The Effect of Interactively Virtual Reality Eyeglasses on The of Pediatric Nursing Students Performance

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Abstract: *Virtual reality is one of the foremost concepts being explored in the world of technology today. This technology can be applied in class rooms therefore the nurse educators can improve the process of learning. Virtual reality can add depth, feeling and visual appeal to it. Virtual reality can change and motivate pediatric nursing students towards their performance.* **Aim of the study**: *The aim of the study was to evaluate the effect of interactively virtual reality eyeglasses on the pediatric nursing students performance.* **Design**: *A quasi-experimental research design was used to conduct the study.* **Settings**: *This study was carried out in clinical pediatric laboratory skills for the third year students and teaching hall of Faculty of Nursing / Benha University.* **Sample**: *A purposive samples of ١٧٢pediatric nursing students from the third year/pediatric nursing department regardless their characteristics. The students randomly selected by a systematic random sample and divided into two identical groups (٨٦ student as a study group) and (٨٦ as a control group).* **Tools of data collection**: *Three tools were used; tool (١) A structured interviewing questionnaire to gather data in relation to characteristics of the study subjects, pediatric nursing student's knowledge regarding virtual reality eyeglasses (Previous uses of virtual reality eyeglasses, uses of virtual reality, how many of time.....etc). Tool (٢) Likert scale: attitude scale toward virtual environment, to assess the pediatric nursing student's attitude toward virtual reality.(٣)Observational checklist sheet for pediatric nursing students to assess clinical pediatric nursingskills.* **Results**: *The results showed that, there was a highly statistical significant difference in the studied student's total knowledge, attitude and practice scores in favor of post training.* **Conclusion**: *the study was concluded that, the pediatric nursing students gain a satisfactory knowledge and improve their practice skills and attitude toward the virtual reality eyeglasses are improved.* **Recommendations:** *The study recommended that faculty of nursing should apply the virtual reality lab in education of courses to make all learners with online access to effective teaching and better learning opportunities.*
Key words: *Interactive virtual reality, Academic Performance. Virtual reality eyeglasses*

I. Introduction

Technology can be a powerful tool for transforming learning. It can help affirm and advance relationships between educators and students, reinvent approaches to learning and collaboration, shrink long-standing equity and accessibility gaps, and adapt learning experiences to meet the needs of all learners.Leaders in nursing education should set a vision for creating learning experiences that provide the right tools and supports for all learners to thrive. However, to realize fully the benefits of technology in education system and provide authentic learning experiences, the nurse educators need to use technology effectively in their practice **(King, ٢٠١٧).**

Virtual Reality (VR) is the future and when it comes to training professional and responsible medical professionals, it provides limitless opportunities. Nursing students enjoy an array of benefits stemming from the use of virtual reality technology in the educational process. For a start, the simulations are both realistic and immersive. The students aren't merely observers but active participants in the respective scenario. The students can perform physical exams and administer some of the treatments that nurses are responsible for. This happens in a safe virtual environment for pediatric patients and the students themselves. It focuses on skills and academic areas that students have a particular interest in. The VR technology is becoming more and more accessible **(Virtual Education Systems, ٢٠١٧).**

The visual ٣D characteristic of this technology completely conforms to the teaching objective of the digital animation course. The virtual feature of animation a fantasy art is shown not only in the extraordinary, unique, unstrained, and vigorous story, but also in the unconventional and exaggerated audiovisual style, specifically, reflected in the imaginary scene setting, virtual figure modeling, and transformation of sound elements. The ٣D technology is an intelligent teaching system could be effectively used in teaching nursing

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courses, research and can provide more abundant channels for digital animation production of targeted pediatric nursing course**(Yuanyuan and Yajuan, ٢٠١٦)**.

II. Significance of the study

The world is changing rapidly due to breakthroughs in science and technology. So it is important to keep learning and acquiring new skills to successfully adapt to these changes. Designing effective learning methods should take into account current knowledge on how the human mind works. There is a view that learning can be enhanced if multiple modalities (e.g., visual, auditory) are engaged in the process**.** TheVR technology can attract the attention of the students to especially developed academic material. Virtual reality can make the processes and situations described in academic to become real**(Elentari, ٢٠١٧).**

III. Aim of the study

This study aimed to evaluate the effect of interactively virtual reality eyeglasses (IVRE) on the pediatric nursing students performance in their learning experience, through the following:
١-Assess knowledge of pediatric nursing students regarding virtual reality
eyeglasses ٢-Assess the pediatric nursing students practice in using virtual reality
eyeglasses
٣-Assess the pediatric nursing students'attitude toward using of virtual reality eyeglasses
Research hypothesis
The performance of students in their learning experience will be positively affected upon use of VRE.
Subjects and methods
Research Design
 A quasi experimental design was used in the current study.
Setting
The study was conducted at both clinical pediatric laboratory skills for the third year/pediatric nursing students and the teaching hall of faculty of nursing / Benha University.
Sample
A purposive sample of ١٧٢ pediatric nursing students from the third year, pediatric nursing department regardless their characteristics, the students were randomly selected and divided into two identical groups (٨٦ student as a study group) and (٨٦ as a control group).
Inclusion criteria:
-Students from both genders.
- Age of students ranged between ٢٠<٢٥ years.
Exclusion criteria:
-Students previous take pediatric nursing course by using virtual reality eyeglasses.

Tools of data collection
Tool (١): Astructured interviewing questionnaire:
        It was developed by the researchers in an Arabic language after reviewing the related literatures, it included two parts:
Part I: Characteristics of the study subjects
Personal characteristics of the studied students include the following: age, sex, academic year, gender, residence and previous training in pediatric course with virtual reality eyeglasses.
Part II: Pediatric nursing student's knowledge questionnaire, it was developed by the researcher to assess pediatric nursing student's knowledge regarding virtual reality eye glasses include the following: previous using of virtual reality eyeglasses, uses of virtual reality, how many of times, length of times, definition, types, indications for use virtual reality eyeglasses, importance, positive and negative impact of virtual reality, fields of virtual reality and health hazards from using virtual reality.
Scoring system of the knowledge questionnaire
The studied students answers were compared with a model key answer, where ٢ scores were given for complete correct answer, ١ score was given for incomplete correct answer and ٠ score for wrong answer and unknown answer. According to the students' responses, their total level of knowledge was categorized as either unsatisfactory level (less than ٦٠٪) or satisfactory level (from ٦٠٪ to ١٠٠٪)
Tool (٢): Likert scale: attitude scale toward virtual environment; was adapted from a standardized likert type rating scale by *Witmer and Singer,* ٢٠٠٥. It was used to assess the pediatric nursing student's attitude toward virtual reality.It included ٦items (students interact with the virtual reality environment, immersion and presence in the virtual reality, motivation, anxiety, behavior and interaction with others) each items was divided into ١٤statements.

Scoring system of the attitude
The responses of students' attitudes were classified into Yes (٢), sometimes (١) and No (٠). The total scores of attitudes were divided into two levels as either negative attitudes (< ٦٠٪) or positive attitudes (٦٠ % ≤ ١٠٠٪).
Tool (٣): An observational checklist sheet, it was developed by the researchers in the light of relevant literature review to assess pediatric nursing students in clinical pediatric nursing skills. It included ٣ procedures (CPR, Oxygen therapy, drug administration (IM injection), According to the actual students responses, their total level of practice was categorized as either poor level (less than ٥٠٪),average level (٥٠٪ to less than ٧٥٪) or good level (٧٥٪ to ١٠٠٪).

Tool (٤):Educational training program handout
   It was prepared by the researchers after reviewing the related literature. The program content included two parts: first part knowledge related to virtual reality(VR) as definition, types, indication, positive and negative effect of virtual eyeglass, difficulties facing virtual eyeglass, Criteria for a good virtual reality environment, applications of virtual reality in education. Second part: knowledge related to virtual reality eye glass (VRE) as definition, types, advantage and disadvantage, methods of using virtual reality eye glass. Using some videos for learning of clinical skills, through virtual reality eye glasses pre and post training in mentioned settings. The following ٣ short instructional videos were showed during skill demonstrations:
a) CPR
b) Drug administration (IntramuscularInjection).
c) Oxygen Administration
The program includes three sessions each session takes from ٢٠-٣٠ minutes. At the end of the program implemented, a booklet of the program was given to each student as a reference. A post test was done to evaluate the effect of the program on improving student knowledge and practice upon using of VRE. The teaching methods used were discussions, brainstorming, and lecture.

Tools validity and reliability
        The data collection tools were revised by a panel of three experts in the field of pediatric nursing to test face and content validity. Modification of the study tools were done according to the panel judgment on clarity of sentences, appropriateness of content and sequence of items. The reliability and internal consistency reliability of all items of the tools was assessed by using coefficient alpha. It was ٠.٩٤ for a structured interviewing questionnaire part ٢ to assess pediatric nursing student's knowledge regarding virtual reality, ٠.٨٣ for student's pre and postquestionnaire,٠.٧٥ for tool (٣) to assess attitude of pediatric nursing student's regarding virtual reality.

Data collection procedure:
        Permission from faculty dean of nursing, Benha University was obtained in order to take an approval for conducting the study.
The actual field work was carried out over a period of three months during academic year ٢٠١٧-٢٠١٨(from the ١st October till the end of December ٢٠١٧). The purpose of the study was explained by the researchers to all students (study and control groups) included in the study. Total number of pediatric nursing student in first term was (١٩١), and (١٩) students refused to participate. So the final total of study sample was (١٧٢) who agree to participate in the study, then were ٨٦ as a study group and ٨٦ as control group. The study group divided into (١٧ groups), each group consist of (٥ : ٦ students). The researchers interviewed each student. Initial individually assessment of student's knowledge and practice by using virtual reality eyeglasses on telephone was carried out prior to training sessions using tool ١ and ٣. The training started by teaching the theoretical pediatric course for all students. In study group the theoretical pediatric course consist of definition, indications, equipment and procedure for each procedure and takes about ٣٠ minutes for knowledge. Theoretical part conducted in the ٣rd year pediatric nursing students' department class room and teaching hall take ٢ hours while the implementation of the practical part conducted in the affiliated nursing laboratory as previously mentioned.

        Practical part: started by setting objectives of virtual reality based training, preparation of the content which covered the reason behind the application of the sessions, CPR, drug administration(IM),oxygen therapy. Demonstration and redemonstration were conducted in ٢ sessions for each group in the clinical pediatric nursing laboratory skills, ٢ session per day/ approximately ٢ to ٣ day per week for ٢٠ days, the time of each session about ٤٥ to ٥٠ minutes, the time depending upon understanding and responses of the students. Study group and control group take the same course. Each student takes about ١٥-٢٠ minutes for CPR, drug administration (IM) and oxygen therapy. Each student was allowed to perform the steps of each procedure in the faculty clinical pediatric nursing laboratory skills under the supervision of researchers. The researchers were repeated procedures until the student mastered these skills. The evaluation phase, during this period the researchers observed the students' practice for pediatric clinical skills after using VRE through pre and post examination form and assessed their knowledge and attitude through students' self-administered questionnaire sheet.

Ethical considerations

The researchers explained the aim of the study to the pediatric nursing students(study and control group). All students in each groups follow in the same sequence of study and they were informed that the study is harmless. The researchers secured that all the gathered data are confidential and are used for the research purpose only. The students were informed that they are optionally allowed either to participate or not in the study and they have the right to withdraw at any time. An oral consent was taken from the students.

Pilot study

A pilot study was carried out on ١٠ % of the total sample size (١٧ pediatric nursing students) over a period of two weeks to test the validity and applicability of the study tools and to estimate the time needed to fill the questionnaire. No radical modifications were carried out on the study tools so the study subjects were included in the study sample.

Statistical analysis

The collected data were organized, tabulated and analyzed using electronic computer and statistical package for social sciences (SPSS) version ٢٠. Descriptive statistics were calculated for the data in the form of: Mean and standard deviation for quantitative data, and frequency and distribution for qualitative data. Also in analytical statistics, inter-group comparison of categorical data was performed by using chi square test (X^2 value). Also, Pearson correlation coefficient test was used. P value <٠.٠٥ was considered statistically significant (*) while >٠.٠٥ statistically insignificant and P value <٠.٠٠١ was considered highly significant (**) in all analyses.

IV. Results

The majority (٩٨.٨٪ and ١٠٠٪) of the study and control groups are ranged between ٢٠-٢٢ years old. In relation to student it was found that, gender more than half (٥١.٢٪ and ٥٢.٣٪) of the study and control groups are female. (١٠٠٪ and ٧٩.١٪) of the study and control groups are not used of virtual reality eyeglasses, in relation to previous uses of VR eyeglasses in learning nursing skills, it is found that, all (١٠٠٪) of the study and control groups haven't used VR eyeglasses in learning.

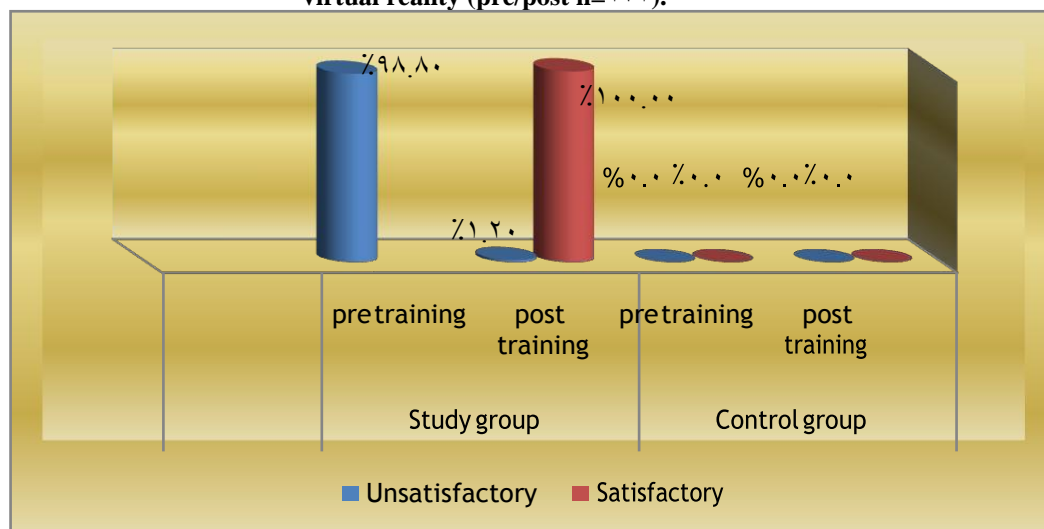**Table (١): Percentage distribution of the studied student's knowledge regarding to virtual reality (pre/post n=١٧٢).**

Items	Study group(n=86)					X^2 test	P	Control group(n=86)		X^2 test	P
	Pre training		Post training					Pre training	Post training		
	Incomplete correct answer	Wrong or unknown	Complete Correct answer	Incomplete correct answer	Wrong or unknown			Wrong or unknown	Wrong or unknown		
	%	%	%	%	%			%	%		
Definition of virtual reality	15.1	84.9	90.7	5.8	3.5	146.02	0.001	100	100	-	-
Types of virtual reality	8.1	91.9	93.0	7.0	0.0	159.07	0.001	100	100	-	-
Indications for uses of virtual reality	12.8	87.2	93.0	4.7	2.3	152.47	0.001	100	100	-	-
Importance of virtual reality	8.1	91.9	84.9	10.5	4.7	141.02	0.001	100	100	-	-
Positive effect of virtual reality	3.5	96.5	89.5	10.5	0.0	163.00	0.001	100	100	-	-
Negative effect of virtual reality	5.8	94.2	96.5	3.5	0.0	164.50	0.001	100	100	-	-
Virtual reality fields	16.3	83.7	96.5	3.5	0.0	162.11	0.001	100	100	-	-
Health problems may be occur from virtual reality	14.0	86.0	95.3	4.7	0.0	160.00	0.001	100	100	-	-
Virtual reality eyeglasses	17.4	82.6	97.7	2.3	0.0	164.94	0.001	100	100	-	-
Types of virtual reality eyeglasses	3.0	93.0	95.3	4.7	0.0	162.40	0.001	100	100	-	-

Table (١): indicates that, the majority (٩١.٩٪) of the study group have wrong or unknown answer regarding definition, types, causes and importance of virtual reality, in the pre-training. While (٩٣٪) of them have complete correct answer regarding definition, types, causes and importance of virtual reality, in post training. While (١٠٠٪) of the control group have wrong or unknown answer regarding definition, types, causes and importance of virtual reality, in the pre and post training. Moreover, there was a highly statistical significant difference (p <٠.٠٠١) in study group at post training.

Indicated also, the majority (٩٦.٥٪, ٩٤.٢٪ and ٩٣٪) of the study group have wrong answer or unknown regarding positive and negative effect, types of virtual reality, in the pre training. Meanwhile (٩٧.٧٪, ٩٦.٥٪ and ٩٣٪) of them have complete correct answer regarding positive and negative effect, types of virtual reality, in the post training. While(١٠٠.٠٪) of the control group haven't any knowledge about positive and negative effect,

types of virtual reality in the pre and post training Moreover, there was a highly statistically significant difference (p <٠.٠٠١) in favor of post training in study group.

Fig. (١): Percentage distribution of the studied students according to their total knowledge regarding virtual reality (pre/post n=١٧٢).
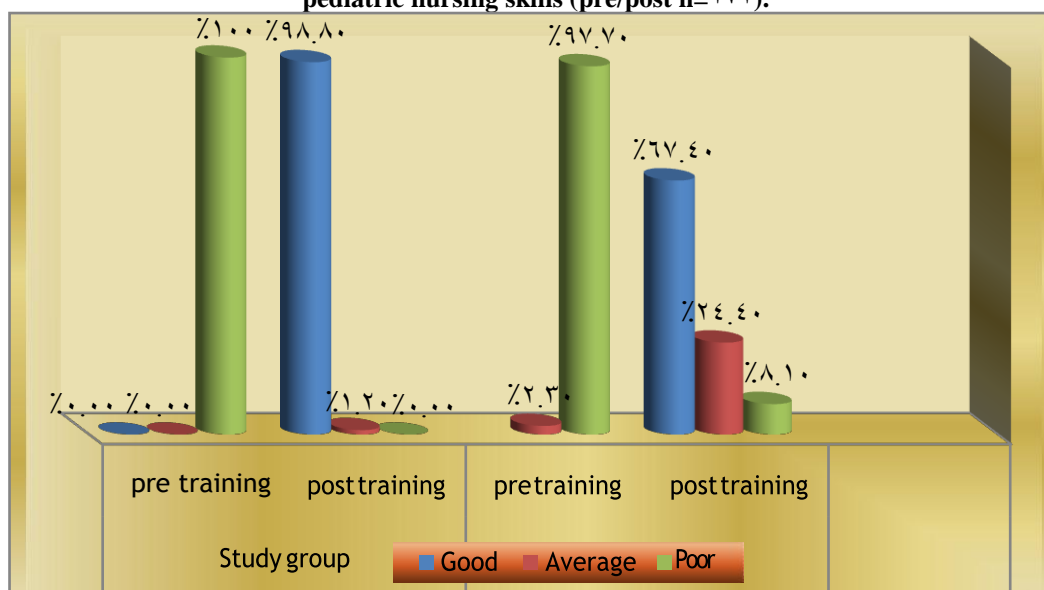

This figure showed that, the majority (٩٨.٨٪) of study group had unsatisfactory knowledge regarding virtual reality in the pre-training. Meanwhile, (١٠٠٪) of study group had satisfactory knowledge in the post training. Moreover, there was a highly statistical significant difference (p <٠.٠٠١) in study group.

Table (٢): Percentage distribution of the studied student's practice toward oxygen, cardiopulmonary resuscitation and drug administration (pre/post n=١٧٢).

Items	Study group(N=86)							Control group(N=86)						
	Pre training		Post training			X^2 test	p	Pre training		Post training			X^2 test	p
	Done incorrectly	Not done	Done correctly	Done incorrectly	Not done			Done incorrectly	Not done	Done correctly	Done incorrectly	Not done		
	%	%	%	%	%			%	%	%	%	%		
Oxygen therapy	7.0	93.0	93.0	5.8	1.2	157.14	.000	2.3	97.7	62.8	29.1	8.1	138.74	0.001
Cardio pulmonary resuscitation	2.3	97.7	94.2	5.8	0.0	166.2	.000	0.0	100	66.3	23.3	10.5	139.41	0.001
Drug administration	9.3	90.7	95.3	4.7	0.0	161.33	.000	23.3	76.7	70.9	29.1	0.0	127.55	0.001

Table (٢): Demonstrates that, more than three quarters (٩٧.٧٪ and ٩٣.٠٪) of the study group not done oxygen, CPR and drug administration in the pre training. While (٩٥.٣٪ and ٩٤.٢٪) of them done correctly in the post training. Also, the same table represents that, the majority (١٠٠.٠٪ and٩٧.٧٪) of the control group not done oxygen, CPR and drug administration in the pre training. While (٧٠.٩٪ and ٦٦.٣٪) of them done correctly in the post training. Moreover, there was a highly statistical significant difference (p <٠.٠٠١) in favor of post training in study group**.**

Fig. (٢): Percentage distribution of the studied students according to their total practice toward clinical pediatric nursing skills (pre/post n=١٧٢).

This figure showed that, the majority (١٠٠٪ and ٩٧.٧٪) of study and control groups had poor practice in the pre-training. Meanwhile, (٩٨.٨٪) of study group had good practice in the post training. Moreover, there was a highly statistical significant difference (p <٠.٠٠١) in favor of post training.

Table (٣): Percentage distribution of the studied student's according to their total attitude toward virtual reality environment (pre/post n=١٧٢).

Items	Total attitude								Paired(t) test	p
	Study group(N٨١)				Control group(N٨١)					
	Pre training		Post training		Pre training		Post training			
	No	%	No	%	No	%	No	%		
Positive	٠	٠.٠	٨٠	٩٣.٠	٠	٠.٠	٠	٠.٠	٦.٦٣١	٠.٠٠١
Negative	٨٦	١٠٠	٦	٧.٠	٠	٠.٠	٠	٠.٠		
Total	٠	٠.٠	٨٦	١٠٠.٠	٠	٠.٠	٠	٠.٠		

Table (٣): Reflects that, the majority (٨٠٪) study group has positive attitudes towards virtual reality environment in the post training in relation to control group.

Table (٤): Total knowledge, attitude and practice scores of the studied students regarding virtual reality inpre/ post the training phases (N=١٧٢).

Items	Study group(No.٨٦)				Control group(No.٨٦)				Paired(t) test	P value
	Pre-training		Post training		Pre-training		Post training			
	No.	%	No.	%	No.	%	No.	%		
Total knowledge score										
-Unsatisfactory	٨٥	٩٨.٨%	٠	٠.٠٪	٠	٠.٠	٠	٠.٠	١٠.٦٢٨	٠.٠٠١
-Satisfactory	١	١.٢٪	٨٦	١٠٠.٠%	٠	٠.٠	٠	٠.٠		
Mean± SD	٣٨.٠٠±٣٤.٨٢				.٠٠±.٠٠٠					
Total practice score										
Good	٠	٠.٠	٨٥	٩٨.٨	٠	٠.٠	٥٨	٦٧.٤	١٥.٥٥٥	٠.٠٠١
Average	٠	٠.٠	١	١.١	١	١.١	١١	١٤.٤		
Poor	٨١	١٠٠	٠	٠.٠	٨٤	٦٧.٧	٧	٨.١		

Mean± SD	٤٣.٦٥±٤ ١.٢٥				٣٦.٤٣±٣ ٥.١٧					
Total attitude score										
- Positive	٠	٠.٠	٨٠	٩٣.٠	٠	٠.٠	٠	٠.٠		
- Negative	٨٦	١٠٠	٠	٠.٠	٠	٠.٠	٠	٠.٠	٦.٦٣١	٠.٠٠ ١
Mean± SD	١١.٦٦±١ ٤.٣١				٠.٠٠±٠.٠٠٠					

Table (٤): Showed that there was a highly statistical significant difference (P value <٠.٠٠١) between study and control groups in relation to their total knowledge, practice and attitude score in study group.

V. Discussion

Technology has changed our world, changed the way of communicate, the way we do business and the way education is delivered. The undergraduate student come to university equipped with new technology, and educators need to transform the delivery of the curricula to satisfy a variety of learning styles. Nursing education, in particular, is developing and transforming to incorporate technology into the learning environment. Clinical placement opportunities are often sparse and alternative experiences need to be considered. Across nursing curricula, it has been recognized that technology has the capacity to provide real-life learning experiences that, promote student engagement and meet the learning needs. Virtual Reality (VR) is technology that have become popular in recent years and have been successfully used in applications for nursing education(**Jenson, et al., ٢٠١٢).**The aim of the current study is to evaluate the effective of interactively virtual reality eyeglasses on improve the academic performance of pediatric nursing student

Regarding to characteristics of the studied students, the majority of the study and control groups are ranged between ٢٠-٢٢ years old. In relation to students gender more than half of the study and control groups are females. In addition, the majority of the study and control groups aren't used of virtual reality eyeglasses. The study findings are in an accordance with **Christidou,(٢٠١١),** which study entitled" Interest, attitudes and images related to science combining students voice with the voices of school science, teachers and popular sciences", who reported that, students and especially girls having low interest in science and their relatively negative attitudes are at least partially attributed to the way relevant disciplines are taught at school. Also, the findings of the current study are similar to a study by **Mendelson, (٢٠١٣),**which study entitled "Are there side effects to watching ٣D movies", who reported that, participants were between ١٨ and ٦٥ years of age, with more than half of them (٥٤.١٪) between ١٨ and ٢٥ years of age. Females (٥٥.٩٪) were slightly more than males and university students (٤٩.٩٪), ٣٥.٦٪ report to use of computer and/or video game console for more than ٥ hours per day. The difference in the findings may be related to the difference in the study subjects and setting.

The table(١): results of the research confirmed that, the student knowledge about virtual reality eye, the majority of the study group and control groups have wrong or unknown answer regarding definition, types, causes and importance of virtual reality, in the pre-training. While the majority of them have complete correct answer regarding knowledge about virtual reality, in post training.

The findings are in accordance with finding of **Kyaw, et al.(٢٠١٦),**which study entitled "Virtual reality environments for health professional education protocol", who illustrated that, virtual reality eyeglass is an innovative, three-dimensional technological educational tool that can bridge the gap between theory and practice for nursing students and transform nursing education by decreasing student anxiety and patient safety concerns. Incorporated VR eyeglass technologies in which the student can practice patient care in true to life clinical scenarios within a safe environment In addition of Virtual worlds that support a realistic learning environment within a curriculum, such as increased learner engagement, improved critical thinking, decision-making, and self-efficacy as well as a high level of student satisfaction. In nursing education, students hail from a diversity of backgrounds. incorporated of the VR into the nursing curriculum ensures that students achieve the intended learning outcomes in a planned and progressive manner, without omissions or unnecessary duplication of student and staff effort. Inaddition, this study accordance with **Ewens, et al .,(٢٠١٦).**which study entitled "Humanizing the curriculum the role of virtual world", who showed that, videos is used to support development of the knowledge, skills and attitudes necessary for professional nursing practice. Students watch videotaped interviews of senior nurses who have achieved advanced roles or recognition in a specific area of practice or study, to which the students may wish to aspire Students need to be highly engaged in learning at a level that supports applying knowledge, theorizing and critically reflecting. To achieve this level of engagement, the learning environment should include real-world work activities where possible. Learning in virtual worlds

changes the focus of education from traditional teacher centered knowledge sharing to student centered, immersive learning experiences. Greater emphasis is put on learning as a process rather than on specified learning objectives and outcomes. In nurses' professional development, learning is often experiential in nature.

Also **Koivisto,(٢٠١٧),**which study entitled" Learning clinical reasoning through game based simulation",who founded that, nursing students receiving pediatric respiratory disease content using virtual training have significantly higher knowledge acquisition and better knowledge application than students in the traditional lecture group.

This study accordance with **Beijing, (٢٠١٦),**which study entitled "the impact of VR on academic performance", who illustrated that, the average score of VR group is ٩٠٪, while that of the traditional teaching group is ٦٨٪. The gap between the two average scores is ٣٢.٤٪, higher than that in the immediate test. This may be due to knowledge taught in traditional mode is more inclined to be forgotten, while VR-based teaching could help students get a deeper impression and maintain long-term memory because student become more interact and involved in real environment.

This may be attributed to the most students lack interest in boring teaching and learning. They are easily distracted if the knowledge taught in class is dry and plain

Table(٢): The results of the study confirmed that, the distribution of the studied student's practice, the majority of the control group not done oxygen, CPR and drug administration in the pre training. While more than three quarter of them done correctly in the post training. Moreover, there was a highly statistically significant difference (p <٠.٠٠١) in favor of post training in study group. This study accordance with **Tan and Waugh, (٢٠١٣),** which study entitled "Use of virtual reality in teaching and learning molecular biology", who reported that, a marked positive effect of the use of ٣D animations on learning, recall and performance in tests. Under experimental conditions, ٨٦٪ of students improved from the pre-test to the post-test in the ٣D classes. The marked improvement in test scores was also supported by qualitative data that showed that ١٠٠٪ of teachers agreed or strongly agreed that ٣D animations in the classroom made the students understand things better, and ١٠٠٪ of teachers agreed or strongly agreed that the students discovered new things in ٣D learning that they did not know before..

This study also accordance with **Ji and Liu,(٢٠١٦),** which study entitled "Development of an intelligent teaching system based on ٣D technology in the course of digital animation production", who illustrated that, the overall score of students in the experimental group in pre and post test examination modules is higher than that of their counterparts in the control group. The differences in scores of three modules, including basic knowledge, important and difficult points, and experimental operations are statistically significant (p < ٠.٠٠١). As for the total test score, the experimental group surpassed the control group, showing significant advantages (p < ٠.٠٠١).

This study produced results which corroborate the findings of **Thisgaard, and Makransky.(٢٠١٧),**which study entitled "Virtual reality learning stimulations in high school effects on cognitive and non-cognitive outcomes and implication on the development of stem academic and career choice", who showed that, the majority of nursing students prefer a hands-on, active approach to education. However, studying the attitude and motivation of students in VR environments do not compare the effectiveness of ٣D versus ٢D environments. With respect to the effectiveness of learning through the use of VR in ٣D that students are more receptive to understand aspects of anatomy using ٣D than using ٢D. In comparing the teaching of musculoskeletal anatomy through VR traditional methods, indicate that VR can serve as a complement to traditional methods of teaching anatomy**.** Virtual learning applications can provide the tools to learn in a quick and happy mode by playing in virtual environment. Also show how VR has been introduced in the curriculum as an immersive tool for learning and facilitating the imagination of the anatomical structures, improving satisfaction and motivation of students during their learning process.

This finding is in concurrence with **Wright and Renee, (٢٠١٨),**which study entitled "Using ٣D simulation in nursing educations", who illustrated that, clinical experience is the very foundation of health care practice disciplines. This includes nursing, especially. They prove valuable for their ability to enhance both theoretical and clinical nursing education. Both teaching strategies have proven to be resource intensive in the use of nursing staff, manikins, and other tools to increase the fidelity of such teaching scenarios.

Table(٣):The current study illustrated that, the majority of the study group have a positive attitudes towards virtual reality environment in the post training in relation to control group. This study accordance with **Bamford, (٢٠١١),**which study entitled "The ٣D in education white paper", who showed that, ١٠٠٪ of teachers felt that the students paid more attention in ٣D lessons than other lessons, and ٧٠٪ of teachers noted that the students' behavior had improved when using the ٣D. This may be from the researcher's point of view due to increased levels of attentiveness during and after VR simulation.

Also **Hung, et al. (٢٠١٠),** which study entitled "effects of full immersive virtual reality on the learning of physical tasks", agreed with the study, the application of interactively virtual reality into the instruction of

natural science, students showed definite and positive attitudes with the average affirmation of ٤.٤٦. The further expected interactively virtual reality being applied into the instruction of natural science, which conformed to the study on the acceptance of applying ٣D virtual reality into medical education that the application of interactively computerized virtual reality was mostly accepted by student. The experimental group had better learning achievement than the control group after the learning activity. So, the effectiveness of the present approach could be due to the ٣Danimations, the virtual reality system, or both. It is worth investigating the roles of these two technologies in improving the learning achievements of the students in the future.

This finding is in concurrence **Fairén, et al.,(٢٠١٧),**which study entitled "Virtual reality to teach anatomy Euro graphics", who showed that, students' attitudes toward learning environments when use VR. The VREG can be motivated students to learn more effectively**.** Virtual reality provides technological advances regarding image and degree of immersion, which allow to students deal with restrictions that plastic models. The use of various VR technologies can be increase focusing on the learning process. An important aspect to take into account is the motivation and makes the students be passively seated in a classroom, watching a teacher explaining a PowerPoint presentation for one or two hours. Instead, by using virtual reality the students live an active experience, where immersion make students fully engaged in the activity, without distractions. This allows for students to focus all attention on what they are doing.

Table(٤): The findings are also showed that, the total knowledge, practice and attitude scores of studied students, there was a highly statistical significant difference between study and control groups in relation to their total knowledge, practice and attitude score in favor of post training. This study accordance with **Bridge, et al. (٢٠١٤),**which study entitled "the development and evaluation of medical imaging training immersive environment", who illustrated that, high students levels of satisfaction and perceived value about ability of software to ٤٠ concurrent users to prepare for clinical practice. A randomized comparison between groups receiving software-based and traditional practice measured performance in a formative role play with real equipment. The results of this work indicated superior performance with the equipment for the VR trained students (P = ٠.٠٣٦٦) and confirmed the value of VR for enhancing ٣D equipment-based problem-solving skills immersive environment. Additionally, **Green, et al.,(٢٠١٤),**which study entitled "Virtual worlds: Anew frontier for nurse education collegian", shows that, male students' achievement differed significantly from that of female students when both were taught with virtual laboratory. The mean gain scores between the pretest and posttest of male and female students using virtual laboratory in individualized setting.

Also, **Koivisto,(٢٠١٧),**which study entitled "Learning clinical reasoning through game based simulation", who reported that, nursing students have reported that, virtual reality eyeglass allow students to apply their knowledge and skills. Virtual scenarios provide a safe learning environment to practice clinical skills and learn from mistakes without harming real patients. Also the study found that, virtual simulations should offer repetition of key learning points and tasks. Repetition helps nursing students to internalize and automate procedures, teaching them to priorities by making their own decisions and seeing the concrete consequences, thus preparing the students for real clinical reasoning situations.

This finding is in concurrence with **Wang, et al.,(٢٠١٧),**which study entitled "Augmented reality as a telemedicine plat form for remote procedural training", who illustrated that, the goal of VR in nursing education is to support students in acquiring the knowledge and competencies required to provide a good quality of care. Under graduated nurse should be prepared to practice safely, accurately, and compassionately in various settings to be able to conduct safe and effective care for patients in different settings.

VI. Conclusion
Based on the results of the present study, the study was concluded that, the virtual reality eyeglass as a learning tool can help students to achieve or perform well. The pediatric nursing students gain a satisfactory knowledge and improve their practice skills and attitude toward the virtual reality eyeglasses are improved.

Recommendations
• Nursing education programs should support the introduction of interactive virtual reality in pediatric nursing curriculum to capitalize the technological skills of the new generation students.
• Virtual reality should be included in nursing education to make all learners with online access to effective teaching/learning opportunities.

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