

▪ **Basic Research**

**Satisfaction of Pediatric Nursing Students about e-learning
Compared to Face-to-Face Education during Covid-19
Pandemic**

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Abstract:

Background: The pandemic surely provided a significant challenge to global education systems and has imposed so many limitations on every aspect of life, so how can education be spared from it? **Aim:** To investigate and compare pediatric nursing students' satisfaction about face-to-face and e-learning education throughout the Covid-19 epidemic. **Research design:** descriptive cross-sectional study design **Setting:** The research was carried out in the faculty of nursing affiliated to modern information & Technology University. **Subjects:** A convenience sample of 160 pediatric nursing students was included in the study. **Tools:** electronic questionnaires with four components were used to collect data. (1) Nursing students' sociodemographic characteristics, (2) students' satisfaction with e-learning (3) students' satisfaction face-to-face learning (4) Compare the student academic achievement **Fieldwork:** started on October 2020 about 3 months to January 2021. **Results:** the rate of satisfaction was less than three-quarters of students had a moderate satisfaction level regarding e-learning education compared to less than half had a moderate satisfaction level regarding face-to-face learning education. **Conclusion:** This study found that e-learning is an excellent means of educating nursing students, but it is not a substitute for face-to-face instruction. The two methods of education complement each other. E-learning to teach clinical skills is most effective when integrates with traditional classes. This study focuses insight on the obstacles and factors influencing pediatric nursing students' satisfaction of e-learning education throughout COVID-19 19 pandemic as a recently adopted teaching approach. **Recommendations:** It will help to develop an effective plan for the successful deployment of e-learning and will see new technology as a positive step toward growth and evolution.

Keywords: COVID-19 Pandemic, E-learning, Face to face learning, Pediatric Nursing, Satisfaction.

Introduction

Since about August 2020, the new coronavirus disease 2019 (COVID-19) epidemic has been declared a public health emergency, infecting over 24 million people and killing over 825,000 people globally (**WHO, 2020**). COVID-19 has touched almost one billion students, according to the United Nations Educational, Scientific, and Cultural Organization (UNESCO) (80 percent of all students globally). (**UNESCO, 2020**).

Technology has had a significant impact on the world, and everything is progressing at its own pace. However, since the arbitrary lockout, the educational emphasis has shifted. Almost every educational institution in the world has developed innovative ways to communicate with students. However, from a practical standpoint, where clinical experience is the lifeblood of pediatric nursing students, it may be beneficial for theoretical purposes. Meanwhile, given the current situation, online program are serving as a supplement. (**World Economic Forum. 2020**).

During COVID-19, e-learning devices played a critical role in assisting schools and colleges in making studying simpler during the lockdown of schools and institutions. While adjusting to the new changes, students and staff should be helped in their readiness for this new teaching style. In addition, blended learning (BL), which combines face-to-face and online learning, is becoming more popular in higher education. Some researchers call it the "new standard" or "new paradigm" in course delivery. (**Subedi, et al 2020**).

Students and educational institutions around the world have recognized and favored e-learning methods of teaching for a variety of reasons, including learning flexibility, the convenience of access, and a controlled learning environment. Online learning, on the other hand, has a number of drawbacks, including network challenges, a lack of social connection, and a lack of communication skills; it also necessitates time management and self-motivation abilities (**Sá & Serpa, 2020**). Online learning is not a common teaching approach in educational institutions. In COVID-19, however, most academic foundations used e-learning to help students study better. (**Mahajan, 2018**).

Nursing students, who are essential components of the nursing education system, should have the necessary qualifications to meet the system's requirements. During the COVID-19 pandemic, it is vital to identify nursing students' satisfaction with online education, as well as the variables that

influence this satisfaction, and to put in place the necessary guidelines to increase favorable views. Students' and teachers' satisfaction is one of the "five quality pillars" in the e-learning consortium's quality framework and is thus highly predictive of the quality and success of online courses. Students and teachers' and teachers' and teachers' satisfaction with e-learning education should be looked into, as well as the factors that affect it. This could help improve the results of online education. (Alqurashi, E. 2019).

Significance of the Study:

A serious difficulty occurred when teachers were expected to digitalize the curriculum and learning activities while maintaining the quality of the learning experience for the students. Due to the epidemic, education providers have been forced to undertake teaching and learning online. Teachers and lecturers were required to teach in front of a computer or laptop, which increased students' reliance on their phones. How should academics look into students' happiness with e-learning and face-to-face education in the midst of the COVID-19 outbreak, and how should they do this?

The Egyptian Ministry of Higher Education has recognized the need for e-learning integration in universities, in addition to making the learning process easier for students. As a consequence, the purpose of this study was to see how satisfied pediatric nursing students were with the effectiveness of e-learning instruction during the COVID-19 pandemic compared to face-to-face teaching. In addition, the findings of this study could help make e-learning more successful in the years to come.

Aim of the study

The current study aimed to assess the satisfaction of pediatric nursing students about e-learning education in comparison to face-to-face during the COVID-19 pandemic.

Research hypotheses:

- 1- How do students perceive the effectiveness of e-learning education in comparison with face-to-face learning during the COVID-19 pandemic?
- 2- How do students' academic achievement of e-learning & face-to-face education ?

3- What are the challenges facing pediatric nursing students while using e-learning methods of education ?

Materials and Method **Research Design:** This study was a cross-sectional descriptive study.

Setting: This study was conducted at the Faculty of Nursing Modern Information & Technology University

Subjects: All 160 students in the third year of pediatric nursing at the previous institution were included in the study. They had to meet the following criteria to be included:

- Enrolled in the third year (academic year 2020–2021).
- willing to take part in the research
- Implemented the Modern University System in e-learning

Tools of data collection:

The researcher designed a computerized questionnaire after examining the literature based on

M. Bczek (2021) to achieve the study's goals and answer the research questions. The questionnaire consists of four parts:

Part one: Students were asked to input their personal information (age, sex, residence) and explain their IT abilities, as well as if they had previously participated in any online courses and whether they had access to the internet at home.

Part two: To investigate the students' knowledge regarding benefits of e-learning education, it consists of 8 questions such as (are e-learning technology effective to the success of the educational process, are uses of e-learning methods of education need special level of skills, are e-learning methods suitable for the students wishing to learn regardless of their age or level of education, are need special skills of information & technology to use e-learning methods....etc).

In addition, there was another 5 questions regarding practices of e-learning such as (are you preferred the college's official website to follow up the content & materials if e-learning methods of education allow to direct contact with the subject professor.....etc).

Part three: This part included **10** questions dealt with satisfaction with e-learning & face-to-face education such as (Are you satisfied with the online lessons offered during the corona crisis, are you interact probably with online lessons during the corona crisis, do you need assistance from faculty while following lectures on the internet, are you enjoyed from the experience of e-learning methods of education, are you feel comfortable in distance learning because its suitable methods of learning at own pace and according to your abilities....etc).

Part four: This part included **7** questions required responders to compare between e-learning and face-to-face education such as (blended education between online teaching and face to face better than the traditional methods, are you can solve exercises and questions faster through e-learning or face to face learning, e-learning methods of teaching allow to direct contact with the your colleague better than face to face methods.....etc).

Scoring system:

Each item of the questionnaire was rated on three point Likert scale, where 1 = Agree 2=To some extent 3=Disagree, the maximum score was 21 and the minimum was 7 score.

Totally the maximum score was 90 score, and the minimum was 30 score. The total score was converted to 100% and then categorized as following:

- less than 60% was considered low level satisfaction
- 60% to less than 75 % was considered as moderate level of satisfaction
- More than 75% was considered as high level of satisfaction.

Methodology:

A formal letter from the dean of the Faculty of Nursing would be sent to Modern University's department of learning and students' affairs to inform them of the purpose of the study and to obtain their clearance to conduct the research in the specified department.

2. Google Forms were used to create an online structured questionnaire. The link to the survey was sent to the students through university emails, Facebook, and WhatsApp, as well as other channel.
3. Five nursing specialists confirmed the validity of the data-gathering instruments. The changes were made in accordance with their suggestions..
4. Reliability of the data collection tool was tested utilizing Cronbach's alpha coefficient test ($\alpha = 0.85$) which indicates a high degree of reliability.
5. A pilot study was done on 10% of the subjects (16 students) to ensure clarity, applicability, and comprehension of the study tool and to detect the obstacles that might impede the data collection process. No modification was done, so the participants in pilot study were included in the study subjects
6. The researchers met with the students and described the purpose and nature of the study over the course of three months, from October 2020 to January 2021. The researchers shared the questionnaire link with the participants via university emails, Facebook, and WhatsApp.

Ethical considerations:

The research proposal was approved by MTI University's Faculty of Nursing's Research Ethics Committee. The competent authorities gave their official approval for the study to be carried out. All students expressed their agreement to participate in the study either orally. They were informed of the study's purpose as well as their right to decline or withdraw at any time without cause. The data was kept private. Students may not experience any negative effects as a result of the study methods.

Statistical analysis:

SPSS 26 statistical software was used for data entry and statistical analysis. The Cronbach alpha coefficient was derived to evaluate the tool's dependability based on its internal consistency. Because participants were urged to properly fill out the form, there were no missing data, and we obtained a complete datasheet. As indicated earlier, the received data were analyzed using descriptive and inferential statistics with statistical product and service solutions (SPSS version 26) following our study purpose. For univariate analysis, categorical variables were represented as frequencies and percentages, while continuous variables

were represented as means and standard deviations. Bivariate analysis was performed using the chi-square test and the paired t-test. These tests were used to determine the relationship and difference between independent and dependent variables. For the tests in question, the statistical significance (p-value) was fixed at 0.05.

Results:

Figure (1) Distribution of Sociodemographic of Pediatric Nursing Students. N=160

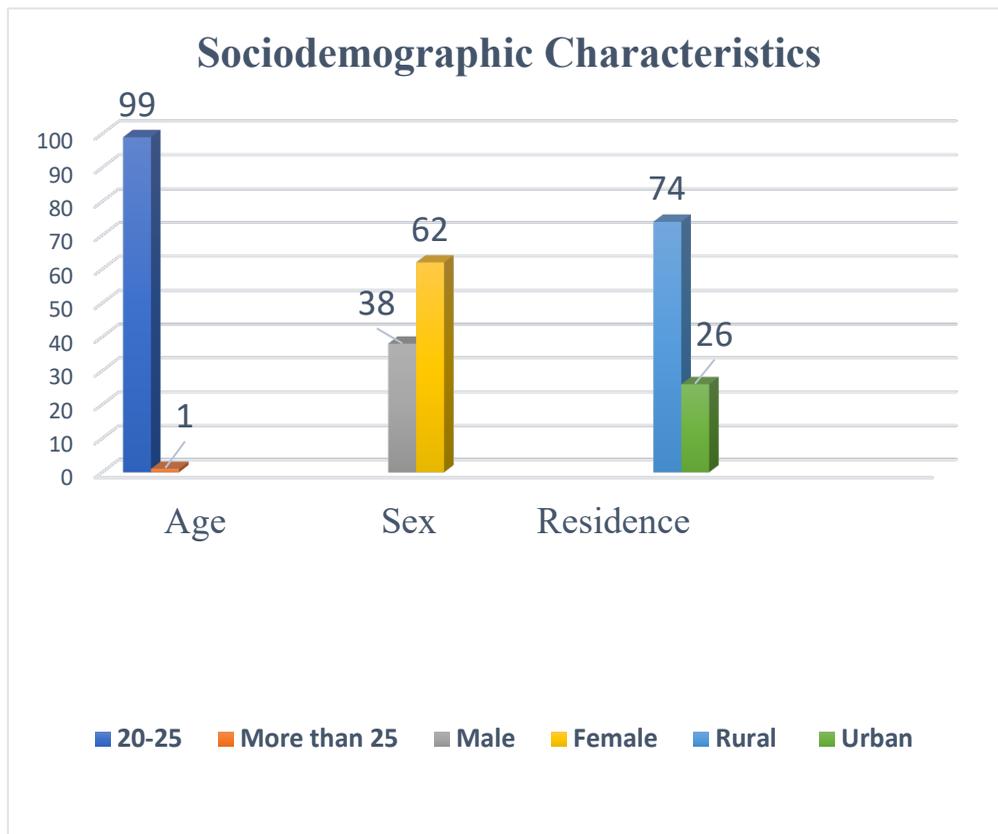


Figure (1): reveals that the mean age of students was 21.48 ± 1.52 years and less than two-thirds (62%) of them were females. In addition, slightly less than three quarters (74%) of students were from rural areas.

Figure (2) Distribution of Students' Experience regarding E-learning Compared to Face-to-Face Learning

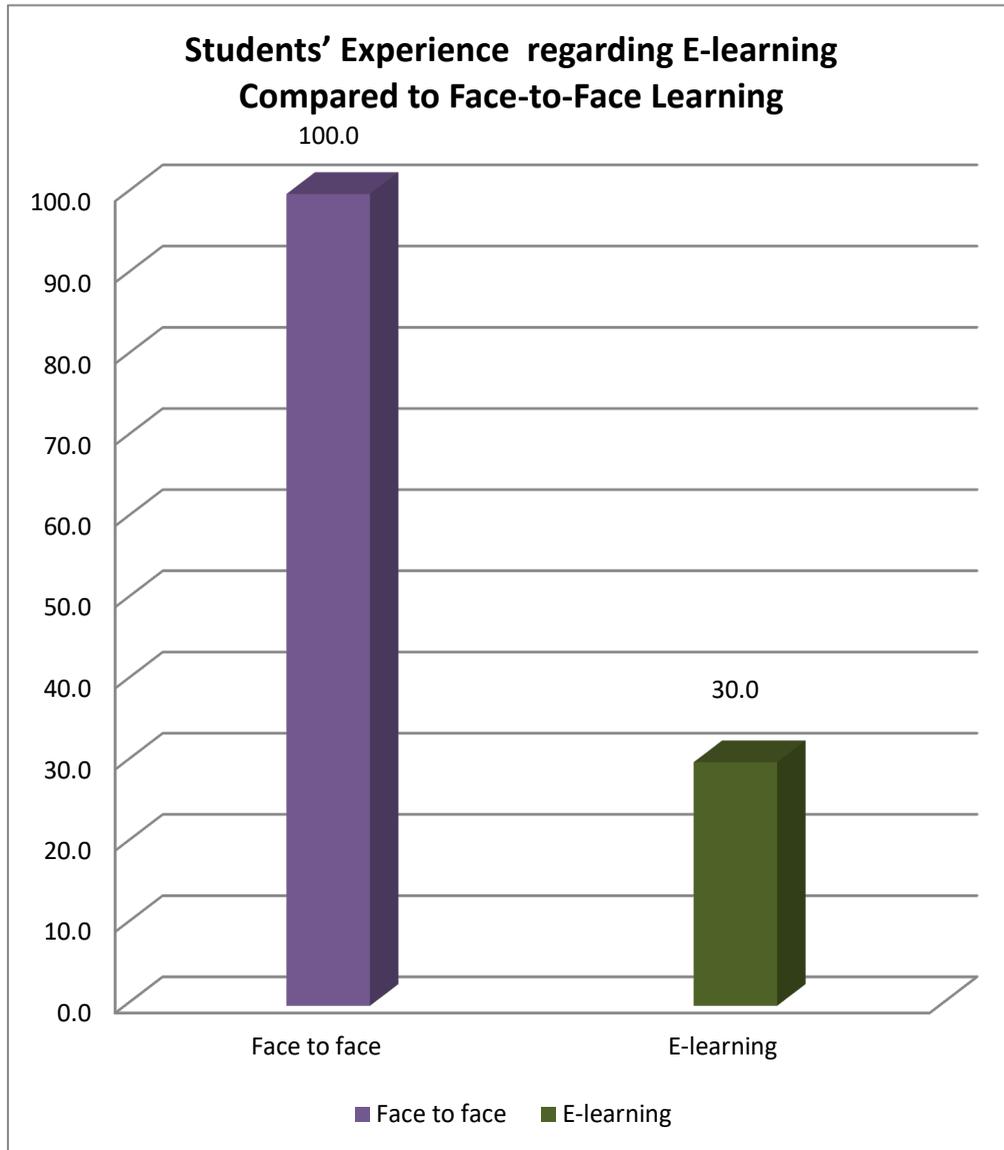


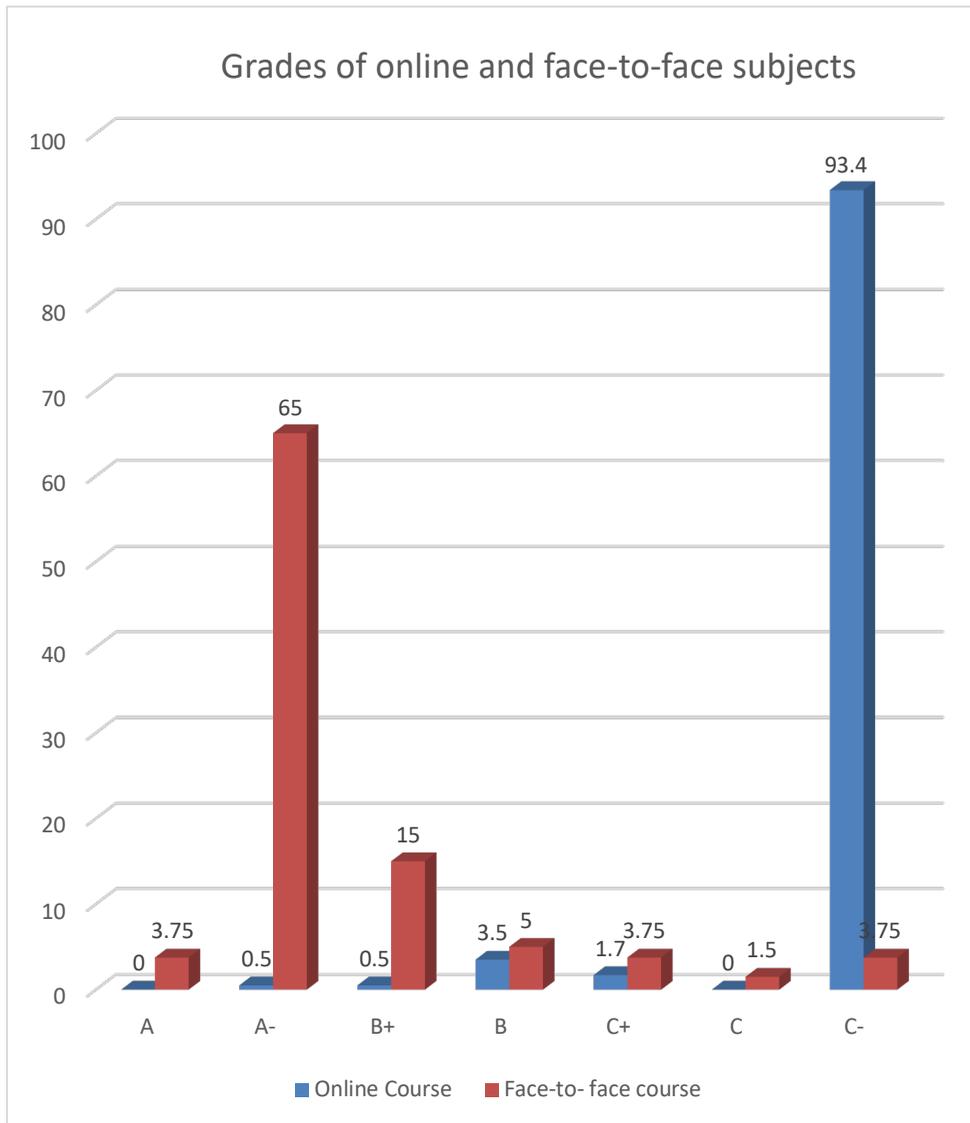
Figure (2) Clarifies that all students (100%) had experience with face-to-face learning compared with nearly one third (30.0 %) had experience with e-learning.

Table (1): Distribution of Factors Enhanced e-learning as illustrated by Pediatric Nursing Students (N=160)

Items	N	%
Skill level for E-learning		
Advanced	112	70.0
Moderate	44	27.5
Depend on experience	4	2.5
Methods for E-learning		
Moodle electronic system	68	42.5
Direct contact to the lecturer	60	37.5
Video conference	26	16.3
Soft books, videos, and CDs	6	3.8
Appropriateness for E-Learning		
Excellent	70	43.8
Good	42	26.3
Accepted and needs more development	48	30
The capability of university students to transform into E-learning		
Agree	144	90
Some have difficulties	16	10
Impression regarding E-learning system at MTI		
Positive	102	63.8
Neutral	48	30
Negative	10	6.3
Technical difficulties of using E-learning methods		
Internet service	68	42.5
Faculty site problems	56	35.0
Errors during downloading lectures	32	20
Has not laptop	4	2.5

Table (1): Explains that 90% and 70% of studied students illustrates that the capability of university students to transform into E-learning and need advanced skill level for e- learning respectively. This table also shows that less than half (42.5% and 43.8%) of students used the model electronic system as an effective method and showed e-learning is excellent method for teaching respectively.

Figure (3) Distribution Student's Grades with E-learning Compared to Face-to-Face Teaching



Figures (3): Reveals that the majority (93.4%) of students had C grades with E-learning Compared to two-thirds (65%) of them had A grades with face- to face learning.

Figure (4) Distribution of Satisfaction Levels of Pediatric Nursing Students Regarding E-learning Compared to Face-to-Face Learning

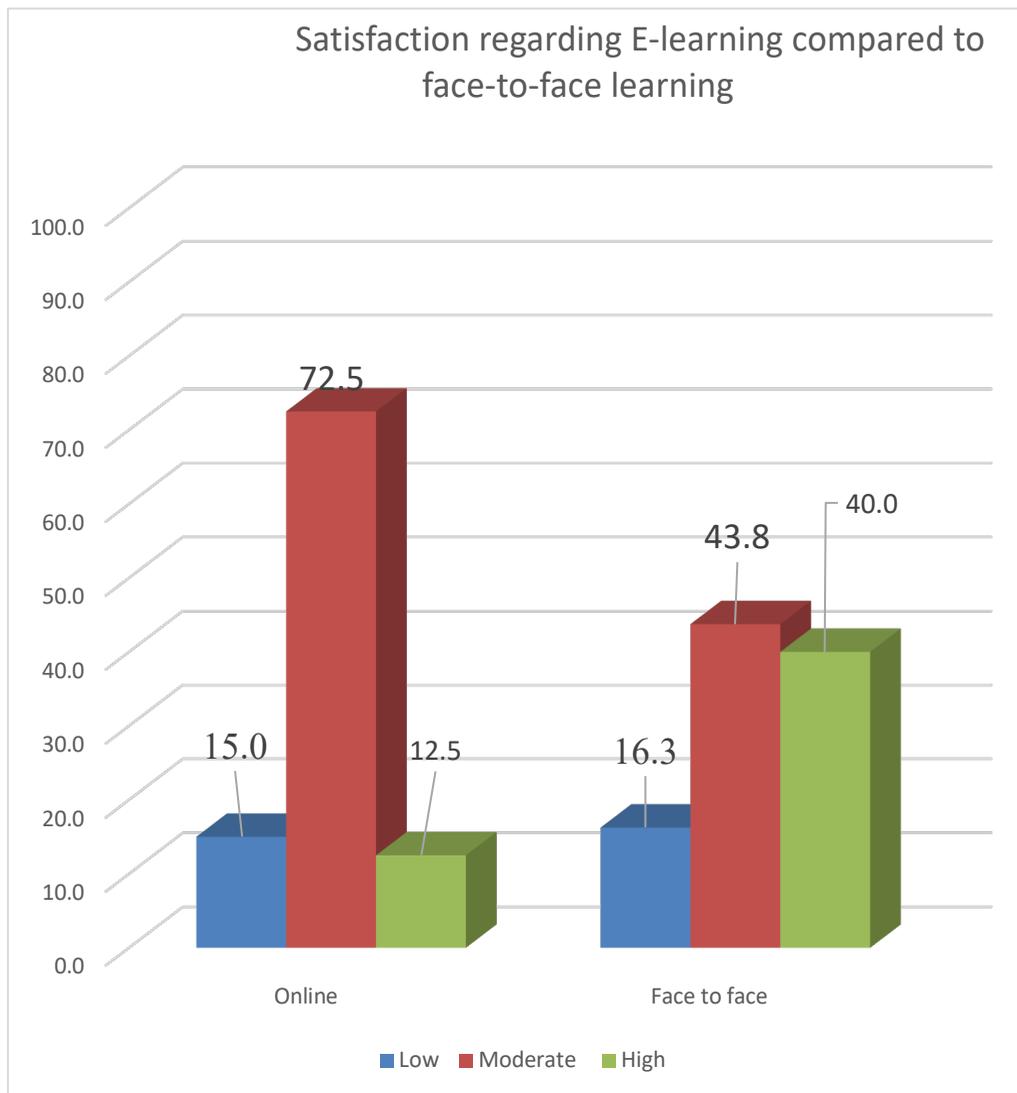


Figure (4) Denotes that less than three quarters (72.5%) of students had moderate satisfaction regarding e-learning compared to less than half (43.8%) regarding face-to-face learning. This figure also shows that 12.5% of students had high satisfaction regarding e-learning compared two-fifths (40%) regarding face-to-face learning.

Table (2) Relationship between Students' Sociodemographic Characteristics and their Satisfaction Regarding Face-to-Face teaching

Items	Satisfaction regarding face to face						X ²	P value	Sig.
	Low		Moderate		High				
	N	%	N	%	N	%			
Age									
20 -25	24	92.3	70	100	64	100	10.43	0.005*	S.
More than 25	2	7.7	0	0	0	0			
Sex									
Male	17	65.4	43	61.4	40	62.5	0.12	0.93	N.S
Female	9	34.6	27	38.6	24	37.5			
Residence									
Rural	17	65.4	53	75.7	48	75	1.13	0.56	N.S
Urban	9	34.6	17	24.3	16	25			

Table (2): This table presents that there was a statistically significant relationship between sociodemographic characteristics of students and their satisfaction regarding face-to-face learning ($x^2= 10.43$, $P= 0.005^{**}$). Where, this table shows that 100% of students in age group between 20 to 25 years had moderate and high satisfaction respectively. Meanwhile 65.4% of students from rural area had low satisfaction of face-to-face teaching.

Table (3) Relationship between Students' Sociodemographic Characteristics and their Satisfaction Regarding E-learning

Items	Satisfaction regarding E-learning						X ²	P value	Sig.
	Low		Moderate		High				
	N	%	N	%	N	%			
Age									
20 -25	22	91.7	116	100	20	100	11.47	0.003**	S.
More than 25	2	8.3	0	0	0	0			
Sex									
Male	7	29.2	49	42.2	4	20	4.43	0.10	N.S
Female	17	70.8	67	57.8	16	80			
Residence									
Rural	15	62.5	89	76.7	14	70	2.24	0.32	N.S
Urban	9	37.5	27	23.3	6	30			

Table (3): This table presents that there was a statistically significant relationship between sociodemographic characteristics of students and their satisfaction regarding E- learning ($x^2= 11.47$, $P= 0.003^{**}$). Where, this table shows that 100% of students in age group between 20 to 25 years had moderate and high satisfaction respectively. Meanwhile 70.0% of students from rural area had high satisfaction of E-learning.

Table (4) Mean of Pediatric Nursing Students' Satisfaction Regarding E-learning and Face to Face Teaching

Items	Mean \pm SD	T -test	P-value	Sig.
Satisfaction Level regarding face to face and E-learning				
Satisfaction (E-learning)	27.76 \pm 4.83	4.14	0.000**	H.S
Satisfaction (face to face)	30.80 \pm 8.31			

Table (4): This table shows that there was a highly statistically significant difference between e-learning and face-to-face teaching, where the mean score of students' satisfaction regarding e-learning is 27.76 ± 4.83 compared with 30.80 ± 8.31 for face-to-face teaching.

Table (5) Relationship between Student' Satisfaction and their Grades

Grades' items	Satisfaction regarding face to face						X ²	P-value	Sig.
	Low		Moderate		High				
	N	%	N	%	N	%			
Face to face subject							9.84	0.63	N.S
A	1	3.8	2	2.9	1	1.6			
A-	18	69.2	53	75.7	50	78.1			
B+	4	15.4	10	14.3	5	7.8			
B	1	3.8	3	4.3	2	3.1			
C+	1	3.8	3	4.3	2	3.1			
C	1	3.8	1	1.4	0	0			
C-	0	0	1	1.4	3	4.7			
Grades' items	Satisfaction regarding e-Learning						X ²	P-value	Sig.
	Low		Moderate		High				
	N	%	N	%	N	%			
E-Learning							14.8	0.06	N.S
A	0	0	0	0	0	0			
A-	0	0	0	0	1	5			
B+	0	0	1	0.9	0	0			
B	0	0	2	1.7	2	10			
C+	0	0	2	1.7	1	5			
C	0	0	0	0	0	0			
C-	24	100	111	95.7	16	80			

Table (5): This table clarifies that there was no statistically significant relationship between students' satisfaction about face to face and e- learning and their grades, where X² was 9.84 and 14.8 (P, 0.63 &0.06) respectively.

.01**).

Discussion

The global expansion of the coronavirus has imposed so many restrictions on all aspects of life, how can education be exempt? But, because human nature is inherently curious and inventive, nothing can stop it from continuing on its

journey. This pandemic has impeded schooling, but it has taught the globe about many facets of experimentation.

Egypt encountered challenges in transitioning from a traditional education system to one based on e-learning. Converting traditional courses to electronic courses was a distinct and serious task (**Abozeid A, et al. 2021**). The success of e-learning at educational institutions is influenced by a number of factors. As a result, adopting e-learning means that it needs to be constantly checked to make sure it works and that students are happy with it. (**Al-Fraihat, et al., 2020**). So, the present study aimed to investigate satisfaction level of the pediatric nursing students towards e-learning in comparison to face to face teaching during the COVID-19 pandemic.

Concerning the socio-demographic characteristics of the pediatric nursing students, the finding of the present study illustrated that the mean age 21.48 ± 1.52 years, and slightly less than two-thirds of them were females. Additionally, more than three-quarters of the students were living in rural areas. These findings were similar to the study done by **Diab and Elgahsh (2020)** at Menoufia University to identify the e-learning obstacles faced by nursing students, they found that the mean age of more than three quarters of the students was 22.23 ± 2.02 years, and the majority was female and from rural area.

According to current data, slightly less than two-thirds of students agree with the availability of e-learning platform forms. Meanwhile, the remaining students were having difficulties using the e-learning platform form. This could be due to the fact that they live in rural settings, where internet access is more difficult than in urban areas. Furthermore, the current study's findings reveal that more than three-quarters of students do not have access to the internet at home, making it difficult for them to engage with lecturers and peers. Similar findings were obtained in **Rojabi's (2020)** study in Indonesia and **Zalat et al. 2021**'s in Zagazig, where the majority of the studied students agree on the smooth use of e-learning via university platform form. In addition, the current findings were contradicted to the study done in the Kingdom of Saudi Arabia by **Chokri (2012)** According to the researchers, the majority of the participants in the study disagreed about how easy e-learning is to use. This could be attributed to the respondents' lack of familiarity with the e-learning platform as well as their lack of technical skills and expertise, highlighting the necessity for ongoing training workshops on the use of various digital learning platforms to facilitate e-learning activities. Regarding the factors enhancing the use of e-learning by students, the current finding demonstrated that the vast majority of the students illustrates the capability of university

students to transform into e-learning and need advanced skill level for e-learning and also used the model of electronic system as an effective method and they showed e-learning is excellent method for teaching. This could be attributed to faculty facilities that the university offered to students as Microsoft team channels made the e-learning easier. This is congruent with the study done in Indonesia by **Amir. et al (2020)** who found that most of the studied sample experienced challenges during distance e-learning. However, in their opinion, e-learning is effective in terms of increasing their clinical and social skills and e-learning is effective when combined with traditional classes.

According to the current student satisfaction results, less than three-quarters of students were moderately satisfied with e-learning, compared to less than half with face-to-face learning. This finding is in same line with (**Osman et al.'s 2020**) findings, which show that e-learning improves students' satisfaction with the learning process. Several studies have been conducted to determine student satisfaction with the effectiveness of online learning and the challenges they face, with the results indicating that the majority of students enrolled in online learning are satisfied with this innovative strategy when compared to face-to-face instruction. Several elements, such as learning residence, sex, age, style, computer expertise, and skills, have been shown to influence learner satisfaction in research. (**Shrestha et al 2019; Salloum et al 2019, and Pérez- aérez, et al., 2020**).

According to the findings of this study, the mean level of satisfaction for e-learning was higher than for face-to-face learning, indicating that e-learning provides superior motivation to study and fast feedback. It is far too simple to learn everything using a computer. Despite the fact that face-to-face connection with instructors is better for the learning process, e-learning is better for addressing study problems and giving inefficient students more opportunities. On the other hand, internet satisfaction was higher than face-to-face satisfaction. According to the study, this could be related to early exposure and involvement with technology, as well as the fact that using smart gadgets for a lengthy period of time per day makes it easier to adapt and deal as much as possible. As shown from the finding of the current study regarding to student's academic achievement through e-learning, the current study demonstrated that no statistically significant relationship between students' satisfaction about face to face and e-learning and their grades (X^2 9.84 and 14.8 P, 0.63 & 0.06). This finding may be due to students' willingness and satisfaction with this innovative teaching strategy and with face-to-face teaching and both do not affect their achievement despite the finding of the current study emphasizing the students were preferred e-learning.

Similar findings were found in the study conducted in Indonesia by **Blake H, et al, 2021**). There have also been findings that e-learning has maintained medical students' motivations, attitudes, and other mental health characteristics, as well as their academic achievement. Unexpected benefits of the pandemic have also been found, like more creative ways to teach and a greater desire to learn. (**Sani I, et al, 2020**).

Conclusions:

E-learning is a valuable method of teaching for pediatric nursing students in comparison with face-to-face teaching, where most students are satisfied with e-learning. Meanwhile, face-to-face teaching was also preferred, and the two methods of learning completed each other. In addition, there were many factors enhancing e-learning, such as Microsoft team channels and the availability of internet access. Furthermore, there were some obstacles to demonstrating e-learning, such as the cost of internet access and slow speed, especially in rural areas.

Recommendations:

Based on the findings of this study, the following suggestions are made:

- Implementation of a number of student training sessions on how to use e-learning and solve technological problems.
- Workshops for instructors to assist them in solving the technical concerns of students
- The Ministry of Higher Education should figure out how to make internet access more affordable for university students.
- Future research should be undertaken with a large number of individuals and from other departments.

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الملخص العربي**رضا طلاب تمريض الاطفال عن التعليم الإلكتروني مقارنة بالتعليم وجهًا لوجه اثناء جائحة كورونا****مقدمة**

مما لا شك فيه ان جائحة كورونا اثارت تحديًا كبيرًا لأنظمة التعليم العالمية وفرض العديد من القيود على كل جانب من جوانب الحياة ، فكيف يمكن تجنب التعليم منه.

الهدف من البحث :

فحص ومقارنة رضا طلاب تمريض الأطفال لطرق التدريس بالتعلم الإلكتروني و التعليم وجهًا لوجه اثناء جائحة Covid-19.

تصميم البحث :

دراسة مقارنة وصفية

مكان الدراسة:

العينة البحثية تضمنت الدراسة عدد من 160 طالب وطالبة بكلية التمريض الفرقة الثالثة الجامعة الحديثة للتكنولوجيا والمعلومات قسم تمريض الأطفال استغرق البحث حوالي 3 أشهر في أكتوبر

2020 حتى يناير 2021

أدوات البحث: تم استخدام الاستبيانات الإلكترونية لجمع البيانات بعد الاطلاع على المراجع المختلفة ويشتمل على (1) الخصائص الديموجرافية لطلاب التمريض السن، النوع، محل الإقامة، الخبرة في استخدام التكنولوجيا ، (2) استمارة استبيان لقياس نسبة رضا الطلاب عن التعلم الإلكتروني والتعلم وجهًا لوجه (3) استمارة استبيان لمعرفة خيرات الطلاب عن التعلم الإلكتروني والتعلم وجهًا لوجه. (4) مقارنة فعالية التعلم وجهًا لوجه بالتعلم عبر الإنترنت من حيث إتقان أهداف التعلم (المعرفة والمهارات السريرية والكفاءات الاجتماعية) (5) مقارنة الإنجاز الأكاديمي للطلاب في عدد 2 مقرر واحد تم الدراسة بالتعليم الإلكتروني والثاني بالتعليم وجهًا لوجهة .

النتائج: وجد ان متوسط عمر الطلاب المشاركين بالبحث حوالي 20 سنة وجدت علاقة ذات دلالة احصائية بين سن الطلاب والخبرة في التعامل مع جهاز الحاسوب كان معدل الرضا أقل من ثلاثة أرباع الطلاب لديهم مستوى متوسط من الرضا فيما يتعلق بالتعلم الإلكتروني مقارنة بأقل من النصف لديهم مستوى رضى معتدل فيما يتعلق بالتعلم وجهًا لوجه.

الخلاصة: نستخلص من هذه الدراسة أن التعليم الإلكتروني وسيلة ممتازة لتعليم طلاب التمريض ، ولكنه ليس بديلاً عن التدريس وجهًا لوجه. الطريقتان في التدريس تكملان بعضهما البعض. يكون التعليم الإلكتروني لتعليم المهارات السريرية أكثر فاعلية عندما يتكامل مع الفصول التقليدية.

التوصيات : (1) تنفيذ عدة ورش تدريبية للطلاب حول كيفية التعامل مع التعلم الإلكتروني وحل المشكلات الفنية والعقبات التي تواجه الطلاب

(2) عقد ورش عمل تدريبية لأعضاء هيئة التدريس والهيئة المعاونة لتمكينهم من حل المشكلات الفنية التي تواجه الطلاب وذلك يساعد على وضع خطة فعالة للنشر الناجح للتعليم الإلكتروني وسيرى التكنولوجيا الجديدة كخطوة إيجابية نحو النمو والتطور لمنظومة التعليم .