Nursing students' perceptions of shifting to online learning due to (COVID-19): students' demographic correlates

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Abstract:
Background: The abrupt switch from traditional to online learning due to COVID-19 caused a variety of challenges. Investigating student learning perception or feedback should consider students' discrepancies, such as demographics.
Purpose: Assess the nursing students' perceptions toward shifting from traditional classrooms to online distance learning due to (COVID-19) with investigation of student demographic correlates.
Method: A comparative research design was used to answer the stated research questions (1) How did the nursing students perceive online learning compared to traditional classroom-based learning? (2) To what extent can the students' demographic characteristics affect their perception of the students? A purposive sample of 649 bachelor's nursing students was recruited from a selected faculty of nursing, divided into study and control groups. clinical and theory courses were chosen. A Students' Learning Perception Questionnaire (SLPQ) was the utilized tool to measure students' perceptions.
Result: A significant statistical difference was found between the study and control groups regarding the overall students' learning perception, as indicated by the SLPQ (p = 0.00). Also, students' perceptions are not affected by their demographic except for course type (0.045).
Conclusion: Students perceived online learning as more effective than traditional learning. Students' perception was not affected by the almost investigated students' demographic except the course type.
Key Word: Online learning; Traditional learning; Nursing students; Perception; COVID-19.

I.   Introduction

Nearly every element of life, including education, has undergone significant alteration due to the COVID-19 Pandemic's global spread. Egypt has not escaped these changes. The World Health Organization (WHO) proposed some requirements, including social and physical distance, which presented challenging implementation decisions for every nation. Other rules include allowing people to work from home and homeschooling Egyptian students who regularly learn through Traditional classroom learning (TCL) (WHO, 2020).

The Centers for Disease Control and Prevention (2020) state that in order to maintain students' academic progress throughout the COVID-19 pandemic, e-learning plans, including distance learning choices, have been put into place (COVID-19, CDC). United Nations Educational, Scientific and Cultural Organization (2020) notes that due to COVID-19, countries had to switch their educational systems to online distance learning (ODL), affecting millions of students worldwide, or roughly 67.7% of the total enrolled students from 144 country-wide closures (UNESCO, 2020).

Multiple countries reportedly developed various learning systems while physical schools were shuttered due to COVID-19 (World Bank,2020) . For instance, China adopted an online learning system in early February 2020 by organizing concurrent online learning activities to ensure that students' education remained uninterrupted. In order to avoid school closings in Egypt, 2.7 million academic students began learning at home in February 2020 using interactive apps, and other faculties received more useable asynchronous online learning tools (like reading materials via Google Classroom, ZOOM, sending lessons and assignments via the official website, WhatsApp, or email). (UNESCO, 2020).

Online distance learning places emphasis on synchronous and asynchronous Internet-based courses. Synchronous learning is a type of education that combines face-to-face interactions between students and teachers with internet tools like conferences and chats. On the other hand, asynchronous learning is a method of indirectly (not simultaneously) using an autonomous learning technique (Ko & Rossen, 2017; Ogbonna et al., 2019).

Students encountered numerous challenges during the ODL adoption in high school, particularly in clinical education, such as nursing education periods, particularly in Egypt, where they were suddenly required to apply ODL. The usage of facilities and the limited infrastructure available so far have been difficult with ODL applications. Schools are now required to use a learning flow that includes difficulties and constraints due to the shift from traditional direct instruction TCL to more indirect techniques (Rusmiati Aliyyah et al., 2020). together with the price of acquiring pricey data packages and a bad Internet network, especially in rural (Bakalar, 2018).

Assessment of students' perceptions concerning the offered learning methods has increased recently because getting feedback from undergraduates is the greatest way to verify the quality of academic instruction (Herrmann, Bager-Elsborg and Parpala, 2017). Perceptions are crucial for student retention, improving academic results, and assisting leaders in creating an appropriate improvement strategy (Mah & Ifenthaler, 2018). Students' opinions of their academic environment serve as a mediating factor for the impact of contextual factors. Therefore, educational initiatives won't be successful until they alter students' perceptions (Richardson, 2005).

Numerous research focused on a single facet of students' perception, such as self-efficacy, behavioral reaction, or affective response. In contrast, the researchers prefer to use comprehensive and multi-dimensional instruments for the current investigation. The current study employed students' approaches to learning (SAL) as an indicator of students' perception because the perception of the academic context of courses in remote education is closely correlated with SAL. Instead of the other way around, how students approach their academic environment affects how they approach learning (Richardson, 2005).

The way that students show their perception might be affected by students' demographical characteristics such as age, gender, and academic level. Since many previous studies assessed undergraduate students' perception, several studies have emphasized the need to examine the factors that may affect their perception, such as students' demographic (Dev & Qayyum, 2017). The students' demographic factors, such as age, gender, and academic standing, may have an impact on how they express their perceptions. Since much earlier research evaluated undergraduate students' perceptions of their given education, few studies have underlined the necessity to assess the variables that could influence their view, such as the demographics of the students (Dev & Qayyum, 2017). Therefore, the current study aimed to assess the nursing students' perception toward shifting from traditional classrooms to online distance learning due to COVID-19 social distancing measures and investigate the impact of students' demographics.

II. Material And Methods

Research design

Due to COVID-19 social distancing measures, nursing students suddenly shifted to learn theoretical and clinical courses by online distance instead of classroom learning. Hence a comparative research design was used in the current study to answer the following research questions.

1) How did the nursing students perceive online distance learning compared to traditional classroom-based learning?

2) To what extent can the students' demographic characteristics affect the perception of the students?

The selected participants were divided into the study and control groups. To carry out the study, two specific courses were selected—health assessment (a clinical course) and nursing research (a theoretical course). The same teachers taught the study and control groups' chosen courses. Compared to the control group of nursing students who (retrospectively) learned the identical courses through TCL learning as they usually do, the study group learned the selected courses (prospectively) via ODL. Both the research and control groups were evaluated on how they perceived the learning process in terms of how the students approached learning. Additionally, the relationship between the demographics of the students and their perceptions was investigated.

Setting and samples

The current study recruited a purposive sample of 649 male and female bachelor's degree nursing students who were enrolled in two specific courses: health assessment (clinical course) and research in nursing (theoretical course) at selected governmental faculty of nursing. The estimated sample size was calculated by (G Power analysis) (One tail, $\alpha = 0.05$, independent t-tests - Effect size = 0.5, balanced allocation ratio 1:1, Power $(1-\beta) = 0.95$). The following inclusion criteria were met by the students who were chosen for this study and who were enrolled in the chosen courses: None of the participants had previously taken the online course; they all had the same educational background, were enrolled full-time, and had completed all prerequisite courses.

Intervention

The study instruments' practicality, objectivity, and clarity were tested in a pilot study with 48 students. The researchers started collecting retrospective data for the control group by looking at the records of the

selected students enrolled in the chosen courses in the autumn of 2019. The students' contact information was acquired when they met the inclusion requirements. Then, they received an email inviting them to participate in the present study. 329 students willing to participate in the study as a control group were given the data collection tools to complete online. These data were regarded as baseline information relevant to the current investigation.

320 students who enrolled in the same selected courses simultaneously after ODL had been started due to (COVID-19) in the autumn of 2020 agreed to participate in the current study as a study group. They asked to fill out (Instrument 1) before the beginning of the semester, and 2nd instrument was completed at the end of the courses after the results by GPA had been announced.

Measurement and data collection

Two tools were framed to collect data pertinent to the current study.

1-   Self-administrated a brief demographic questionnaire was created to gather details on the participant's gender, course type (clinical or theory), and enrollment academic level.

2-   The Students' Learning Perception Questionnaire (SLPQ) an adopted inventory used in the current study to measure students' perception as a dependent variable. This metric instrument is utilized to evaluate the effectiveness of provided learning methods as perceived by the students in terms of students' approaches to learning (SAL). It's a reliable instrument with a Cronbach's Alpha of 0.76 (Entwistle, 2009; Postareff et al., 2018).

SLPQ consists of (12 questions) that measure the three main approaches to learning, each with four items (deep, surface, and organized approach to learning. SLPQ Items were graded on a five-point Likert scale (one being totally disagreed and five being completely agreed) (Parpala et al., 2013; Postareff, Mattsson and Parpala, 2018a). Each student's results were added up for interpretation; those who received less than 25% were considered to have a low perception, those who received (26 - 75%) were thought to have a moderate level, and those who had more than 75 % were thought to have strong perception.

Data analysis

The descriptive and inferential statistics among the study and control subjects were examined using the SPSS software IBM SPSS Statistics 20. The normality of the variables was examined using the Shapiro-Wilk test, histograms, and Q-Q plots. Non-parametric tests were utilized in the analysis since the variables were non-normally distributed. The Mann-Whitney U test (Z) was used to compare the responses of the control and study groups. Statistical significance was defined as a p-value of 0.05 or less. Additionally, the effect size was used as a parametric measure to evaluate the clinical relevance of the measured statistical difference. The current study was chosen to use an arbitrary and more conservative cut-off. Since this impact or difference could reflect a moderate effect that might interest clinical practice, an effect size > 0.4 was judged clinically relevant (Cohen, 1988).

Ethical considerations

Official approval for the study's execution was obtained, and the Research Ethics Committee approved the research study (lRB:2019041701). Full explanations were given to participants in relation to the study's goals, methodology, and advantages. Each participant is free to withdraw from the study whenever they choose. Participants' informed consent was acquired. The subjects' confidentiality and anonymity are guaranteed by the coding of all data. Data were exclusively used for the research.

III. Result

346 out of 649 (the total students) that took part in the current study were female, divided into 174 from the study group and 172 from the control group. 50.8% of selected students studied a nursing research course (theory), whereas 49.2% studied a health assessment course (clinical). 50.8% of the sample was at the second academic level. Participants' gender, study courses, and academic level were all homogeneous across the study and control groups and regularly distributed with no differences (P-value > 0.05) (Figure 1).
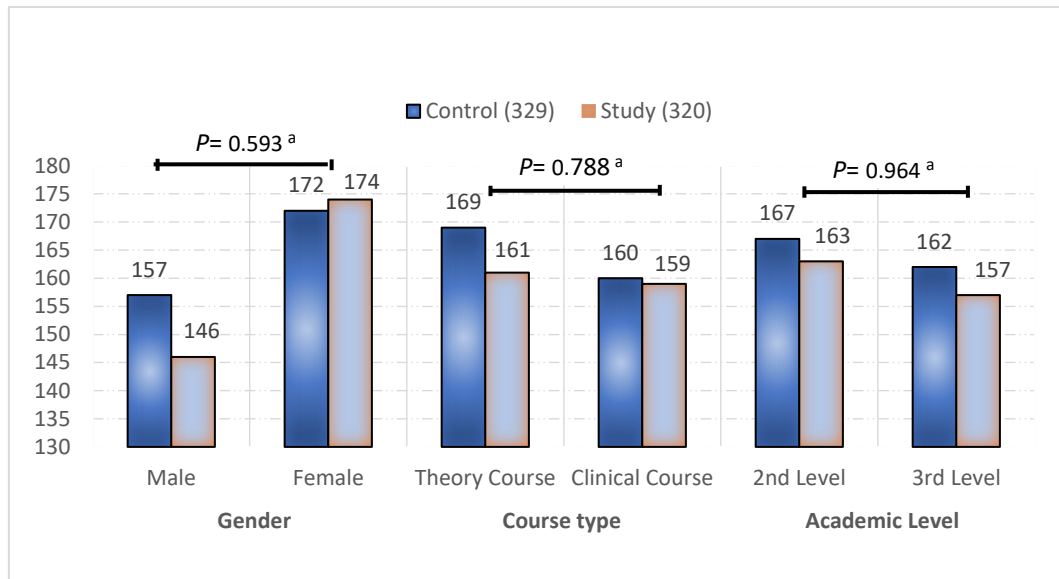
[a] Chi-square test.

Figure 1. Demographic characteristics of the studied subjects in relation to their gender, study courses, and academic level (n=649).

Figure 2 illustrates that the control group's mean age was 20.15 years, with a narrow SD (+0.89). Also, there was no difference with the control group (P value 0.296).
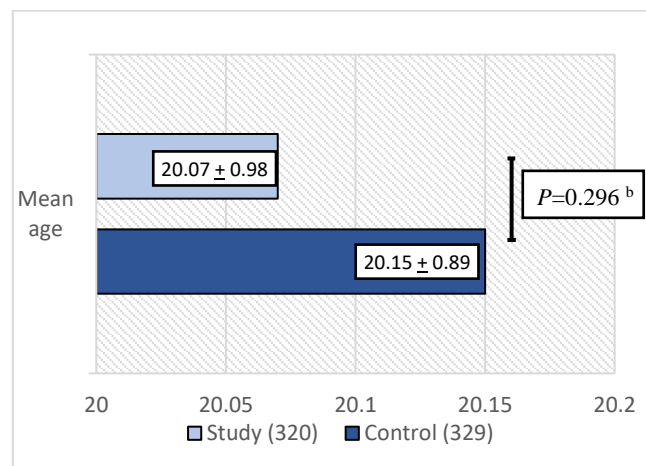
[b]Independent Samples t test

Figure 2. Demographic characteristics of the studied subjects regards their age (n=649).

Table 1. Difference between the study & control groups regards the SLPQ's, as perceived by the students.

#	Items	Mean ± (SD)		Mann Whitney *U*- test		Effect size
		Control N = 329	Study N =320	*U* value	*Z* value (*p*)	
1	Making sense of learning needs is hard.	2.98 ± (1.08)[c]	3.37 ± (1.12)[c]	41579.5	-4.80 (.00)	-.390
2	I worked very hard at my studying.	2.96 ± (1.10)[c]	3.39 ± (1.13)[c]	40672.5	-5.19 (.00)	-.430
3	What I learn incoherent.	3.40 ± (1.11)[d]	2.71 ± (1.17)[c]	35048.5	-7.57 (.00)	.685
4	My studying generally systematic.	2.98 ± (1.09)[c]	3.46 ± (1.31)[d]	40923.0	-5.05 (.00)	-.480
5	I consider ideas and given various perspectives.	2.96 ± (1.08)[c]	3.49 ± (1.32)[d]	39818.0	-5.52 (.00)	-.527
6	I look at evidence to reach my own conclusion.	2.72 ± (1.17)[c]	3.38 ± (1.29)[c]	37063.5	-6.68 (.00)	-.664
7	I can't realize what complicated topics mean.	2.73 ± (1.18)[c]	3.37 ± (1.29)[c]	37542.0	-6.48 (.00)	-.645
8	I organize my study time carefully.	2.98 ± (1.10)[c]	3.39 ± (1.14)[c]	41205.0	-4.95 (.00)	-.412
9	I review material often, but I still can't remember it.	3.00 ± (1.11)[c]	3.40 ±(1.13)[d]	41813.0	-4.69 (.00)	-.390
10	I have a plan established to achieve the course material.	2.99 ± (1.12)[c]	3.47 ± (1.32)[d]	40857.5	-5.07 (.00)	-.484
11	I try to relate new information to what I already know.	2.98 ± (1.11)[c]	3.38 ± (1.14)[c]	41528.5	-4.81 (.00)	-.399
12	I connect what I've learned in one course to what I've studied in others.	2.96 ± (1.11)[c]	3.39 ± (1.14)[c]	40883.0	-5.09 (.00)	-.430

[a](1- 1.79) Strongly disagree, [b] (1.80 -2.59) Disagree, [c] (2.60 -3.39) Not sure, [d] (3.40 -4.19) Agree, [e] (4.20 -5) Strongly agree

As you can see in table 1, there is a highly significant statistical difference between the study's response and control group regarding SLPQ's subitems (p<0.05). Furthermore, almost the measured average for the 12 items of SLPQ located between (2.60 – 3.39) which is considered as (not sure or neutral) (Pimentel, 2019). While, items number 4, 5, 9, 10 in the study group were perceived as (agree) response with mean + SD (3.46 + 1.31), (3.49 + 1.32), (3.40 + 1.13), and (3.47 + 1.32) respectively. Item number 3 was the only item perceived as (agree) response between the control group with mean + SD (3.40 + 1.11). Items number 1, 9, and 11 were considered low clinically relevant with small (<.4) effect size (-.390, -.390, and -.399), respectively. While other items were considered clinically relevant with moderate (>.4) effect size.

Table 2. The difference between study and control students regards to their overall response to SLPQ.

	Weighted Mean ± (SD)		Mann Whitney *U*- test		Effect size
	Control N = 329	Study N =320	*U* value	*Z* value (*p*)	
SLPQ (12 items)	2.97 ± (0.934)[c]	3.35 ± (0.785)[c]	37464.0	-6.36 (.00)	-.380

[c]According to weighted mean for 5-point Likert Scales (2.60 – 3.39) considered as not sure response.

To evaluate the difference between the study and control group for assessing the overall students' learning perception using Mann Whitney U test, a significant statistical difference in students' response SLPQ (p = 0.00) with a moderate clinically relevant effect size (-.380) according to Cohen criteria (1988) (table 2).

Table 3. Study vs control group ANOVA of students' responses to the SLPQ in terms of their approaches to learning (SAL) (No. 649).

Subcategory of the Questionnaire	No. of Items	Control (No. 329) Mean ± (SD)	Study (No. 320) Mean ± (SD)	F	P	Total Mean ± (SD)	F	P
Deep	4	2.90± (0.83)[c]	3.41± (0.80)[d]	61.15	.00*	3.15± (0.86)[c]		
Surface	4	3.03± (0.96)[c]	3.21± (0.94)[c]	6.10	.01*	3.12± (0.95)[c]	1.22	.29
Organized	4	2.98± (1.07)[c]	3.43± (0.84)[d]	35.14	.00*	3.20± (0.99)[c]		

[c](2.60 -3.39) Not sure, [d](3.40 -4.19) Agree
*p< 0.05

Table 3 reveals that all participants used the three approaches without significant differences (p = 0.29). However, the most perceived approach was an organized approach, with a mean (3.20). Moreover, table 3 shows the study group's response was greater than the control group, with highly significant differences in their perceived approaches to learning; deep, surface, and organized approach with p value (0.00, 0.01, and 0.00), respectively. Also, almost of the students' responses were located between the average mean (2.60 – 3.39), which is considered as (not sure or neutral) except, the study group response to the deep and organized approaches were located between the average mean (3.40 - 4.19) which considered as (Agree) response.

Table 4. The impact of students' gender, academic level, age, and course type on their perceptions (SLPQ).

	SLPQ response		*p*
	Control (329) Mean ± (SD)	Study (320) Mean ± (SD)	
Gender:			.415 [a]
Male	3.22 ± (1.09) [c]	3.29 ± (1.03) [c]	
Female	3.14 ± (1.11) [c]	3.24 ± (1.08) [c]	
Course type:			
Research in Nursing (theory)	3.12± (1.10) [c]	3.21 ± (1.13) [c]	.045 [a*]
Health Assessment (clinical)	3.42 ± (1.11) [d]	2.64 ± (1.17) [c]	
Academic level:			
2nd Level	2.96 ± (1.03) [c]	3.39 ± (1.09) [c]	.455 [a]
3rd Level	3.20 ± (1.11) [c]	2.91 ± (1.13) [c]	
Age:			
Mean ± SD	2.96 ± (1.14) [c]	3.39 ± (1.10) [c]	.500 [b]

[a]Independent Samples t test.
[b] Bivariate Correlation.

Table 4 reveals no significant differences between students' gender, academic level, and age and their measured outcomes SLPQ. While there are substantial differences between course types and students' perception p (0.045) caused by the low perception of the study group regards the selected clinical course.

IV. Discussion

Only a few studies have examined students' perceptions of TCL versus ODL globally. While ODL research has been conducted in Egypt (abdel-Wahab, 2008; Afifi, 2011; Lassoued, Alhendawi and Bashitialshaaer, 2020), the current study is one of the first in Egypt to focus on analyzing nursing students' perceptions regards to the inadvertent shift from face-to-face instruction to online instruction as a result of the COVID-19 epidemic and the execution of the preventative necessary related measures. Even if Egypt began to invest in 1985 to build its ICT infrastructure to support e-learning activities(El-Khouly, 2018), When the COVID-19 epidemic attacked the world in early 2020, academic members accelerated the inevitable shift to virtual learning, which had only had little expansion in Egypt up to that point.

Since a sudden unplanned shift to ODL has arisen recently in academic education, the current study aimed to assess the nursing students' perception toward shifting from traditional classroom to online distance learning due to (COVID-19) social distancing measures in addition to investigate the impact of students' demographic.

This study reveals that there is a significant statistical difference but no clinical relevance between the students who learned by online approach (study group) and students who learned in a TCL (control group) in relation to their overall learning perception indicated by the Students' Learning Perception Questionnaire (SLPQ). Also, at the level of each item of SLPQ almost all were perceived by the study group as better than the control group, with a highly significant statistical difference. Congruently, (Richardson, 2005) reported that distance learning students might have different approaches to learning from those of campus-based students. Also, (YILMAZ, 2019) reveals that the perception of ODL is more positive than the TCL. Such findings may be due to distance learning providing an opportunity to study while engaging in other activities, and minimizing transportation fees. Also, it provides more flexibility in selecting the preferred time to learn. Students can learn at their own pace. It also enhances self-learning, is more convenient, interesting, and even though ODL works as a temporary alternative due to COVID-19.

On the other hand, (Harper and Kember, 1986) compared approaches to learning of matched groups of internal (on-campus) and distance education students and reported that there was statistically no significant difference in students' approaches to learning. Consistently, (Bączek et al., 2021) also noted that face-to-face and online learning were perceived as having no statistical distinction in gaining knowledge. Besides, (Laili and Nashir, 2021) found that almost all students prefer in-person instruction over ODL.

Since the SLPQ was formulated in terms of students' approaches to learning (SAL), the current study found that the allover study subjects used the three approaches to learning (Deep, Surface, and Organized) with no significant differences. However, the most overall frequently perceived approach was the organized approach among study and control groups; the lowest perceived approach was a surface approach. The deep and organized learning approach between the control group was opined as (neutral) while it was perceived higher among the study group as (agree) with a highly significant difference. As prior research has demonstrated, intrinsic motivation is often favorably correlated with both organized studying and a deep approach to learning (Moneta & Spada, 2009; Postareff et al., 2018; Prat-Sala & Redford, 2010) Nevertheless, the surface learning approach was perceived as (neutral) among both groups, and there is a statistically remarkable distinction between the study and control groups.

Moreover, the study group's response was greater than the control group, with highly significant differences in each type of learning approach. In the same line, previous studies have found that students who learn at a distance also get higher scores on the SAL measuring inventory's subscales (Harper and Kember, 1986; Wong, 1992; Richardson, Morgan and Woodley, 1999).

We believe that many factors can affect SAL, such as time of assessment, course study burden, previous students' feedback, teacher and student personality traits, and course delivery method. However, the current study stated that there were no statistically significant variances between the adopted three investigated approaches to learning among the study subjects, which may be due to the similarities between the studied subjects in relation to experience, interest, demographics, and challenges faced. Consistency (Bączek et al., 2021) implies that face-to-face and online learning were perceived with no difference in terms of gaining knowledge. On the other hand, a dearth of studies, such as (Laili and Nashir, 2021), said that the majority of students favor face-to-face learning over online learning.

The majority of the student's responses to the questionnaire's items were measured as (not sure or neutral). It may be due to student has little experience using these kinds of inventories and they are unsure of their own perceptions; hence they choose odd-numbered Likert middle response to express their response.

The current study found that students' perception is not affected by gender, academic level, or age. This finding may result from narrow variation with high degree of homogeneity between the study and control group in relation to their age, academic level and gender. This finding is convergent with (Neuhauser, 2002), who studied learning style and effectiveness of online and face-to-face instruction and reveals statistically insignificant differences between the two groups of students in demographics. On the other side, a number of studies reported that age and gender were affected by the students' learning approach, such as (Harper and Kember, 1986; Richardson, 2005). Furthermore, Richardson, 2005 concluded that age and gender are not affecting students' course perceptions and perceptions of the academic environment which is congruent with the current study. This result is divergent to (Prosser and Sendlak, 1994), who reveals that demographic characteristics of the students themselves influence students' perceptions of the learning. Moreover, (El Refae, Kaba and Eletter, 2021) demonstrated that the demographic characteristics of the students demonstrated a significant between F2F learning and DL in relation to their GPA. Consistently, (Amro, Mundy and Kupczynski, 2015) demonstrated that the average grade of face-to face students was higher than the average grade of online students.

The course type (clinical / theory) is the only demographic distinctive that affects students' perception indicated by SLPQ. This finding may be due to the lack of interaction in distance learning with the teacher, colleagues, clinical instruments, and real clinical environment, specifically in clinical courses, whereas it realized better classroom learning. Also, students in Egypt rely more on the presence of the clinical instructor. However, a number of previous studies identify e-learning as more effective compared with face-to-face learning on students' achievement such as (Goldberg and McKhann, 2000; Gossenheimer et al., 2017)

V. Conclusion

The study shows a statistically significant difference between ODL and TCL regarding the replies of all students as measured by the SLPQ, however, this difference is only moderate clinically significant. The study group that learned online scored nearly all questionnaire items more favorably than the control group when compared item by item. In the research and control groups, there is a significant difference in how students perceive the clinical course under study, but not how they perceive the theoretical courses. This study concludes that although students in poor nations can adjust to the unforeseen transition from TCL to ODL, they see ODL as a more effective learning approach than TCL since online learning does not facilitate clinical course study.

Every educational establishment must consciously raise its investment in technical reform and digital transformation in order to respond to the present changing in learning needs. As a result of the current study's findings, educators should apply a range of learning techniques, such as (face-to-face tutorials, residential, and teleconferencing). In addition, unscheduled transactional time from traditional to completion may be helpful for blended or hybrid learning. The current study's findings imply that ODL could replace in-person instruction in theory courses but not in clinical courses like nursing practical skills.

Limitations

Since administrators and professors may have different perspectives from nursing students, the data is solely based on their observations. The sample used in the current study was taken from two bachelor's academic levels and didn't include all grades. Future studies should use a diverse representative group to overcome this barrier. Since this is the case, generalizations about students who are not nursing students are unworkable.

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