete questionnaires were evaluated. There was no need for any modifications which allowed us to include those students in study sample.

Ethical and administrative issues

Permissions were received after presenting the study purpose to the Dean of the Faculty with obtained ethical committee, approval No: ECM#2021-5610 .

Students who participated were given information and detailed description about study nature and purpose. They have the complete freedom to participate or stop participation at any time freely without any problems.

Statistical analysis

Using SPSS version 20, the gathered data were prepared, tabulated, and examined. Descriptive statistics in the form of frequency and distribution were generated for qualitative data.

The chisquare test (X2 value) in analytical statistics was used to compare categorical data between groups. Additionally, the Pearson correlation coefficient test was used. P-values under 0.05 were regarded as statistically

significant (*), whereas P-values above 0.05 were regarded as statistically insignificant (**), and P-values over 0.001 as extremely significant (*)

Results:

Table 1: The knowledge levels of nursing students in both study and control groups (n=70).

Levels of knowledge	**Group**				χ^2	**P-value**
	Study (n=35)		**Control (n=35)**			
	No	**%**	**No**	**%**		
Satisfactory (60% - 100%).	**30**	**85.7**	**12**	**34.3**	**54.750**	**0.000****
Unsatisfactory (<60%)	**5**	**14.3**	**23**	**65.7**	**75.429**	**0.000****

χ^2 Chi square test ****** A highly significant (P less than 0.001)

Table (1) shows statistically significant difference between both groups with (85.7%) of group had mobile based learning achieved satisfactory knowledge, while (65.7%) of students who received traditional methods had an unsatisfactory knowledge level.

Table 2 The percentages of nursing students' practice grades in the studied groups (n=70).

Practice Grades	**Study group (n=35)**		**Control group (n=35)**		χ^2	p-value
	No.	%	No.	%		
Excellent+	12	34.3%	5	14.3%	17.3	<0.001
Excellent	7	20%	2	5.7%		
Very good+	5	14.3%	2	5.7%		
Very good	6	17.1%	3	8.5%		
Good+	3	8.5%	20	57.1%		
Good	2	5.7%	2	5.7%		
Pass+	-	-	1	2.8%		

Table (2) reveals that a statistically significant difference between the studied groups with (54.3%) of study group students who were taught via mobile learning received excellent+ and excellent grades, 34.3% and 20%, respectively, compared to 14.3% and 5.7% of those who were taught using traditional clinical sessions

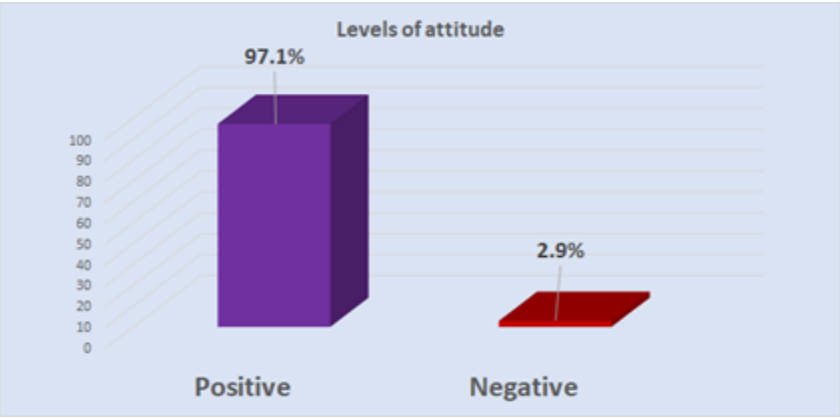

Figure 1: Attitude levels of nursing students in the study group toward mobile learning.

The majority of nursing students (97.1%) had a positive attitude toward mobile learning, whereas a lowest perce ntage of students (2.9%) had a negative attitude.

Table 3: Correlation between knowledge , practice and attitude scores of students of study group (n=35)

Variables	Score of Practice		Score of attitude	
	r	P value	r	P value
Score of attitude	0.850	<0.001**	-	.-
Sore of knowledge	0.850	0.001**<	0.577	<0.001**

Table (3) demonstrates a positive correlation between the score of knowledge and the practice scores. A strong positive correlation was also reported between practice and both knowledge and practical scores.

Discussion

Numerous public health initiatives have been prompted by the coronavirus disease 2019 (COVID-19) outbreak's global spread. E-learning tools are essential in this epidemic (Subedi et al., 2020). Among the most recent technology developments that can be included into the process of nursing learning is mobile technology (Patil et al., 2016).

Students were able to continue their education outside of school and throughout their daily activities thanks to the availability of mobile technologies. Through mobile learning, students were able to hone their clinical skills without endangering the safety of patients. Utilising mobile technology in pre-registration nursing education enhanced student readiness for practise, enhanced students' critical thinking abilities, and led to safer patient care (Gapp, 2015).

The current study's objective is to investigate the learning process through mobile applications on the excellence in education as well as mindsets of nursing students.

The results of the present research demonstrate that, in contrast to a relatively small number of nursing students in the control group, the majority of nursing students in the study group exhibited appropriate levels of clinical knowledge about three essential nursing skills (drug administration, cauterization, and oxygenation).

The reported results illustrated that learning through mobile applications was successful. The improvement is undoubtedly due to the new learning approach; nursing students were driven by new mobile learning content, which allows them to practice specific target information repeatedly without regard for spatial constraints. Meanwhile, students' mobile applications will be in English, so they will not be exposed to superfluous cognitive strain. Furthermore, this strategy makes information available all the time, repeatedly simply accessible, and less expensive than printable text.

The results of earlier research on the efficiency of mobile learning interventions (Gilavand et al., 2016; Kamangar et al., 2016; Joyce and Kellie 2017) are in agreement with this one. They found that using mobile technologies can help students become more clinically literate.

The research of Gomaa et al. (2020), Kim and Suh (2018), and Abdel-Salam (2018) all follow a similar pattern. They showed that, for nursing students, there was a highly statistically significant difference in knowledge ratings

between the study and control groups and that, following the use of mobile learning, the majority of students had a satisfactory knowledge.

The current study's findings show that slightly more than half of nursing students taught with mobile learning re ceived excellent plus and excellent grade of practice on selected three skills of the fundamental nursing course, while those taught with traditional clinical sessions received good plus grade of practice.

According to the researcher, mobile learning allows students to learn anywhere, at any time, without having to be in specific learning environments, and allows them to repeat the same skill they observed. It also supports student-centered education, as all nursing students already own a mobile phone that is connected to the internet.

Additionally, college students continue to use their own devices, preferring small, portable ones, and desire access to course materials and information via their mobile devices, as well as the interactive and user-friendly mobile applications that appealed to them. Additionally, nursing students find that using mobile technology to study clinical skills is more enjoyable, and that increased student excitement positively affects student practise.

The adoption of a mobile learning method enhances nursing students' practical skills, according to research by Foli et al. (2016), Lee & Shin (2016), O'Connor & Andrews (2016), Foster & Sethares (2017), Kim et al. (2017), and Kivisto (2017). These earlier studies found the same thing. Additionally, the results of this study are in line with those of Gallegos et al. (2019), Kim and Park (2019), and Sisson (2020), who found that the use of mobile learning improved students' performance.

The majority of the nursing students in the study group had a favourable attitude towards mobile learning, according to the results of the current study. These findings may be explained by the widespread use of such devices in modern education or by the fact that the incorporation of mobile technologies in nursing education enabled students to actively engage in various learning contexts and reinforce learning at any time or in any location.

This involvement has the ability to improve student attitudes. Such widespread positive responses and attitudes toward mobile learning can be explained by the fact that practically all students now own mobile phones and are connected to the internet.

This conclusion backs up the findings of previous researches by Patil et al, (2016), Iqbal et al, (2017), Abdel-Salam (2018), & Bartholomew &Reeve (2018), and Demir & Akpinar (2018). They discovered that students have a positive attitude toward mobile learning.

The current study found a positive correlation between knowledge and practice scores regarding students used mobile apllications, as well as a positive correlation between attitude score and both knowledge and practical scores. This outcome, however, was expected because when nursing students have a positive attitude toward mobile learning, they acquire a satisfactory knowledge, which leads to an improvement in their practice, and mobile learning assists nursing students in acquiring knowledge and practicing.

The results of Thukral et al. (2014), Bauman (2016), and Lee et al. (2016), who found no statistically significant link between knowledge and practise scores of nursing students after the adoption of mobile learning, are in conflict with those of this study.

Conclusion

The study's conclusions increase the evidence supporting the introduction of mobile strategies in the process of education. The method aids in the improvement of knowledge and skills in nursing students. The findings also indicated that the nursing students showed a favourable view about mobile learning

Recommendation:

1. mobile technology should be integrated into learning process
2. Provide appropriate training programs for both nursing educators and students on the use of mobile applications in education.
3. Educational institutions are urged to strengthen laboratory facilities and faculty capabilities to support t he mobile learning method.
4. Further research are needed with large sample size, and mobile learning should be linked to students' critical thinking skills and academic achievement.

Acknowledgement

The King Khalid University Deanship of Scientific Research, which provided fund for this project through a general research project with the grant number (RGP2/169/44/2023), is thanked by the authors for their support.

References:

1. **Abdel-Salam A . A.(2018):** The Effect Of Using Mobile Device With Quick Response Code On Academic Performance Amongst Pediatric Nursing Students. Menoufia Nursing Journal; 3(1): 59-76.
2. **Alsayed S., Bano N., & Alnajjar, H. (2019):** Evaluating Practice Of Smartphone Use Among University Students In Undergraduate Nursing Education. Health Professions Education J;6(2): 238-246.

   Bartholomew S . R., & Reeve, E. M. (2018): Middle School Student Attitudes And Actual Use Of Mobile Devices: Highlighting Disconnects In Student Planned And Actual Usage Of Mobile Devices In Class. Applied Sciences, Technology And Education Faculty Publications. Available At: Https://Digitalcommons.Usu.Edu/Aste. Accessed:22 / 2 /2021, 8 P.M
3. **Bauman E. B.(2016):**Games, Virtual Environments, Mobile Applications And A Futurist's Crystal Ball. Clin Simul Nurs J; 12(4):109-114. Available At: Https://Doi.Org/10.1016/J.Ecns.
4. Accessed:21 / 4 /2021, 8 P.M.
5. **Billings D. M., Kowalski K., Shatto B., & Erwin, K .(2016):** Moving On From Millennials: Preparing For Generation. Journal Of Continuing Education In Nursing; 47(6): 253-254.
6. Available At: Http://Dx.Doi.Org/. Accessed:17 / 4 /2021, 10 A.M.
7. **Cheraghi R., Jasemi M., & Namadi, F. (2019):** Effectiveness Of The Clinical Teaching Associate Model In Clinical Nursing Education. J Nursing And Midwifery Studies; 8: 132-136.
8. **Crompton H .A .(2013):** Historical Overview Of M-Learning: Toward Learner-Centered Education. In: Berge ZL, Muilenburg L, Editors. Handbook Of Mobile Learning: Routledge. PP. 3–14
9. **COOPER, K; GOSNELL, K.** *Foundations and Adult Health Nursing-E-Book*. Elsevier Health Sciences,USA., 2023., P.P: 342-343, 383, 446-451 .
10. **Dawadi S., Giri R., & Simkhada, P.(2020):** Impact Of COVID-19 On The Education Sector In Nepal-Challenges And Coping Strategies. Sage Submissions. Preprint. Available at:
11. https://doi.org/10.31124/advance.12344336.v1.
12. **Demir K., & Akpinar, E. (2016):** Mobil Öğrenmeye Yönelik Tutum Ölçeği Geliştirme Çalışması. Eğitim Teknolojisi Kuram ve Uygulama, 6(1).
13. **Demir K., & Akpinar, E. (2018):**THE Effect Of Mobile Learning Application On Students' Academic Achievement And Attitudes Toward Mobile Learning. Malaysian Online Journal Of Educational Technology;6(2):48-59.
14. **Foli K. J., Karagory P., & Kirby, K. (2016):** An Exploratory Study Of Undergraduate Nursing Students' Perceptions Of Digital Badges. J Nurs Educ;55(11):640-644. Available At: Https://Doi.Org/. Accessed:17 / 3 /2021, 10 P.M.

Foster M., & Sethares, K. (2017): Current Strategies To Implement Informatics Into The Nursing Curriculum: An Integrative Review. On-Line Journal Of Nursing Informatics; 21(3). Available At: Https://www.researchgate.net

Gallegos C., Gehrke P., & Nakashima, H .(2019): Can Mobile Devices Be Used As An Active .16 Learning Strategy? Student Perceptions Of Mobile Device Use In A Nursing Course. J Nurse Educator; 44(5):270–274.

17. **Gapp D. (2015):** First Generation College Students And Mobile Device Acceptance In Nursing Education. Western Michigan University. Transactions Of The International Conference On Health Information Technology Advancement;3 (1). Available At: Http// Scholar Works.Wmich.Edu/Ichita. Accessed: 16/1/2021, 9 P.M
18. **Gilavand A., Shooriabi M., & Shahzadeh, B.(2016):** The Impact Of Application Of Mobile Educational Software (DMOTMC) On Promoting Students' Awareness Of Dental Treatment Of Patients With Systemic Diseases. J Med Educ Dev; 9(23):31–41.
19. **Gomaa E . M., Ali Z .H., & Abd-Elgalil, H. (2020):**
20. Effect Of Mobile-Based Learning On Second Year Nursing Students' Clinical Competence And Motivation. IOSR Journal Of Nursing And Health Science;9(6): 27-37.
21. **Gomez J E., Huete J.F., & Hernandez, V .L. (2016)**:A Contextualized System For Supporting Active Learning. IEEE Trans Learn Tech; 9(2): 196-202.
22. **Haraldseid C., Friberg F. , & Aase, K. (2016):** How Can Students Contribute? A Qualitative Study Of Active Student Involvement In Development Of Technological Learning Material For Clinical Skills Training. BMC Nurs; 15(1). Available At: Https://www.researchgate.net/publication/
23. **Iqbal S., Khan M . N., & Malik, I . R .(2017):** Mobile Phone Usage And Students' Perception Towards M-Learning: A Case Of Undergraduate Students In Pakistan. International Journal Of E-Learning And Distance Education; 32(1):1-16.
24. **Jeong H. (2017)**: Effects Of Nursing Students' Practices Using Smartphone Videos On Fundamental Nursing Skills, Self-Efficacy, And Learning Satisfaction In South Korea. EURASIA J Math Sci Tech Ed; 13: 2351-2365.
25. **Joyce Z., & Kellie, A. (2017):**Using Quick Response Codes In The Classroom: Quality Outcome. Computers, informatics, nursing: CIN ;35(10). Available at https://www.nursingcenter.com/
26. **Kamangar B. M., Jahanian I., Gholinai H., & Zadeh, H. A. (2016):** Preliminary Study Of The Effect Of Mobile-Based Education On Dental Students' Learning In Practical Course Of Oral Pathology. J Med Educ Dev; 9(22):21–26.
27. **Kang J.,& Suh, E. E. (2018)**: Development And Evaluation Of Chronic Illness Care Smartphone Apps" On Nursing Students' Knowledge, Self-Efficacy, And Learning Experience. Comput Inform Nurs J; 36: 550-559.
28. **Kim S .J., Shin H., Lee J., Kang S., & Bartlett, R .A .(2017):** A Smartphone Application To Educate Undergraduate Nursing Students About Providing Care For Infant Airway Obstruction. Nurse Educ Today; 48: 145-152**.** Available at : Https://Doi.Org/
29. **Kim H., & Suh, E. E. (2018)**: The Effects Of An Interactive Nursing Skills Mobile Application On Nursing Students' Knowledge, Self-Efficacy, And Skills Performance: A Randomized Controlled Trial. Asian Nursing Research J; 12 : 17-25.
30. **Kim J. H., & Park, H .(2019):** Effects Of Smartphone-Based Mobile Learning In Nursing Education: A Systematic Review And Meta-Analysis. Asian Nursing Research J; 13(1): 20 - 29. Available at : Https://Doi.Org/. Accessed April 20, 2021; 6:00pm.
31. **Kivisto M. (2017):** Nursing Students Experiences In Learning With Mobile Technology. Master Thesis. Helsinki Metropolia University of Applied Sciences , Accessed: 22/5/2021, 8 P.M.
32. **Lee N J., Chae S. M., Kim H., Lee J .H., Min H .J., & Park, D. (2016):** Mobile-Based Video Learning Outcomes In Clinical Nursing Skill Education: A Randomized Controlled Trial. Comput Inform Nurs J; 34: 8-16.
33. **Lin Y.T., & Lin, Y. C .(2016):** Effects Of Mental Process Integrated Nursing Training Using Mobile Device On Students' Cognitive Load, Learning Attitudes, Acceptance, And Achievements. Computers In Human Behavior J; 55: 1213-1221.
34. **Ministry of Health Reports 15 New Cases of Coronavirus**. Saudi Press Agency. Retrieved 15 March 2020.

35. **Murphy M. P. (2020):** COVID-19 And Emergency Elearning: Consequences Of The Securitization Of Higher Education For Postpandemic Pedagogy. Contemporary Security Policy J;41(3): 492-505.
36. **O'Connor S., & Andrews, T. (2016):** Co-Designing Mobile Apps To Assist In Clinical Nursing Education: A Study Protocol. Studies Health Technol Inf J; 225:963-964. Available At: Https://Doi.Org/.
37. **O'Connor S., & Andrews, T. (2018):** Smartphones And Mobile Applications (Apps) In Clinical Nursing Education: A Student Perspective. Nurse Educ Today J; 69: 172-178.
38. **Oermann M.H., Muckler V. C., & Morgan, B. (2016):** Framework For Teaching Psychomotor And Procedural Skills In Nursing. J Contin Educ Nurs ;47: 278-282.
39. **Patil R .N., Almale B. D., Patil M., Gujrathi A.,Dhakne-Palwe S., Patil A. R., & Gosavi, S. (2016):** Attitudes And Perceptions Of Medical Undergraduates Towards Mobile Learning (M-Learning). Journal Of Clinical And Diagnostic Research; 10(10): 6-10.
40. **Salameh B., Ewais A., & Salameh, O. (2020):** Integrating M-Learning In Teaching ECG Reading And Arrhythmia Management For Undergraduate Nursing Students. International Journal of Interactive Mobile Technologies; 14(1):82. Available At: Https://Doi.Org/. Accessed February 11, 2021; 5:00pm.
41. **Sisson J . (2020):**Mobile Technology In Undergraduate Nursing Education: An Evidence-Synthesizing Project . Master Thesis, Faculty Of Nursing, Messiah University.
42. **Subedi S., Nayaju S., Subedi S., Shah S .K., & Shah, J. M. (2020**): Impact Of E-Learning During COVID-19 Pandemic Among Nursing Students And Teachers Of Nepal. International Journal Of Science And Healthcare Research; 5(3): 68-76**.**
43. **Thukral A., Joshi M., Joshi P., Prakash V., Adkoli B. V., & Deorari, A.K. (2014):** Apps For Management Of Sick Newborn: Evaluation Of Impact On Health Care Professionals. J Trop Pediatr;60(5):370-376.
44. Available At: Https://Doi.Org/10.1093/Tropej/Fmu032
45. **YOOST, B. L.; CRAWFORD, L. R.; CASTALDI, P.A.** *Study Guide for Fundamentals of Nursing E-Book*. Elsevier Health Sciences, USA., 2023., P.P. 133-140, 154-156, 172-175.
46. **Zayim N., & Ozel, D. (2015):** Factors Affecting Nursing Students' Readiness And Perceptions Toward The Use Of Mobile Technologies For Learning. CIN: Computers, Informatics, Nursing J; 33(10): 456–464.