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Nursing Students' Perception Regarding Mobile-Based Learning

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Abstract: **Mobile technology is one of the latest extensions of technological innovations that can be integrated into nursing education. With the aid of these devices, students learn faster outside the classroom by having quick access to the internet and easy retrieval of required health related learning resources to keep alongside of recent trend and development. Aim: This study aimed to assess nursing students' perception regarding mobile based learning. Design: A descriptive exploratory research design was used. Subjects: A Purposive sample of all adult second year nursing students (n=90) affiliated at Faculty of Nursing, Helwan University. Setting: This study was conducted at second year class at the Faculty of Nursing, Helwan University. Tools: two tools were used for data collection, (I) Self-administered Questionnaire: it included: Student's demographic character (II) Students' perception regarding mobile based learning Results: more than half of studied subjects were 20 years and more with mean age 19.74 ± 0.81. Also, 57.8% were female. As well the current study results clarify that less than one-fifth of the studied nursing students had high perception of mobile based learning. Conclusion: It can be concluded that, mobile device is a valuable form of technology that can be used in nursing education to promote nursing student' in learning a clinical nursing skills Recommendation: The study recommended integration of Mobile based learning into to the undergraduate nursing curriculum as a complementary strategy for learning.**

Keywords: **Mobile learning, Nursing students, Perception.**

1. INTRODUCTION

For most university students, the Internet has become an indispensable part of their lives; according to 2018 statistics, adults aged 18 and above generally spend 45 min per day on social media **(Nielsen, 2018)**. Although mainly used for leisure, the Internet and social media may also be used for learning. The ubiquity of mobile and web technologies allows learners to learn the right thing at the right time according to their needs creating seamless learning spaces that enable continued learning experiences across different scenarios or contexts **(Kukulska-Hulme & Viberg, 2018).**

Mobile learning is an essential educational technology component in higher education. It makes it possible for students to learn, collaborate, and share ideas, so there is a greater need for educational institutions to strengthen the practices in the curriculum and the use of innovative teaching techniques and approaches will be a paramount importance **(Toquero, 2020).** Several researches on mobile learning has been conducted in order to understand the use of mobile devices in educational settings as mobile learning generally, helps students to develop technological skills, conversational skills, find answers to their questions, develop a sense of collaboration, allow knowledge sharing, and hence leverage their learning outcomes **(Sönmez et al., 2018).**

In the nursing training context, common strategies of teaching and learning that are commonly present: lecture and dialogical classes, skills practicing, the development of simulated clinical scenarios and mobile learning. From this perspective there is the need for a closer look at the identification of satisfaction with teaching-learning and the

development in the self-confidence of the students who experiences these strategies throughout their training. That is, because the learner's satisfaction and self-confidence are variables that allow us to identify and evaluate the effectiveness of the teaching and learning strategies used during the training **(Costa et al, 2020)**.

Use of mobile devices for educational purposes among nursing students today is widespread trend. Evidences showed that integrating mobile devices can improve the quality of nursing education by engaging students in learning experience. Integration of Mobile learning (M-learning) in educational settings is an important issue for academic institutions and universities **(Forehand, Miller& Carter, 2017)**.

Global nursing education programs are experiencing the rapid changes according to recent technologies. In particular, the students are witnessing the exponential growth and power of mobile processing. Using mobile devices has become more commonplace, increasing the desire of students to become more connected, and have instant access to knowledge anytime and anywhere. At the same time, there has been a rapid growth in the mobile technology including both the hardware and software. Furthermore, smartphones and tablets are considered more attractive for students. This is due to the fact that smartphones and tablets are portable and cheaper if they are compared with desktop PCs, and laptops **(Salameh, Ewais & Salameh, 2020)**.

The main theme perceptions of mobile learning included two main categories: benefits of mobile learning and obstacles of mobile learning **(Kihnula, 2017).** Benefits of mobile learning include portability, positive impact on knowledge, improved performance, increased interaction, reinforced learning and positive experiences. Portability gave students the freedom to choose where they wanted to study **(Yoo & Lee 2015).** Podcasts were listened to while attaining to everyday duties such as exercising or driving a car. Students could return to taught subjects after the organized activities on their own time, while mobile technology was used in classrooms it was used also in clinical environments and in simulations settings **(Beauregard et al, 2017).**

Obstacles of mobile technology in nursing education include technical problem, increased requirements, negative experiences and declining effects of long term use .Nursing students reported inadequate functions of mobile devices, connectivity problems and limitations concerning the physical aspects of mobile device as well small screens combined with troublesome scrolling added extra challenge to users and also students owned mobile phones, but not all of them supported the format used by the application **(Waugh & Donaldson 2016)** creating a challenge to execute mobile teaching without providing necessary devices. Additionally, technical problems contributed negatively in the experience of using mobile technology as part of learning. Lack of teaching how to use the devices and applications were considered as barrier and some students admitted that their poor technological skills and understanding hindered them from using mobile technology **(Johansson et al., 2013).**

Significance of the study:

Mobile devices are a regular part of daily life among the younger generations, the number of smartphone users in Egypt is estimated to 23.6 million in 2017, and could reach almost 28 million by 2019. Thus, now is the time to apply mobile device use to nursing education. The young generation who has grown up with mobile devices may become more motivated to learn when mobile devices are incorporated in education.

Use of mobile devices in education highlights the transition from educator-centered teaching to learner-centered education. Furthermore, the use of mobile-based learning in nursing skill education has not been thoroughly investigated in Egypt

Aim of the study:

This study aimed to assess nursing students' perception regarding mobile based learning .through the following objectives:-

1. Assess level of second year nursing students 'perception regarding benefits about mobile based learning .
2. Assess level of second year nursing students 'perception regarding obstacles about mobile based learning

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Research question

1. What is the level of second year nursing students 'perception regarding benefits of mobile based learning?
2. What is the level of second year nursing students 'perception regarding obstacles of mobile based learning?

2. METHODOLOGY

Research design:

A descriptive exploratory design was used.

Setting:

This study was conducted at second year class at the Faculty of Nursing, Helwan University at the first term year 2019/2020.

Subjects:

A Purposive sample of all adult second year nursing students affiliated at Faculty of Nursing, Helwan University, was included in the study. The total number of students was 90 students.

Tools for data collection: Data were collected using the following tools

Tool I: Self-administered Questionnaire: it include

Student's demographic characteristics: This tool contained items regarding student's personal data such as (age, sex**,** economic status, final evaluation at first year as regard to nursing subject**,** type of mobile device used, number of mobile phones owned and monthly mobile expenditure).

Tool II: Students' Perception of Mobile Based Learning Sheet:

It was adapted from **(Kihnula, 2017)** to assess students' perception about mobile based learning and was included two main categories:

1st part: Students' perception regarding benefits of mobile learning:

It was developed by the investigator based on literature review and include the following aspects; Portability, Reinforced learning, positive impact on knowledge, Improved performance, Increased interaction and Positive experiences**.**

2nd part: Students' perception regarding obstacles of mobile learning: It was developed by the investigator based on literature review and include the following aspects; Technical problems, Increased requirements, Effects of long term use and Negative experiences).This instrument is self-reported as the students was respond by agree and disagree.

Operational Design

The operational design of this study included preparatory phase, content validity, pilot study, and field work.

Preparatory Phase

It included reviews of current and post local and international related literatures, and theoretical knowledge of various aspects of the study using books, articles, and internet periodicals and magazines in order to develop the data collection tools.

Content Validity

It was ascertained by a Jury consisting of five experts of professors and lecturers from the medical surgical department; Faculty of nursing Helwan University who revised the tools for clarity, relevance, comprehensiveness, understanding and ease for implementation, according to their opinion modifications were applied.

Pilot study

Pilot study had been undertaken before starting the data collection phase. It was carried out on 10% of participants to test the feasibility and applicability of the tools and to estimate the time needed to complete the tools according to the pilot study necessary modifications were done. The subjects included in the pilot study were excluded from the study sample.

Field work description:

Assessment phase:

- A meeting was done to all second year nursing' students that were included in the study to acknowledge them with the objectives of the study and the researcher obtained a written consent from whom accepted to participate.
- During this phase students' assessment was done through interview with them at the second year class to assess their sociodemographic data and Student's perception about mobile learning.

Implementation phase:

- Data collection was started and completed within academic year 2019- 2020.
- The researcher discussed with students all the concerns and questions about this study through whattsapp group.

Administrative Design:

To carry out the study, the necessary approvals were obtained from the dean of faculty of nursing Helwan University to conduct the study.

Ethical considerations:

The ethical research considerations in this study include the following:

1. The research approval was obtained from the ethical committee before starting the study
2. The researcher explained the aim of the study to students who agreed to participate in the study.

3. A written consent was obtained from students who agreed to participate in the study.

4. The researcher assured maintaining anonymity and confidentiality of the subjects' data .

5. Students were informed that they have the right to withdraw from the study at any time.

6. The procedure was not included in the content outlines of 2nd year nursing students' curriculum and it was not included in the evaluation of the students in the first term, and they continued the procedure in the second term.

Statistical analysis:

Data were analyzed using Statistical Program for Social Science (SPSS) version 25.0. Qualitative data (nominal and ordinal) were expressed as frequency and percentage. Quantitative data were expressed as mean and standard deviations

Sample size = 90 students

3. RESULTS

- Table 1 shows that more than half of studied subjects 60% were 20 years and more with mean age 19.74 ± 0.81. Also, 57.8% were female. Majority of the studied students 92.2% had moderate economic status. Besides, more than half 55.6% had very good in the final evaluation at first year as regards to nursing subject. Nearly all students 97.8 used smartphones and more than three-quarters 78.9% had one phone. As regards to monthly mobile expenditure more than half of the studied subjects 58.9% spent from 51 to ≤ 100 pound for mobile used with mean score of monthly expenditure 74.41 ± 32.59.
- Table 2 present that the mean score of student's perception regarding benefits of mobile learning was **0.51 ± 0.32.**
- Table 3 illustrate that the mean score of student's perception regarding obstacles of mobile learning was **0.52 ± 0.35**
- Table 4 describes that there was not statistically significance between demographic characteristics of the studied nursing student and their perception of mobile based learning at pre implementation of the program

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Table (1): Percentage Distribution of the Studied Subjects as Regards to their Demographic Characteristics (n= 90)

Items	N	%
Age		
Less than 20	36	40.0
20 and more	54	60.0
Mean ± SD	**19.74 ± 0.81**	
Gender		
Male	38	42.2
Female	52	57.8
Economic status		
Low	4	4.4
Moderate	83	92.2
High	3	3.3
Final evaluation at first year as regards to nursing subject		
Passable	2	2.2
Good	18	20.0
Very Good	50	55.6
Excellent	20	22.2
***Types of mobile device used**		
Smartphones	88	97.8
Netbooks	2	2.2
Laptops	16	17.8
Tablets	13	14.4
Number of mobile phones		
One	71	78.9
Two	19	21.1
Monthly mobile expenditure/pound		
≤ 50	23	25.6
51 to ≤ 100	53	58.9
101 to 150	14	15.6
Mean ± SD	**74.41 ± 32.59**	

Table (2) Percentage Distribution of the Studied Subjects' Perception about benefits of mobile based learning (n=90)

Items	Benefits			
	Disagree		Agree	
	N	%	N	%
Anytime	26	28.9	64	71.1
Anywhere	24	26.7	66	73.3
Autonomy	33	36.7	57	63.3
Independency	33	36.7	57	63.3
Apply knowledge in real-life situations	33	36.7	57	63.3
Improve retention of knowledge	34	37.8	56	62.2
Increase the confidence in knowledge	36	40	54	60
Enhance critical thinking	43	47.8	47	52.2
Prepare for practice	51	56.7	39	43.3
Monitors performance	52	57.8	38	42.2
Improve efficiency	51	56.7	39	43.3
Support student-teacher communication	47	52.2	43	47.8
Support interaction among students	49	54.4	41	45.6
Helps in coordinating with faculty and preceptors	55	61.1	35	38.9
Triggers discussion	55	61.1	35	38.9
Triggers reflections	55	61.1	35	38.9
Increase self- study	48	53.3	42	46.7
Increase the use of evidence based practice	49	54.4	41	45.6

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Learning continues after activities	50	55.6	40	44.4
Helps in find answers in real time	52	57.8	38	42.2
Supports learning process and outcomes	52	57.8	38	42.2
Effects learning attitudes positively	41	45.6	49	54.4
Increase participation to learning activities	39	43.3	51	56.7
Decrease cognitive load	39	43.3	51	56.7
Considered as helpful tool for learning	46	51.1	44	48.9
Increase students' satisfaction	46	51.1	44	48.9
Useful in answering clinical questions	48	53.3	42	46.7
Positive feedback from mentors and patients	45	50	45	50
More time to spend with the patients	46	51.1	44	48.9
Increase the feeling of confidence	45	50	45	50

Table (3) Percentage Distribution of the Studied Subjects Perception about Obstacles of Mobile based Learning (n=90)

Items	**Obstacles**			
	Disagree		**Agree**	
	N	**%**	**N**	**%**
Restrictions of mobile technology	26	28.9	64	71.1
Lack of technological knowledge	25	27.8	65	72.2
Requires extra training	37	41.1	53	58.9
Increase cognitive load	37	41.1	53	58.9
Increase costs	37	41.1	53	58.9
Reduce benefits over the time	58	64.4	32	35.6
Decrease reliance on the mentors	58	64.4	32	35.6
Negative stigma towards mobile technology	48	53.3	42	46.7
Increase fear to face real patients	49	54.4	41	45.6
Mobile learning lacks face-to- face teaching	50	55.6	40	44.4

Table (4) Relation between nursing students' perception of mobile based learning and their demographic characteristics.

Items	**(Perception)**				**x^2 P**
	Low		**High**		
	N	**%**	**N**	**%**	
Less than 20	27	37	9	52.9	$x^2 = 1.46$ P = 0.22
20 and more	46	63	8	47.1	
Male	30	41.1	8	7.1	$x^2 = 0.2$ P = 0.65
Female	43	58.9	9	52.9	
Low	2	2.7	2	11.8	$x^2 = 3.26$ P = 0.19
Moderate	68	93.2	15	88.2	
High	3	4.1	0	0.0	
Passable	2	2.7	0	0.0	$x^2 = 1.68$ P = 0.64
Good	13	17.8	5	29.4	
Very Good	42	57.5	8	47.1	
Excellent	16	21.9	4	23.5	
One	59	80.8	12	70.6	$x^2 = 0.86$ P = 0.35
Two	14	19.2	5	29.4	
≤ 50	16	21.9	7	41.2	$x^2 = 3.17$ P = 0.2
51 to ≤ 100	46	63	7	41.2	
101 to 150	11	15.1	3	17.6	

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4. DISCUSSION

Presence of mobile technology allowed students to continue learning outside of classroom settings and during their everyday duties. Technological interventions permitted students to practice their clinical skills without compromising patient safety. Adding mobile technology in pre-registration nursing education improved nursing performance, prepared students for the practice and enhanced critical thinking skills leading to saver patient care. The presence of mobile technology increased the students' confidence and improved efficiency and organizational skills during clinical practice.

Concerning students' demographic characteristics and as regards studied nursing students' age and gender, the present study showed that, more than half of studied subjects were females aged twenty years and more with mean age 19.74 ± 0.81and majority of the studied students had moderate economic status. This may be because the students of this study were in the same study year (2nd year) and the old belief that nursing is profession to female so most of nurses in Egypt are females and from families with moderate economic status. This finding was supported by **Costa et al., (2020)** in the study entitled "Satisfaction and self-confidence in the learning of nursing students: Randomized clinical trial, who reported that most students were female and the most frequent age group was from twenty one to twenty three years old .

In the same line the result of the current study confirm with **Salameh, Ewais. & Salameh. (2020)** who accomplished the study about Integrating M-Learning in Teaching ECG Reading and Arrhythmia Management for Undergraduate Nursing Students, and stated that the majority of the participants in both control group and experimental group were between twenty two to twenty four years of age. Concerning the participants' gender, 65.4%, 57.7% of the participants were female in both control group and experimental group respectively

Concerning type of mobile phone used, the present study showed that nearly all students used smartphones and more than three-quarters had one phone. This may be due to the fact that smartphones and tablets are portable and cheaper if they are compared with desktop PCs, and laptops, this makes smartphones available and affordable for a wide range of students. Nowadays, most of the students are using smartphones on regular bases. These findings were in accordance with **Salameh et al., (2020)** who reported that 100% of the students owned Smartphone's and they use it on a regular basis. This data is higher than previous studies which found that majority of the students owned mobile devices **Briz-Ponce et al., (2017)** who studied Learning with mobile technologies–Students' behavior.

On the same line **Boruff & Storie (2014)** in the study about Mobile devices in medicine: a survey of how medical students, residents, and faculty use smartphones and other mobile devices to find information, mentioned that most of the studied sample owned smart phone device Regarding student's evaluation of nursing subject at first year, the present study showed that more than half of the studied nursing students had very good in the final evaluation at first year as regards to nursing subject. This study results consistent with **Nagah, (2017)** who mentioned in the study entitled **"**High fidelity simulation versus traditional teaching for second year nursing students" that a higher percentage of the traditional group had very good evaluation at nursing subject at first year.

As regards to monthly mobile expenditure, the present study mentioned that more than half of the studied subjects spent from fifty to one hundred pound for mobile used with mean score of monthly expenditure 74.41 ± 32.59. This may be due to that this charging amount is the most suitable money for using phone in internet use. This finding goes in the parallel line with **Iqbal & Bhatti (2016)** who discussed "What drives m-learning? An empirical investigation of university student perceptions in Pakistan, The results of this study suggest that more than 51% of the students' monthly mobile bill exceeds Rs. 500. It means students generally have a monthly mobile budget suitable for subscribing to Internet/SMS packages and thus are in a position to engage in m-learning.

The current study results clarify that less than one-fifth of the studied nursing students had high perception of mobile based learning ,The previous results was in accordance with **Beauregard, P, Arnert, A, & Ponzoni, P. (2017)** who indicated in the study of "Nursing students' perceptions of using smartphones in the community practicum" that, whereas mobile interventions promote students' self-determination in learning, technology does not take away the need for mentors and educators in the learning process. The presence of mobile technology may lead to less dependency upon mentors in clinical environments, students named lack of contact lessons as a disadvantage of mobile learning. These findings support the idea that mobile technology promotes autonomy of the learner as they can decide what kind of information they need and when. In this respect **Kelly et al., (2016)** indicated, that mobile technology affected learning

outcomes positively. The transferability in time and space provides more time and possibilities for student to learn, thus explaining the increase in knowledge and improvement in the outcomes of learning. Continuing access to learning materials increased self-learning, accordingly it reinforced learning and improved the retention of knowledge. Incorporation of mobile technology into simulations provided effective practice environments where students could take on the role as a nurse and practice some essential clinical skill, as also demonstrated in other previous studies.

Moreover, the study also accorded with **Jan et al. (2016)** who published a study entitled "Enhanced and effective learning through mobile learning an insight into student's perception of mobile learning at university level" and founded that the students showed strong support for m- learning implementation because technology have many advantages such as mobility, accessibility and flexibility This is addressed by the study done by **Rojas-Osorio & Risco, (2019)** who studied "Intention to Use Smartphones among Peruvian University Students " that they were majority of the students perceived M-learning as flexible method of learning as it can be done anytime, anywhere. However, based on the study results the investigators encouraged towards the adoption of m-learning evidenced that 75% of the students are willing in the future to use it in their learning. Students expect that mobile learning will improve their learning and experiences as our students perceived that M-learning will bring new opportunities of learning process.

Moreover, in terms of learner-teacher interaction, **As Jan et al. (2016)** asserted in her study where students agreed that M-learning will improve their learning experiences and communication with their colleagues and teachers and clarified that the conventional communication practices, such as face-to-face interaction and e-mails, were more often employed; mobile texting was a supplementary method when conventional practice failed. Learner-learner interaction and the formation of learning communities are facilitated by mobile applications, e.g. WhatsApp .Instant messaging has been perceived by students as a personalized and timely way to receive information. Also, **Rambe and Bere (2013)** "Using mobile instant messaging to leverage learner participation and transform pedagogy at a South African University of Technology" found that the students preferred mobile instant messaging to traditional classroom interaction because of its anonymity, flexibility, and affordances for personal reflection

5. CONCLUSION

- **Based on the findings of the present study, it can be concluded that**: that more than half of studied subjects were 20 years and more with mean age 19.74 ± 0.81. Also, 57.8% were female. As well the current study results clarify that less than one-fifth of the studied nursing students had high perception of mobile based learning.

6. RECOMMENDATIONS

Based upon results of the current study, the following recommendations are suggested:

1. Introduce adequate training programs to both instructors and students on using mobile application in education.
2. Provision of E-courses and blended courses wherever possible in nursing education.
3. Mobile based learning be added to the undergraduate nursing curriculum as a complementary strategy to the existing ones, especially in teaching topics related to Primary Health Care, in which simulation studies and experiments are still incipient.
4. Institutions are encouraged to promote improvements in the laboratory infrastructure and in the faculty capacity to work with the mobile learning strategy.

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