Comparison between Traditional and Flipped Learning on Nursing Students Achievement and Satisfaction regarding Postpartum Care Topics

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Abstract: Background: Rapid changes in the nursing profession require the use of innovative educational approaches in educational nursing programs. The flipped teaching strategy is an active learning strategy to enhance students' critical thinking ability and competencies when caring for post-partum women and raise students' satisfaction with learning. *Objective*: This study aimed to compare traditional versus flipped learning on maternal and newborn health nursing students' achievement and satisfaction regarding postpartum care topics *Methods*: A quasi-experimental design was applied with pre- and post-test assessments in the experimental and control groups. *The tools*: Five tools were used in data collection namely, Interview questionnaire, Pre & post-test, postpartum evaluation sheet, observational checklist for postpartum care and student satisfaction survey. *Results*: The majority of students' mean age was $20.70 \pm 0.73 \& 20.55 \pm 0.60$ (for the control & study groups respectively). The study results showed that highly significant differences between the two groups in the average knowledge scores before and after the test with regard to postpartum nursing care. The findings also showed that there are highly statistically significant differences between the two groups in the average scores between students in the mid-semester and final exam in various question topics. It can be **concluded** that, the impact of the flipped classroom increasing satisfactory level of knowledge regarding post-partum topics in terms of examination or assessment results and in contrast with clinical practices it was the same result of performance among two groups in term of demonstrations clinical procedures and application of care in hospital clinical skills. The study **recommended** that replicating this study in other nursing and medical courses.

Keywords: Traditional learning Flipped classroom, Student Satisfaction, Achievement Postpartum Topics

INTRODUCTION

At the beginning of the twenty-first century, researchers discovered a huge gap between nursing education and nursing practice; this led to calls for an essential transformation of nursing education. This call urged nursing teachers to plan learning experiences that will prepare graduate nurses well to practice in a rapidly changing healthcare environment. To that end, *MacKinnon et al., (2017)* suggested changes in the educational system, such as moving away from teaching decontextualized knowledge, better integration of active learning in the classroom, and an increased confirmation on teaching clinical reasoning. New and innovative instructional strategies must be integrated with nursing education to achieve these goals *(Oliver and Luther, 2020)*.

With the advancement of technology and the enrichment of online educational resources, educational institutions worldwide are witnessing a massive trend toward the integration of technology within their education and learning methodology *(Kintu, et al., 2017)*. The center of the learning process is being changed from teacher-centered, direct instruction to student-centered learning *(MacKinnon et al., 2017)*.

Traditional learning is a learning process where both learners and teachers are physically present in the same place at the same time. The process of learning requires direct contact between the educator and the student while the sender here is the educator, and the recipient is the

student *(Asarta & Schmidt, 2017)*. The traditional lecture-based teaching model is not an effective way for students to acquire new knowledge. Therefore, nursing educators have emphasized the importance of active learning strategies that allow students to engage in the learning process and interact with the curriculum's contents via diverse activities that promote critical thinking *(AlJaser, 2017)*.

Flipped classroom method is rapidly increasing in popularity in healthcare educational system to activating or facilitating students' interaction in the learning process. In this method of teaching, leaners read the teaching materials provided by the lecturers before a class and write down important points or questions *(Betihavas et al., 2016)*.

The classroom is turned from traditional one-way teaching to student-centered two-way learning activities like discussions, debates, and cases study. The instructors encourage the students to answer questions, clarify confusions in the classroom to help them establish correct concepts, stimulate thinking, give them guidance in problem-solving, and help students in knowledge application *(Lee & Park, 2018)*.

Chuang, (2018) mentioned that the four pillars of flipped learning are F (Flexible learning environments), L (Learning culture), I (Intentional content), and P (Professional educator). Several local and foreign studies have used flipped learning in nursing education and illustrated that it can stimulate positive responses in knowledge, skill, attitude, self-efficacy, and learning satisfaction. Flipped

learning is a chance for great contact time between faculty and students. In addition, a flipped classroom can spark interest in higher education and give a student-centered learning approach which meets the existing needs of nursing staff and improves their learning motivation (*Park and Park 2018*).

Moreover*, Fan et al., (2020)* demonstrated that flipped classroom combined with a hybrid teaching course structure, provides students with not only a flexible way to learn materials at their private pace before class (autonomy) but also reinforces students' in-class discussion with peers, reevaluates students' strengths and weaknesses (competence). Finally, the flipped classroom may help students to improve self-directed learning skills and develop life-long learning habits.

A mother's postpartum period is a crucial time of a woman's life, women have experienced new and different experiences of childbirth, and they are also trying to figure out how to be a mother and take care of an infant at the same time. It is also time of imbalance which involves profound endocrine, general somatic and psychological changes. This disequilibrium necessitates adequate continuous health supervision (*Doaa et al., 2018*). Thus, postnatal care is one of the most important maternal healthcare goals through fundal assessment and examination during puerperium for early detection of any complication such as postpartum hemorrhage (*Mohammad & Khaleel, 2019*).

Most postpartum complications are considered preventable if postpartum observation and examination started effectively. Nearly 216 women died worldwide from 100,000 women owing to PP complications. In Egypt are 37 maternal deaths per 100,000 deaths (*World Health Organization, 2017*). Thus, reduction of maternal deaths is one of the major objectives of several recent international strategies. In order to reach these objectives, this study was conducted to compare the traditional versus flipped classroom teaching approach on achievement and satisfaction among maternal and newborn health nursing students regarding postpartum women's care.

Significance of the Study:
Nursing education, especially theoretical and practical courses, requires innovative interactive teaching strategies to accommodate the requirements of competency-based programs. In addition, student learning outcomes that highpoint students' competency to solve problems and apply theory into practice made an urgent need for educational reform, especially among undergraduate students (*Doaa et al., 2018*).

Maternal and newborn health nursing is a branch of nursing that has a significant role in promoting the health of mothers and children and requires nursing students to be qualified in their care provided. Still, opportunities to enhance competence in nursing schools are limited due to many factors such as shortage of faculty teaching staff, lack of training opportunities in hospitals, limited opportunity for skills demonstration and re-demonstration, and an increase in the number of students enrolled in nursing programs. Thus, these challenges affect the students' readiness to be

qualified and skilled. Consequently, the level of students' academic achievement and satisfaction with the educational process are not satisfactory (*Mohammad & Khaleel, 2019*).

The application of an interactive teaching model enables students to learn more cooperatively and think critically. Therefore, this study was carried out to compare traditional versus flipped learning on maternal and newborn health nursing students' achievement and satisfaction regarding postpartum care topics.

Aim of the Study:
The present study aims to compare traditional versus flipped learning on maternal and newborn health nursing students' achievement and satisfaction regarding postpartum care topics

This aim was achieved through:
1. Preparing the classroom activities and educational material in both traditional and flipped teaching approaches (in the theoretical and practical part of the postpartum care) and testing its validity.
2. Implementing the two different teaching approaches traditional/ flipped classroom
3. Comparing achievement of the students subjected to traditional teaching methods and students subjected to the filliped classroom through midterm and the final courses examination.
4. Identifying the students' satisfaction level regarding the filliped classroom versus the traditional teaching strategy.

Research Hypothesis:
1. The flipped classroom teaching approach will improve the maternal and newborn health nursing students' achievement in the theoretical part of postpartum care topics than the traditional method of teaching.
2. The flipped classroom teaching approach will improve the maternal and newborn health nursing students' achievement in practical part of postpartum care topics than the traditional method of teaching.
3. Maternal and newborn health nursing students who will be taught postpartum care by flipped classroom approach will have a positive satisfaction toward the teaching strategy than those who will be taught by the traditional method.

Operational Definitions:
Flipped Learning is an approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is changed into a dynamic, interactive learning environment where the instructor directs students when they apply concepts and engage creatively in the subject matter.

SUBJECTS AND METHODS

Research Design:
A quasi-experimental design [experimental group (EG) and control group (CG)] was used to achieve the objective of the study. Level three Maternal and Neonatal Nursing students were potential participants. To minimize intervention "contamination" between experimental and control participants, the study was carried out with two classes of

(147) students in the fall of 2019 (76 students) and spring of 2020 (71 students) semesters at the School of Nursing, Badr University in Cairo, Egypt.

Study Setting:

This study was conducted at the School of Nursing, Badr University in Cairo. It is a private Egyptian university, a campus equipped with the latest and most advanced technologies, resources, and educational facilities. The mission statement of the university and the school of nursing are matched together to provide undergraduate students with a high-quality learning environment to enable them to deliver outstanding and evidence-based nursing care. Students get their educational activities in (the classroom and nursing skills lab) and implement what they have learned in the maternity hospital of a large teaching hospital in Cairo - Egypt.

Sample Type: A convenient sample was used in the study

STUDY SUBJECTS

Inclusion criteria: All students registered in Maternal and Neonatal Health Nursing (Theory – Practice Courses (NUR 3531-NUR 3532) for the first time and having basic computer skills.

Exclusion criteria: previously course registered students

Tools of Data Collection:

Data of the study were designed and collected by the researchers in English language, after reviewing the related current and previous national and international literature included:

Tool (1) Interview Questionnaire:

Interview questionnaire sheet was applied for both (Experimental & Control) groups. It included student's characteristics such as: age, learning experiences, group code, computer skills, current semester credits and previous-semester grade point average (GPA).

Tool (2) Students Knowledge Level Regarding Post-Partum Women Care:

1- **Pre/post-tests** to assess students' knowledge in both groups (Experimental & Control) in postpartum care. The pre/post-tests consist of (36) questions in the form of multiple- choice questions (MCQs). It consists of six sections to assess student's knowledge regarding [physiological adaptations to the postpartum period (six questions), minor discomforts (six questions), postpartum assessment (six questions), postpartum complication (six questions), nursing care for postpartum women (Six questions) and neonatal care (six questions).
2- **Mid Term and Final Exam** part of questions related to post-partum women's care scored as 10 scores for the midterm and 30 scores for final

The scoring system of Pre & post-test and examination: One mark was given for each correct answer and zero for the incorrect one. Knowledge level was considered Unsatisfactory: if the percent score was less than 60%, and Satisfactory: if the percent score was ≥ 60%.

Tool (3) Postpartum Care Clinical Training Evaluation Sheet:

The evaluation sheet was designed by the maternity nursing-school of nursing teaching staff according to the nursing process and communication skills to assess students'skills & performance in both groups (Experimental & Control) regarding postpartum care. The total scoring for this tool is 40 Grads, more than 60% satisfactory level of performance and less than 60% unsatisfactory level of performance. Cronbach's α for this tool was measured as (0.91).

Tool (4) Observational Checklist for Postpartum Care:

The checklist was designed by the staff of the jury of maternity& newborn nursing faculty of nursing to assess student's skills in the laboratory for both groups (study & Control) groups which include fundus and lochia assessment, Perineal assessment & care, episiotomy care, breast care, and neonatal care.

The scoring system of the student's checklist: three-pint rubrics scale as two marks were given if the step was done correctly and one if the step was done incompletely and zero for incorrectly or was not done step. The total scoring for all 40 Grads, ismore than 60% satisfactory level of performance and less than 60% unsatisfactory level of performance

Tool (5) Student Satisfaction Survey:

Student satisfaction questionnaire was developed by researchers based on (National Authority for Quality Assurance and Accreditation of Education "NAQAAE" 2015). This questionnaire has 35 items grouped into four subscales: teacher's teaching (14 items), course content (8 items), learning environment (10 items), and administrative service (3 items). The students were to select their perception of that aspect of instruction from ineffective to very effective. The range of responses (from 1-5, respectively) was: ineffective=1score, some what effective= 2score, moderately effective=3score, effective=4score, and very effective=5 score. "The survey summarized items included instructor helpfulness, concern, and willingness to listen to learners, use of examples, availability of extra help, use of questioning, constructive lecture management, presentation of information in interesting manner, ability to summarize important points, and use of web technologies in instruction. The total scoring for all 50 grads, more than 60% is satisfied less than 60% unsatisfied. Cronbach's α for this survey was measured as (0.93).

Pilot Study:

The pilot study was carried out on (15 students) 10% of the study students. The pilot study was done to ensure clarity, applicability, the feasibility of the study tools, and the time needed for each tool to be filled in. No modifications were needed to the tools of data collection based on the finding of the pilot study. Students included in the pilot study were not excluded from the main study sample because they cannot be excluded from registration for this year.

Validity of the Tools:

The content validity of the tools was revised by 5 experts in Maternity and Neonatal Health Nursing to test content validity and according to their opinions; no major modifications were carried out in the content.

Administrative and Ethical Considerations:

To conduct the study, the researchers took approval through official letters containing the objective of the study that was directed from the researchers to the Dean of the School of Nursing at Badr University in Cairo, as well as the head of the department to obtain permission and assistance in conducting the study in the college. The researcher explained the purpose of the study to the students and explained why the flipped classroom is a useful tool for learning and for realizing why this teaching strategy will be used.

Field work:

Planning and Assessment Phase:

This phase included the following:
- Reviewing the available literature and different studies related to the research, and theoretical knowledge of its various aspects using textbooks, evidence-based articles, and the internet.
- Measuring content validity and reliability for data collection tools was established by a panel of three expert staff members in maternal and neonatal Nursing and Obstetrics medicine.
- Preparing instructional material (theoretical and clinical practices procedures, situations, videos, quizzes PowerPoint presentation

Implementation Phase:

The process of data collection was carried out from October 2019 to June 2020.

Flipped Classroom Intervention:

In the present study, a flipped classroom was implemented in teaching post-partum nursing care as part of two courses (Maternal and Newborn Nursing Theory NUR3531- Practices Courses NUR3532) these courses are allocated in a bachelor program for level three undergraduates' student. It incorporated face-to-face TBL and simulation activity and online self-directed learning (via the "learning management system LMS-campus" platform).

The reasons behind choosing this courses in the RN-to-BSN program curriculum at the third level were because its application and use play an important role in clinical practice, in addition to the fact that its practical application plays an important role in the early detection of many fatal problems faced by post-partum women such as postpartum hemorrhage and, embolism In addition, women need much advice taken home after leaving the hospital. Furthermore, neonatal care is needed. In addition, the flipped classrooms may help students have a better understanding of the cultural, economic, and social issues affecting patients which makes students get satisfactory learning achievements and Grade Point Average (GPA) scores.

Before the flipped classroom was implemented, we held several faculty-training sessions on LMS campus to ensure consistency in content and teaching materials, including quiz questions used in TBL (in-class), the simulation scenario (in-class), the assignment format (post-class), and reading materials (pre-class).

The maternal and neonatal nursing courses are a seven-credit course taught during the third level in the 1st and 2nd semester academic year 2019-2020. In terms of the content of the maternal and neonatal health nursing health the two courses were divided into three blocks for 6 topics nursing care for pregnant women (normal and high-risk pregnancy) nursing care during childbirth (normal and complicated labor) and nursing care of post-partum women and neonates (normal and complicated post-partum and neonates. We adapted an in-depth approach to course contents by integrating physiological changes, physical assessments, nursing care, and psychosocial issues. The researchers selected in this study the third topic post-partum and neonatal care.

The first phase was an online self-directed learning pre-class phase in which students reviewed assigned reading materials via the online LMS campus platform. Two weeks before the topic schedule began, the instructor was asked to upload reading materials (e.g., syllabus, related material power point presentation or videos, case descriptions for simulation exercises, assignments, and reflection and evaluation forms).

The second phase was a face-to-face TBL in class activity. The two- to four-hour TBL process began with an individual quiz, followed by a group discussion, and ended with an appeal or argument process. The third phase was a face-to-face simulation activity in a laboratory. There was a two- to four-hour simulation exercise related to the TBL content, with a case based on actual clinical practice. The last phase involved completing a post-class assignment on LMS-campus. The students were asked to submit their completed assignments, reflection reports, and course evaluations, as well as any comments they had concerning the LMS-campus platform. The LMS-campus platform also facilitated interaction, discussion, and announcements.

Traditional Teaching:

In the first phase, 2 weeks before the topic schedule began, it was optional for the instructor to upload teaching materials or videos online and the students were not required to review materials or videos before the course began. ***The second phase*** was face-to-face traditional classroom teaching during which the instructor delivered the knowledge mostly using slides. ***The third phase*** was a face-to-face simulation activity (at least 1 simulation activity). The students participated in the classroom and laboratory activities in both face-to-face phases. The last phase, the instructor competed a written evaluation of the course in the form of a written report and/or revised the course design for next semester. The students were asked to submit homework reports and evaluate the course. **Figure (1)** shows the flipped classroom and traditional teaching procedures.

Evaluation Phase:

In this phase, the researchers collected the pre/post test scores and checklist scores of practical skills for all students in both groups. Finally, the mid-term and final exams post-partum care related questions were used to evaluate students' achievements regarding theoretical course and Clinical evaluation and procedures checklist scores to assess practice course. By the end of each term, a Likert scale was

distributed to the students to assess their attitude regarding the teaching strategy used.

Limitations of the Study:

- Because of the Covid-19 crisis and the policy of distancing. The hospital implemented an early postpartum discharge procedure which limited training opportunities, but these limitations were overcome by

- simulation - scenarios in the skills lab to assess student performance.

- Further, only short-term knowledge was assessed when lectures were moved to online videos. The flipped classroom approach uses active learning methods, which could help enhance students' long-term memory. Additional studies should investigate the impact of this instructional approach over the longer term.
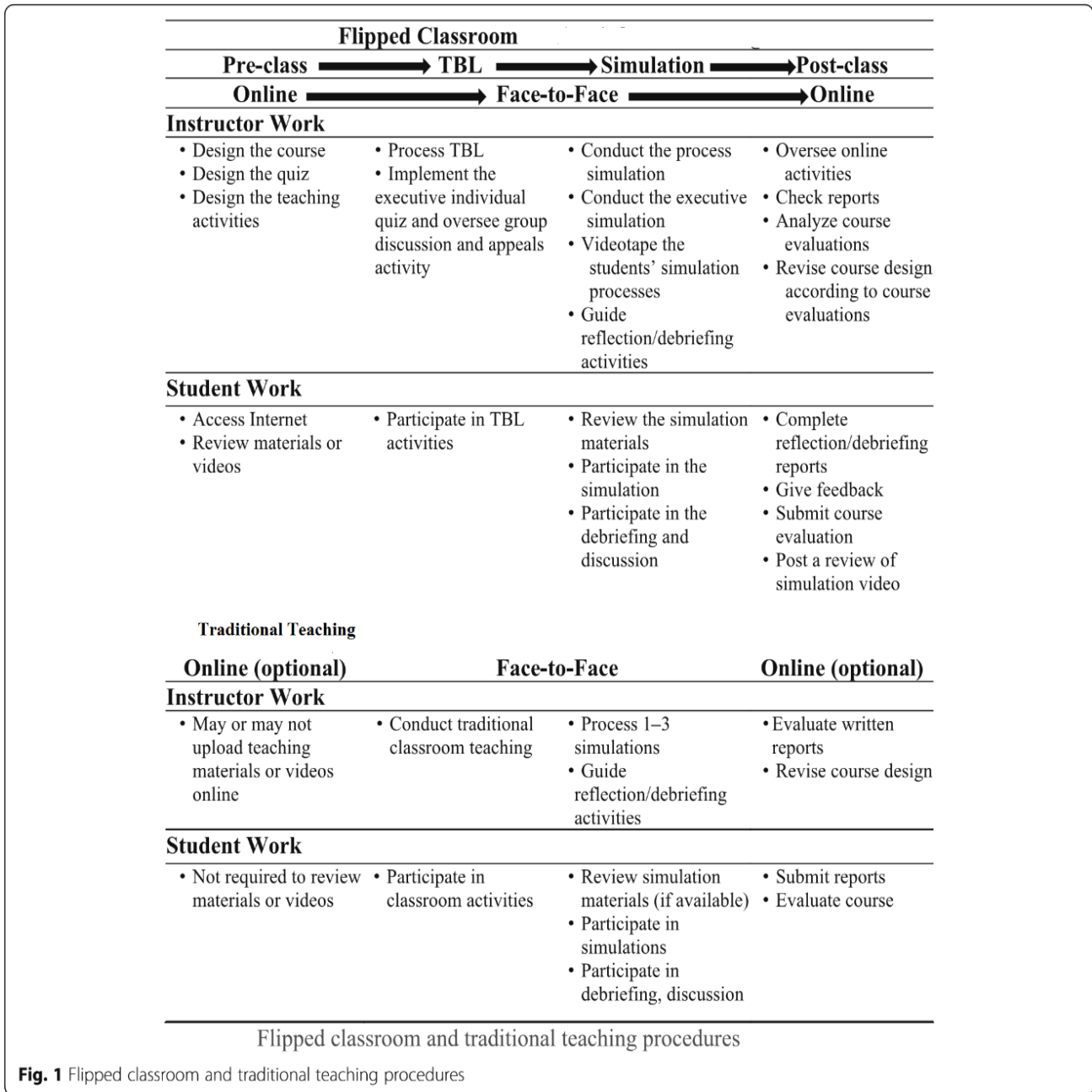

Fig. 1 Flipped classroom and traditional teaching procedures

Fig (1)The Flipped Classroom and Traditional Teaching Procedures.

Chen, F., Lui, A. M., & Martinelli, S. M. (2017): A systematic review of the effectiveness of flipped classrooms in medical education. *Medical Education; 51*(6), 585–597. https://onlinelibrary.wiley.com/doi/10.1111/medu.13272

Statistical Analysis:

Data entry and statistical analysis were done using the Statistical Package for Social Science (SPSS), version 18.0,a statistical software package. Results were presented infrequencies and percentages. Independent–samples t-test analysis was used to test statistical significance of some variables and to test effectiveness of the intervention between the two groups. Statistical significance was considered at p ≤.05.

RESULTS

Table (1): Distribution of the Students by Their Characteristics in Both Groups (N=147)

Students' characteristics	Control Group N=71		Experimental Group N=76		Statistical Comparison	
	N	%	N=76	%	t-test	p-value
Mean Age (in Years) ± SD	20.70 ± 0.73		20.55 ± 0.60		1.59	0.55
Gender:					1.57	0.22
- Female	42	59.2	43	56.6		
- Male	29	40.8	33	43.4		
Learning Experience					1.81	0.23
- Secondary School	66	93.0	70	92.1		
- Technical Institute	5	7.0	6	7.9		
Grade-Point AverageMean ± SD					1.76	0.18
- >3.0- 4 (%)	14	19.7	16	21.1		
- 2.4-3	57	80.3	60	78.9		
Mean Credits Per Semester ± SD	16.10 ± 1.15		16.84 ± 1.37		1.83	0.12
Computer Access at Home					1.76	0.21
- Yes	69	97.2	73	96.1		
- No	2	2.8	3	3.9		
Internet Access at Home					1.49	0.39
- Yes	71	100.0	76	100.0		
- No	0	0.0	0	0.0		
Computer Basic Skills					1.49	.39
- Satisfactory	71	100.0	76	100.0		
- Unsatisfactory	0.0	0.0	0	0.0		

Table (1) the results of the table shows that there are no statistically significant differences regarding the characteristics of students in the two groups (Control and Experimental).

Table (2): Distribution of Students by Their Pre/Post-test Knowledge Scores in Both Groups (N=147)

Student's knowledge level	Control Group N=71				Experimental Group N=76				t-test	p-value
	Pre		Post		Pre		Post			
	N	%	N	%	N	%	N	%		
- Satisfactory	0	0.00	59	83.1	0	0	70	92.1	26.9	.000
- Unsatisfactory	71	100.0	12	16.9	76	100.0	6	7.9		
- Mean ±SD	10.9±1.2		30.4±3.7		11.20±2.7		34.2±1.6			

Table (2) It shows that there are highly significant differences between the two groups (control and experimental) in the average knowledge scores before and after the test with regard to postpartum physiological and psychological adjustment, minor postpartum discomfort, postpartum assessment, postpartum complications, and postpartum nursing care, and p=0.000.

Table (3): Distribution of Students by Their Satisfactory Examination Scores in Both Groups (N=147)

Satisfactory Examination Score	Control Group N=71		Experimental Group N=76		t-test	p-value
	N	%	N	%		
- Mid Term	59	83.1	69	90.8	28.1	.001
- Mean score ±SD	7.4±1.7		8.6±1.2			
- Final	62	87.3	71	93.4	27.6	.001
- Mean score ±SD	26.2±2.6		28.1±1.8			

Table (3) shows that there are highly statistically significant differences between the two groups (control and experimental) in the average scores between students in the mid-semester and final exam in various question topics such as psychological adjustment after childbirth, minor postpartum discomfort, postpartum evaluation, and postpartum assessment, postpartum nursing care, health teaching after delivery, postpartum complications and their treatment, and neonatal care, and p = .001.

Table (4):Distribution of Students by Their Performance in Postpartum Care Procedures Checklist (N=147)

Student's Performance	Control Group N=71		Experimental Group N=76		t-test	p-value
	N	%	N	%		
Getting Ready Steps:						
- Satisfactory	65	91.5	71	93.4		
- Unsatisfactory	6	8.5	5	6.6	2.5	0.08
- Mean± SD	8.2±1.3		9.1±.0.6			
Procedure Steps:						
- Satisfactory	66	93.0	72	94.7		
- Unsatisfactory	5	7.0	4	5.3	3.6	0.18
- Mean± SD	17.6±1.3		18.3±1.6			
Post Procedure Steps:						
- Satisfactory	66	93.0	73	96.1		
- Unsatisfactory	5	7.0	3	3.9	3.1	0.13
- Mean± SD	8.7±1.5		9.3±.0.7			

Table (4) shows that there are no statistically significant differences between the average scores of the checklist of procedures performance in both groups in terms of preparation steps, procedures steps and post-procedures, and p > 0.05.

Table (5: Distribution of Students by Their Clinical Evaluation Performance in Postpartum Care (N=147)

Student's Performance	Control Group N=71		Experimental Group N=76		t- test	p- value
	N	%	N	%		
- Satisfactory	66	93.0	72	94.7		
- Unsatisfactory	5	7.0	4	5.3	.152	.130
- Mean ±SD	32.9±3.4		35.0±.2.2			

Table (5) shows that there are no statistically significant differences between the average scores of clinical assessment performance in both groups with regard to the application of postpartum care, whether in the hospital or in the skills lab, p > 0.05
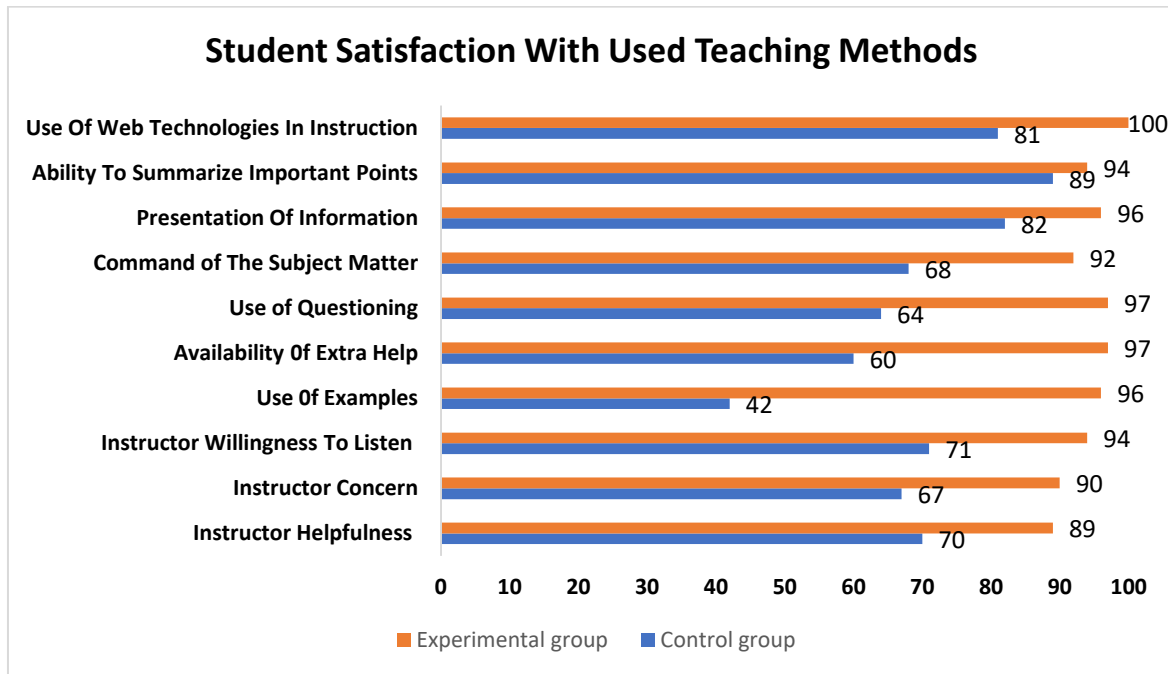

Figure (2) Students Satisfaction with their Used Teaching Methods (Traditional learning & Filliped Class)

Figure (2) demonstrates statistically significant improvements in the experimental group regarding the level of satisfaction with the flipped learning approach compared with traditional learning methods as hundred percent of the study group shows completely satisfaction for use of web technologies in instruction and more than 90% have the ability to summarize the important point.

DISCUSSION

Flipped classroom studies in higher education are rare, and only a limited number have focused on the effectiveness of this approach in nursing education. To our knowledge, this study is the first to test the effectiveness of flipping in the classroom when teaching post-partum topics for maternity nursing student.

Initially popularized in the United States, flipped classrooms replace teacher-led in-class instructions with individual homework or group activities. Recently, the flipped classroom approach has made inroads into health professions education and has even been touted "a new paradigm" in medical education *(Ramnanan and Pound, 2017)*.

Chuang, (2018) mentioned that the flipped learning is an opportunity for increased contact time between faculty and students. Learners clarify and apply previous learning, connect this learning to clinical case scenarios, and apply classroom teachings to their work in the clinical setting. In addition, a "flipped classroom" can spark interest in higher education and offer a student-centered learning approach, which satisfies the existing needs of nursing staff and improves their learning motivation. This teaching method is consistent with the requirements for clinical nurses.

The current a quasi- experimental study was carried out to study aims to compare traditional versus flipped learning on maternal and newborn health nursing students' achievement and satisfaction regarding postpartum care topics. The current study findings regarding students' characteristics are quite homogenous in both groups with no statistically significant differences in age, gender, GPA, semester registered credits and ability of students to use computers as well as availability and access of home computer with internet.

The majority of students' mean age was $20.70 \pm 0.73 \& 20.55 \pm 0.60$ (for the control & study groups respectively).This result was in accordance with *Fan et al., (2020)* study in Taiwan who found that a total of 485 nursing students participated the mean age is $20.18 \pm .59$, in terms of homogeneity between groups. While *Afzal et al., (2019)* study in Pakistan reported that, the majority of the students were in the age group of 23 years for about half of the study sample and about two fifth were in the age of 24 years.

As regards availability of computer and internet access at home in both groups, the result of the current study showed that, the majority of the study sample for both groups had computer and internet access at home, with no statistically significant differences between the study and control group. The researchers found that is one of promising results to engage students in their used teaching methods.

A study carried out by *Yilmaz, (2017)* aimed at exploring the role of e-learning readiness on student satisfaction and motivation in flipped classroom, the results of their study revealed that no statistically significant difference between the control& study groups concerning the availability of computer and internet access at home.

In relation to student's proficiency computer basic skills level, the result showed that all students in both groups had satisfactory level in computer basic skills, with no statistically significant difference between both groups. The researchers found that is the post-partum subjects were taught in the level three and students were familiar with basic computer use as well as learning management system in campus from the first academic level.

The result of the present study is in accordance with the study which carried out by *Hassona et al., (2019)* to assess and compare nursing students' computer self-efficacy and attitudes toward its use in a health care setting. He reported the highest percentage of nursing students from Benha University have a realistic view of current computer capabilities in health care. In contrast, the highest percentage of nursing students from Hail had a very positive view of computer use in health care.

This interpretation was supported by *Herath & Mathotaarachchi (2018)*, who demonstrated that IT knowledge and experience can contribute to students' positive attitudes toward working with computers, their exposure to the world of technology, and improving their computer competencies which make students to submit their activities easily, which has a positive effect on the level of achievement.

Considering the students' knowledge score before and after test regard postpartum care, the result of the present study showed that, highly significant differences between the two groups (control and experimental) in the average knowledge scores before and after the test with regard to postpartum physiological and psychological adjustment, minor postpartum discomfort, postpartum assessment, postpartum complications, and postpartum nursing care, p=0.000.

These findings were consistent with the study demonstrating the establishment of an extracurricular educational program in a Chinese context and evaluation of its effectiveness in self-learning for undergraduate nursing students by *Ying et-al, (2015)*. They implemented pre- and post-test to assess the effectiveness of this educational program using the Self-Learning Scale for Bachelor of Nursing and reported that post-test scores showed improvement compared to the pre-test scores of the study group that were higher than the control group after 18 months of training.

The researchers believed that these results may be due to the activities that were conducted during the flipped classroom session, where the students were divided into small groups, and each group consisted of a limited number of students, and the classroom was also modified to accommodate a small group sitting around the tables. Each session began with a fifteen-minute pre-test. Then, the students summarize the main points about the concepts they have learned in the videos. All of these activities motivate students to study hard and raise the level of knowledge retention more than traditional class-based lectures. A large number of students may interfere with focus and interest. In addition to repeating the questions makes the student about background with model answers.

Hew and LO, (2018) study in Hong Kong who found that overall, the data reported in their study indicate that more students favored the flipped classroom approach over traditional classroom. In addition, the flipped classroom approach was more effective than traditional classroom in increasing student learning performance. In the same line the study carried out by *Zhu et al., (2019)* demonstrated that, the results of the post-test questionnaire of "health

education knowledge", found a statistically very significant increase in students' achievement.

In the same line current study comparison between the two groups, in relation to student's satisfactory examination scores after implementation of two teaching approach, the findings showed that there are highly statistically significant differences between the two groups (control and experimental) in the average scores between students in the mid-semester and final exam in various question topics such as psychological adjustment after childbirth, minor postpartum discomfort, postpartum evaluation, and postpartum assessment, postpartum nursing care, health teaching after delivery, postpartum complications and their treatment, and neonatal care, and p = .001.

The study findings by, *Zhai et al., (2017*) illustrated that, teaching the knowledge to teach "health education" through the flipped classroom approach has a more positive effect on the students' success. Several reasons could explain this increase in students' level of mastery of knowledge by flipped classroom. Among others, the use of the questionnaire (pre-test) at the beginning of the course might have helped students to remember the knowledge acquired before the course.

Our results are inconsistent with other research, *Chen, (2016)* and *Zainuddin et al., (2019)* which has found no significant difference in students' outcomes between teaching by flipped classroom and traditional approaches. While *Clark (2015)* recognized that a novelty effect could lead to short-term improvements in students' performance when new technologies were introduced. In addition, this result is consistent with recently published meta-analyses, such as *AlJaser, (2017)*in his study investigated the effects of flipped learning and its effectiveness for increasing academic achievement among lower or average performing students than higher-performing students.

Regarding postpartum care procedures checklist, the findings indicated discrepancies between the average scores of the checklist of procedures performance in both groups with no statistically significant differences as the majority of students in control and experimental groups have satisfactory level in preparation steps, procedures steps and post-procedures.

The researchers found that there are no differences between the students' application of the practical skills steps in the skills lab. However the differences are only in the stability and confidence of the students in performance. Which need further study to measure those differences, representation and action by the students themselves to imitate the steps of the procedures in that no more analytical thinking is required and just doing the same steps so that there are no differences in the majority of procedures especially with newborn care, in general students in the Fillip class groups were more confident in all procedures.

These findings are in line with those of *Gross et al., (2015)* who showed that the flipped classroom had the greatest effect on the theoretical performance of low achievers in a biochemistry course. Another study showed a long-term

effect of flipped classroom on the performance of low achievers after testing students in a subsequent course *(Day, 2018)*.

The current study finding is in consistent with *Fakari et al., (2015)* conducted a clinical trial study to compare the effect of traditional, web-, and simulation-based education on the clinical competence of midwifery students in postpartum hemorrhage management in Mashhad. The results showed that clinical competence of students was significantly increased 1 week after education in all three groups, but the results of intergroup comparison showed no significant difference in clinical competence 1 week after intervention in the three groups.

In the same line the current study revealed that there are no statistically significant differences between the average scores of clinical assessment performance in both groups with regard to the application of postpartum care, whether in the hospital or in the skills lab, p > 0.05. The researcher also related these results regarding the clinical practices also interfere with the student's performance may be with positive or with negative.

With regard to the level of student satisfaction with the teaching methods used, the results of the current study showed that there are statistically significant differences towards the experimental group with respect to all items and sub-items of the scale of satisfaction with the flipped learning approach compared to the traditional learning methods at one hundred percent. The questionnaire results revealed that the majority of students in the EG agreed or strongly agreed on the efficiency of the flipped classroom on improving their learning and their interests in the course.

Compared with the didactic lecture format, students perceived the flipped classroom method to be more satisfying, interesting, and capable of improving their grade and learning. The study group showed complete satisfaction with the use of web technologies in teaching compared to four-fifths of the students of the traditional group. The researchers theorized that as giving time before class makes the student more involved in research and research in relation to particular subjects.

The results of the current study are consistent with the results of several previous studies according to *Carrick et al., (2017)*, *Gopalan et al., (2018)* and *Hew and Lo(2018)*the filliped class more positive than traditional effects regarding students' use of web skills. Moreover, the results of student satisfaction in the current study showed that the majority of students among the filliped classes reported being satisfied with the examples used and participation in teaching methods regarding postpartum care from the teacher and their peers compared to only two fifth of the traditional students.

CONCLUSION

In the light of the main study findings, it can be concluded that, the impact of the flipped classroom in increasing satisfactory level of knowledge regarding post-partum topics in terms of examination or assessment results and in contrast with clinical practices it was the same result of performance in term of demonstrations clinical procedures and

application of care in hospital clinical skills. So based on the results of the current study the researchers will accept the hypothesis of "The flipped classroom teaching approach will improve the maternal and newborn health nursing students' achievement in the theoretical part of postpartum care topic than the traditional method of teaching. And reject the hypothesis of 'Maternal and newborn health nursing students who will be taught postpartum care by flipped classroom approach will have a positive satisfaction toward the teaching strategy than those who will be taught by the traditional method).

And it was clear that the majority of filliped teaching group were satisfied and strongly agreed with all survey point and sub points more than students in traditional group. So, the researchers will accept the hypothesis of "Maternal and newborn health nursing students who will be taught postpartum care by flipped classroom approach will have a positive satisfaction toward the teaching strategy than those who will be taught by the traditional method.

RECOMMENDATIONS

Based on the results of this study, the following recommendations were suggested**:**
-   Replicating this study in another nursing and medical courses.
-   Using a mixed method paradigm and a larger sample size together with experienced/trained flipped classroom instructors.
-   Longitudinal studies should also be conducted to examine whether the flipped classroom approach can foster learning retention over a long period of time

REFERENCES

[1]. **Afzal M, Saeed T, Gilani S, (2019):** Perception of Nursing Students Regarding Blended Learning Implementation at University of Lahore, Pakistan 261654492018090102001.

[2]. **AlJaser, A. M. (2017):** Effectiveness of using flipped classroom strategy in academic achievement and self-efficacy among education students of princess Nourah bint Abdulrahman University. English Language Teaching, 19(4), 67-77.

[3]. **Asarta, C. J., & Schmidt, J. R. (2017):** Comparing student performance in blended and traditional courses: Does prior academic achievement matter? The Internet and Higher Education, 32, 29–38. https:// doi. org/10.1016/j.iheduc.2016.08.0 02

[4]. **Betihavas V, Bridgman H, Kornhaber R, and Cross M (2016):** The evidence for 'fipping out': a systematic review of the fipped classroom in nursing education. Nurse Educ Today;38:15–21.

[5]. **Carrick FR, Abdulrahman M, Hankir A, Zayaruzny M, Najem K, Lungchukiet P, et al.(2017):** Randomized controlled study of a remote flipped classroom neuro-otology curriculum. Front Neurol ;8:349.

[6]. **Chen, F., Lui, A. M., & Martinelli, S. M. (2017):** A systematic review of the effectiveness of flipped classrooms in medical education. Medical Educatio; 51(6), 585–597. https://onlinelibrary.wiley.com/doi/10.1111/medu.13272.

[7]. **Chen, L. L. (2016):** Impacts of flipped classroom in high school health education. Journal of Educational Technology Systems, 44(4), 411-420.

[8]. **Chuang LC, (2018):** Using fipped teaching to improve the learning outcome for anatomy and physiology courses of nursing students at junior college. J Teach Pract Pedagogical Innov;1(2):1–38.avalable at https://doi.org/10.3966/261654492018090102001

[9]. **Clark K R, (2015):** The Effects of the Flipped Model of Instruction on Student Engagement and Performance in the Secondary Mathematics Classroom. Journal of Educators Online; 12(1). DOI:10.9743/JEO.2015.1.5

[10]. **Day LJ, (2018):** A gross anatomy flipped classroom effects performance, retention, and higher-level thinking in lower performing students. Anat Sci Educ;11 (6):565–74.

[11]. **Doaa, M., Kamilia, R., Ahmed, R., & Randa, M. (2018):** Mother's Personal Care during Post Partum Period. Egyptian Journal of Health Care, 9(2), 48-60.

[12]. **Fakari FR, Kordi M, Mazloom SR, Khadivzadeh T, Tara M, Akhlaghi F (2015):** Comparing the effect of traditional, web based and simulation training on midwifery students' clinical competence in postpartum hemorrhage management. J Mazandaran Univ Med Sci; 25:65-77.

[13]. **Fan J, Tseng Y, Chao L, Chen S and Jane S (2020):** Learning outcomes of a flipped classroom teaching approach in an adult-health nursing course: a quasi-experimental study. BMC Medical Education; 20:317:2-11.

[14]. **Gopalan C, and Klann MC (2017):** The effect of flipped teaching combined with modified team-based learning on student performance in physiology. Adv Physiol Educ 2017;41:36 -7.

[15]. **Gross D, Pietri ES, Anderson G, Moyano-Camihort K,and Graham MJ, (2015):** Increased preclass preparation underlies student outcome improvement in the flipped classroom. CBE Life Sci Educ;14(4):ar36.

[16]. **Hassona F M ,. Ali A Z , Nageeb Sh M, (2019):** Nursing Students' Computer Self-Efficacy and Attitudes toward Its Use in The Health Care Setting: A Comparative Study. Evidence-Based Nursing Research Vol. 1 No. 4:1-9.

[17]. **Herath, D., & Mathotaarachchi, Y. (2018):** Information technology competency of registered nurse undergraduates at the completion of IT preparatory course in a bachelor nursing degree at a selected private university in Sri Lanka. National Information Technology.

[18]. **Hew K F, and LO C K, (2018):** Flipped classroom improves student learning in health professions education: a meta-analysis. BMC Medical Education; 18:38.

[19]. **Kintu M , Zhu C and Kagambe E (2017):** Blended learning effectiveness: the relationship between student characteristics, design features and outcomes. International Journal of Educational Technology in Higher Education;14:7:2-20.

[20]. **Lee, M. K., & Park, B. K. (2018):** Effects of flipped learning using online materials in a surgical nursing practicum: A pilot stratified group-randomized trial. Health Informatics Research, 24(1), 69-78. https://doi.org/10.4258/hir.2018.24.1.69.

[21]. **MacKinnon K, Marcellus L, Rivers J, Gordon C, Ryan M,and Butcher D (2017):** Student and educator experiences of maternal-child simulation-based learning: a systematic review of qualitative evidence. JBI Database System Rev Implement Rep;15(11):2666–706.

[22]. **Mohammad, H.N., & Khaleel, M.A. (2019).** Assessment of Nurse Midwives Knowledge Regarding Nursing Care of Post-partum Hemorrhage at Al-Najaf AL-Ashraf City Hospitals. Indian Journal of Public Health Research & Development, 10(10), 2953-2956.

[23]. **Oliver R, and Luther L (2020):** Flipping the graduate nursing classroom: an integrative review. J Nurs Educ ;59(6):305–10.

Park EO and Park JH (2018): Quasi experimental study on the efectiveness of a fipped classroom for teaching adult health nursing. Jpn J Nurs Sci ;15:125–34. https://doi.org/10.1111/jjns.12176.

[24]. **Ramnanan CJ, Pound LD (2017):** Advances in medical education and practice: student perceptions of the flipped classroom. Adv Med Educ Pract. 2017;8:63–73.

[25]. **World Health Organization, WHO (2017):** Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division.

[26]. **Yilmaz, R. (2017):** Exploring the role of e-learning readiness on student satisfaction and motivation in flipped classroom. Computers in Human Behavior, 70, 251-260.

[27]. **Ying T, Liping L, Qunyanxu, Anli J, (2015):** Development of a nursing education program for improving chinese undergraduates self-learning: Amixed-method study, nurse education today.

[28]. **Zainuddin Z, Haruna H, Li X., Zhang Y & Chu S. K. W. (2019):** A systematic review of flipped classroom empirical evidence from different fields: what are the gaps and future trends?. On the Horizon.

[29]. **Zhai, X., Gu, J., Liu, H., Liang, J. C., & Tsai, C. C. (2017):** An experiential learning perspective on students' satisfaction model in a flipped classroom context. Journal of Educational Technology & Society, 20(1), 198-210.

[30]. **Zhu, L, Lian, Z., & Engström, M. (2019):** Use of a flipped classroom in ophthalmology courses for nursing, dental and medical students: A quasi experimental study using a mixed-methods approach. Nurse Education Today, 104262. doi:10.1016/j.nedt.2019.104262.