The Role of Mobile Learning in Medical Educational Improvement

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Abstract:

Background: Mobile learning is a new type of learning method which has a some similarities with the electronic learning used for easily obtaining the necessary information at any time need and creating a modern flexible environment for learner in their different setting.

The study aim: The study aim was to assess the knowledge and attitude of 6th year medical students regarding the role of mobile learning in medical education.

Subjects and Methods: A cross- sectional study was done on 75 medical sixth class/ Tikrit University student were selected randomly from the period of 1st January/ 2013 till the end of April /2013. A six parts questionnaires form has been prepared by the investigators and distributed to the study sample after receiving their agreements in participating in the study after complete explanation the study purpose.

Results: The study show that most of study sample were female (40-53.3%), and from urban area (57- 76.0%) and majority of them agree that m- learning is very important in medical education (32-57.1%). Most of students go with that m-learning enhancing communication abilities and obtaining a large amount of information with the easily gaining the necessary scientific knowledge.

Conclusion: The study concluded that m- learning provides many services like logging of medical books with lecture notes and practical reports.

Keywords: Medical students, Knowledge, Learning, Students, Assessment.

Introduction:

Medical students want to participate their clinical information background throughout the 6th year study by the evidence base-learning and more professional skills development for better up-dated knowledge [1]. These learning knowledge and skills in medicine need more encouragement and enhancement of problem- solving which are relevant to their clinical situation [2].

Nowadays there has been a success in electronic and mobile resources in medical education learning methods and teaching strategies with the availability of these advanced methods [3, 4]. There were a recent reports and studies about the application of mobile and smart phones by the young age groups in medical education with the help of internet network [5, 6].

Many clinicians used hand held computer during their practice for health care delivery to meet the requirement of recent advanced knowledge and informative resources especially in medical conferences [7, 8]. Mobile learning is quietly beneficial for both of teachers and students according to the line of medical educational practice and the requirements of General Medical Council (GMC) [9].

M-learning is quietly different from electronic learning because of its based on modern technology back ground

which is wireless net work that allows the students to easily obtaining any learning information at any time and any place even inside the class room or outside it. For this purpose, this type of learning method creates a modern flexible environment for learner in their different setting [10]. Therefore the assessment of students opinions in applying such a new method technology is regarded as one of the most useful indicator in attaining a successful establishment of mobile–learning in postgraduate medical education and more ever these electronic devices can be said as an additional way to enhance teachers explanation and solving the expected problems and obstacles that may occur when applying this new pedagogical method at university level [11].

Many studies and researches was conducted to assessing the practical application of m- learning in medical education with the advanced computer technology but there is a missing to update this new method in teaching process. For this reason it needs a much more resources to be exposed on enhancing the provision of m-learning and overcome the expected encountered difficulties that may happen during the application of it and the suitability of such a method in medical schools [12].

The aim of the study:

The study aimed to assess the knowledge and attitude of 6th year medical students regarding the role of mobile learning in medical education improvement.

Subjects and Methods:

1- A administrative agreements: The official permission was taken from Tikrit Medical College before establishing the study.

***2- Study Design*:** A cross- sectional study was done on 6th medical students in Tikrit Medical College because they are the only free clinical stage that can participate in the study without any restricted lectures.

3- Study setting and period: The study was done from the period of 1st January/ 2012 till the end of April/ 2012 in Tikrit Medical Collage.

4- Study Sample and sampling techniques: Simple randomly selected sample from 75 medical students from six classes were included in the study and a verbal consent was taken from each one before starting the study.

5- Study subjects: (75) medical students from six year class were included in the study after complete explanation of the study objectives.

6-Data collection tool: A research-prepared questionnaire form was designed according to the study purpose which contain six parts:-

A- Socio-demographic characteristics including (age, sex, residence).

B- Students knowledge regarding the value of mobile-learning in medical education.

C- Students attitude regarding the role of m-learning in medical education.

D- Students suggestions regarding the future improvements in mobile-learning.

E- Students expectation regarding the future problems that may occur in applying m-learning in medical education.

F- Students expectation about the possible activities and services that mobile learning provided to them during their study.

7-Pilot study: The questionnaire form was presented to 4 experts in the community physician and statistical

experience to detect the reliability of it and to detect the time needed to complete the study. The reliability was (70%).

8- Statistical analysis:-

1- Descriptive study including number and percentage for questions with yes and no answer.

2- Chi- squire test to estimate the relation between variables. The level of significant was at P- value <0.05.

3- For attitude measurement 3 score likert scale as: [13].

(yes- uncertain-no) and scored as:

3 for yes answer

2 for uncertain answer

1 for no answer

Cut off point (3+2+1)/ 3= 2.0, so the results calculated by using the following formula:

$$\frac{\text{No. of yes answers} \times 3 + \text{No. of uncertain answers} \times 2 + \text{No. of no answers} \times 1}{\text{Total Sample}}$$

Results:

Table (1) show that (40-53.3%) of students were female, aged 23-24 years (65- 86.7%) and from urban area (57-76.0%).

Table (2) show that more than half of students agree that m-learning is very important in medical education (32-57.1%) with a p- value= 0.002.

Table (3) presents that more than half of study students go with that m-learning enhancing communication abilities, obtaining a large amount of information and easily gaining the necessary scientific knowledge above cut off point (2.1, 2.4, 2.4) respectively while it is below cut off point in conserving man power resources and time consuming (1.9, 1.7).

Table (4) revels that (41.4%) of study students go with the need for more technical resources for m-learning improvement in medical education.

Table (5) show that (60.0%) of study female students go with the lack of institutional and college support is main future problem while (45.7%) of male students go with the present current policies and instructions with a P value= 0.006.

Table (6) presents that both of male and female students go with mobile learning provides logging books and practical reports and lecture notes (42.9%, 47.5%) respectively with a P value = 0.687.

Table (1): Socio–demographic distribution of study students.

Socio demographic parameter	Number N=75	Percent%
Gender		
Male	35	46.7
Female	40	53.3
Age (years)		
21-22	3	4.0
23- 24	65	86.7
> 24	7	9.3
Residence		
Urban	57	76.0
Rural	18	24.0

Table (2): Students knowledge regarding the value of mobile learning in medical education**.**

Value of mobile- learning in medical education	Students N=75				
	Agree		Disagree		P*Value
	No.	%	No.	%	
1- Important	13	23.2	9	47.4	0.046
2- Very important	32	57.1	3	15.8	0.002
3- Not - important	11	19.7	7	36.8	0.129
Total	56	100.0	19	100.0	

X^2 was used.

Table (3): Medical student's attitude towards the role of m-learning in medical education.

Students Number =75					
Role of m- learning in medical education	Yes	Uncertain	No	Grand total	Mean value assessment
1- Enhancing communication abilities.	32	19	24	2.1	Above cut-off point / S
2- Obtaining a huge amount of update information.	41	27	7	2.4	Above cut-off point / S
3- Easily gaining the necessary scientific knowledge	29	34	12	2.4	Above cut off point /S
4-Conserving man, power resources.	22	28	25	1.9	Below cut-off point / NS
5- Time consuming purposes	24	11	40	1.7	Below cut off point / NS

S: significant (above 2.0)

NS: not significant (below 2.0)

Table (4): Frequency distribution of study students according to their knowledge about the future suggestions of m-learning improvements in medical education.

Future suggestive improvement of m- learning in medical education	Students Number=75	
	No.	%
1- More technical resources are needed	31	41.4
2- Sufficient advanced training program	26	34.6
3- Revisiting new updated curriculum to play an important role for future needs	13	17.4
4- Continuous monitoring and evaluation of information system.	5	6.6
Total	75	100%

Table (5): Frequency distribution of study students according to their knowledge about the expected problems encountered when m- learning applied in medical education.

Expected problems encountered during m-learning application in medical education	Students Number=75					
	M	%	F	%	Total	*P value
1- Resistance of medical staff	9	25.7	5	12.5	14 (18.7%)	0.143
2- The present policies and instructions	16	45.7	11	27.5	27 (36.0%)	0.006
4- Lack of institutional and colleges support	10	28.6	24	60.0	34 (45.3%)	0.101
Total	35	100.0	40	100.0	75 (100.0)	

X^2 was used

Table (6): Student distribution regarding the possible activities that provided by m-learning in medical education.

Possible activities that provided by m- learning	Students Number=75					
	M	%	F	%	Total	*P value
1- Sending / receiving SMSs	7	20.0	3	7.5	10 (13.4%)	0.112
2- Medical dictionary and calculator	2	5.7	1	7.5	3 (4.0%)	0.479
3- Medical guide lines	2	5.7	5	12.5	7 (9.3%)	0.314
4- Research journal and books with medical reference	4	11.4	8	20.0	12 (16.0%)	0.312
5- Book logging and practical reports with lecture note	15	42.9	19	47.5	34 (45.3%)	0.687
6- Examination course	5	14.3	4	10.0	9 (12.0%)	0.569
Total	35		40		75 (100.0%)	

X^2 was used

Discussion:

Concerning the value and benefit of m-learning in medical education, the current study show that majority of medical students agree that m-learning is very important.

Briz-*etal*/ [14] conducted a study in University of Salamanca/ 2016 among 30 students to compare the obtaining results between two learning methods using anatomic application and the

traditional teaching method and they found that the student's performance for mobile learning is quite better and show a statistically significant than students with traditional method. They further explained the importance of m-learning in medical education by discussing that this new technology method of learning is considered as an additional way and complementary to the teachers role in class room and it should be encourage the usage of it and solving any problems that may occur when applied it and this result is go with the current study because mobile learning has the same benefit and role.

Regarding the role of m-learning in medical education, the current study show that most of study students go with that m-learning enhancing communication abilities and obtaining a large amount of information with the easily gaining the necessary scientific knowledge. So this finding go with Ken *etal*/ [15] who prepared a similar study among 129 medical students in their 7th year in Oman/ Sultan Qaboos University/2010 to determine the effect of mobile learning in their study activities. They found that majority of the study students used sophisticated type of mobile device in their study medical application as a telephone and there was a high number of students used it as a guide line and references indicator. They also mentioned in the study that the main problem and obstacle in m-learning application was the (cost, small size screen). They referred to the main useful advantages of m-learning in time consuming purposes and the simplicity of usage due to its small size.

Strayer *etal*/ [16] /2008 preformed a study on the medical students to detect the suitability of Personal Digital Assistants (PDAs) in their medical study and they found that (59%) of them used their PDAs, and (71%) of them download their medical lectures and text books in their PDAs successfully more than other technical devices like computers.

For the possible future suggestion in m-learning application in medical education, the study students go with the need for more technical resources.

A study was performed at Los Angelos/ University of California/ 2010 [17] to assess the suitability of m-learning application in medical education with the possible future suggestions accompanied with the assistance of PDAs for their medical training during practical and clinical study. They documented that 3d year and 4th year medical students should obtain PDAs or any equivalent technical device supporting them in practicing aspect and they related that to the main causes which are:

1- The first primary cause is to maintain the students in continuous contact with updated scientific medical information.

2- The second reason is to enhance the student's ability for proper practicing the medicine in the future time.

They mentioned in this study that the main important future suggestions for m-learning application is the supporting of students in their colleges and it must be mandatory for the 5th and 6th year medical students to using the mobile in the clinical study in order to enable them for careful dealing with the patients and providing them with a sufficient health care during their future medical life.

Regarding the future possible problems that may occur during the application of m-learning in medical education, the present study reveals that the main problems are the current policies and

instructions with the lack of college and institutional support.

Kho *etal*/ [18] 2006 adapted a similar study to determine the effect of hand held computer use in medical education. They found that the main obstacles that may encountered when m-learning applied are technical supporting with a advanced training program for both of teaching staff and medical students.

The same results were obtained from Jotkowitz *etal*/ [19] 2006 about the using of personal digital assistance in their training practice among medical residents. They reported that there is a wide range of supporting systems which are needed for m-learning application and one of these system is the expanded technical mobile resources through the building of a specific centers for network activity and decrease the mobile costs for students and the provision of assistance technical devices like software or other specific materials for the handheld devices.

For the possible future activities which are provided by mobile in learning aspect, the study show that both of male and female students go with the services of logging books, lecture notes and practical reports.

A study was done by Health *etal*/ 2004 [20] among medical school students/ University of Queen land/ Australia to determine the clinical implementation of PDA in their clinical teaching and they found that the study students favored mobile using for calendar purposes and assistant tool and (10%) of the respondents students were not used at all. They further mentioned that the students can managed their rotation schedule and teaching location during clinical practicing more easily through the using of mobile and copies the lectures and books they needed.

Strayer *etal*/ 2008 [16] in their study to assess the feasibility of PDAs in medical practice and their advantages among medical students and they revealed that electrical devices help them in examination courses by reviewing the previous questions and in the same time they used for medical guide lines in their study.

Conclusion:

1-M-learning enhancing communication abilities and obtaining a large amount of information with the easily gaining the necessary scientific knowledge.

2- More technical resources are needed for better future m learning improvement in medical education.

3- Mobile learning provides many services like logging of medical books with lecture notes and practical reports.

4- m-learning conserving man power resources and time consuming.

Recommendation:

1- Further large wide studies can be conducted on expanded population to assess the suitability of m-learning in medical education.

2- Institutional medical training can support the students to handle the new technical devices for facing the next future health problems.

3- More advanced training program for medical teaching staff to encourage the enhancement handling of mobile in their medical practice.

4- Modification of the current curriculum to adapt the recent updated technology support.

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