Gerontological Nursing Students' Perception and Stress of Online Learning during COVID-19 Pandemic

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Abstract

The educational system has been extremely affected by COVID-19 pandemic; it forced the shutdown of the institutions of higher education, which adversely affected student, teaching and learning across the world. **Aim:** Determine gerontological nursing students' perception and stress of online learning during COVID-19 pandemic**. Design:** A descriptive study was utilized. **Setting:** Faculty of Nursing, Mansoura University, Egypt. **Subjects:** A convenient sample of 265 undergraduate students registered in gerontological nursing course in the 2nd semester during the academic year 2020/2021. **Tools**: The researchers developed an electronic self-administered questionnaire that conducted on the Google Forms platform it composed of three tools; Nursing Students' Demographic Data and Academic Performance Structured Questionnaire, Nursing Students' perception towards online learning and Perceived Stress Scale. **Results**: Regarding students experience with online learning 59.6% had previous experience, 74.7% use smart phones and 57.7% were satisfied of online learning. 78% reported that online learning should be continued during this pandemic. In addition, a strong negative correlation was found between online learning perception and academic stress among the studied students. **Conclusion**: More than half of gerontological nursing students had moderate level of stress and positive perception towards online learning. Level of stress and perception towards online learning may depend on several factors including, sex, GPA, father and mother's education level, and family income. **Recommendations:** Training programs should be conducted to nursing students about using online learning platforms to improve their self-confidence in using it.

Keywords: Academic stress; COVID-19 pandemic; Gerontological nursing students; Online learning perception.

Introduction

COVID-19) is a recent concealed infectious disease that spreads through droplets from one person to another **(World Health Organization, 2021)**. The virus was first discovered in Wuhan, China in December 2019 **(AlAteeq et al., 2020).** With an effort to reduce and stop the virus's spread, a lot of methods and preventative measures were implemented **(Omar et al., 2021)**. Educational institutions in the affected regions are turning to momentary solutions (online learning) to keep classes running. The availability and efficiency of digital tools have an impact on the learning quality. The online learning platform has been appreciated and accepted by students and educational institutions all over the world **(Sá, & Serpa, 2020).**

Online learning or e-learning referred to education that occurs entirely or partially through the multimedia and internet platform **(Aristovnikb et al., 2020)**. In Egypt, the traditional, face to face, learning is the most eminently used **(Oducado & Estoque, 2021).** Otherwise, during COVID-19 pandemic e-learning is increasingly becoming part of the education system globally. The extraordinary occurrence of COVID-19 changed how student nurses are educated and trained where most of the teaching-learning in nursing education is physical. Through epidemic, students are

obligated to use the virtual classrooms to finish the courses in time **(Garg et al., 2021).**

The student' perception toward online learning depends on their awareness level, the willing to get involved, and the level of familiarity with information technology along with adapting to the online learning methods **(Xhelili et al., 2021).** Most of nursing students rate online learning as the best solution throughout COVID-19 pandemic. Conversely, problems as online learning system unfamiliarity, connectivity limitation, and technical support limitation prevent them from effectively applying online lessons. **(Neupane , 2021).**

Through COVID-19 pandemic, students induced online learning are fronting extreme changes in living styles and study habits owing to the loss of many academic resources access as computers and internet connection and distractions in the home learning environment **(Zhang et al., 2020, Licayan et al., 2021 and Malik & Javed , 2021)**. All of these challenges as well as students' apprehension from lower performance and delays in completing required studies in addition with the lockdown period during the COVID-19 pandemic have a strong potential to cause mental health problems **(Harefa et al., 2021).** One of the most common mental health problem experienced by college students is the academic stress that is experienced because of students' fear of missing grades and failing **(Clabaugh et al., 2021)**

Perceived stress (PS) is the thoughts or emotion experienced when an individual feel that his demands exceed his personal and coping resources. Confronting the changes in study habits and living styles occurred with COVID-19 experiences, the PS between students can be defined as the imbalance between their living and online learning needs during the pandemic and the existing social support and self-capabilities **(Wang et al., 2021).** Numerous studies reported that, high levels of PS among students have strong impact on their mental health and negative impact on their academic performance **(Son et al., 2020, Rogowska, Kuśnierz, Bokszczanin 2020 and Wang et al., 2021).**

Therefore, assessing perception of gerontological nursing students and their perceived stress towards online learning is crucial to evaluate academic performance, the curriculum changes and to assess quality, pinpoint the strengths, and identify areas of the improvement. Moreover, the findings of the current study might assist for successful application of online learning in the upcoming years. Hence, perception of gerontological nursing students and their perceived stress of online learning should be investigated.

Significance of the study

At the beginning of 2020, many countries have closed most sectors including the education sector due to unfamiliar situations caused by outbreak COVID 19 pandemic. The Egyptian ministry of higher education emphasized the necessity of E-learning implementation in the universities to facilitate learning process for the learners. However, the Egyptian universities had no previous experience in online learning platforms and not trained for utilization of this novel teaching strategy (**Amin, and Hussien, 2021)**. Gerontological Nursing Department, Faculty of Nursing, Mansoura University was not an exemption from these changes. So, the current study aimed to determine the perception of gerontological nursing students toward the effectiveness of online learning and their level of academic stress during The COVID-19 pandemic. Furthermore, the results of the current study may help in successful implementation of online learning in the coming years.

Research aim:

The current study aimed to determine Gerontological Nursing Students' perception and stress of online learning during COVID-19 pandemic.

Research questions:

Q1: What is the perception and its associated factors of gerontological nursing students towards online learning during COVID-19 pandemic?

Q2: What is the level of perceived stress and its associated factors of gerontological

nursing students towards online learning during COVID-19 pandemic?
Q3: Is there any relationship between perception and stress of gerontological nursing students towards online learning during COVID-19 pandemic?

Operational definitions:

-**Students' Perception** is the way of regarding, viewing or interpreting online learning. It is the student belief or attitude toward online learning that may be negative or positive.

- **Students' Stress** is the degree to which the students perceive online learning in his or her life as stressful.

-**Online Learning (e-learning)** used in this paper refer to distance learning happening via online mode including live online classes via Zoom or Microsoft Teams, self-paced online modules on the Mansoura University's learning management system "MyMans", or both.

Method

Design:

A descriptive study was utilized.

Subjects& Setting:

The study included 4th level undergraduate students at Faculty of Nursing, Mansoura University who enrolled in gerontological nursing course in the second semester during the academic year 2020/ 2021; and experienced online learning during the COVID-19
pandemic. Gerontological nursing course is a credit hours course that includes 2 Hours/ week for theoretical content and 2 hours /week for clinical practice for a period of 14 weeks. A convenient sample of 265 students out of 272 accept to share in the study while 7 students refused (The response rate was 97.4%).

Tools of data collection:

An electronic self-administered questionnaire was developed by researchers and conducted on the Google Forms platform and composed of three tools of data collection.

Tool I: Nursing Students' Demographic Data and Academic Performance Structured Questionnaire:

It was developed by the researchers and included questions about:

Part I: Demographic data include students' age, gender, marital status, and place of residence.

Part II: Academic performance was measured by Grade Point Average (GPA) which is statistic that reflects how well student achieved on average in registered courses. GPA scale is from1.0 to 4.0 where score 4 to 3.3 is considered very high achievement, 3.2 to 2.0 is satisfactory achievement, while < 2 is failed (**Fadila, & Elsayed2018).**

Part III: Online learning related information such as receiving e- learning prior COVID 19, type of device utilized, type of internet connection, internet accessibility at home, and student's self-reported level of satisfaction from online learning.

Tool II: Nursing students' perception towards online learning:

Based on relevant literature (**Parker & Martin, 010) and Çakýroglu, 2014),** the researchers developed this tool to assess students' perception of towards online learning. It compromised 24 sentences using five Point Likert scale (5= Strongly agree, 4= Agree, 3= Neutral, 2= Disagree, 1= Strongly disagree). The total score ranges from 24 to 120 and was categorized as follow:

- Positive perception: A score more than the median (80).
- Negative perception: A score equal or less than the median (80).

Tool III: Perceived Stress Scale (PSS):

This was developed by **Cohen, et al., (1983)** which is self-reported scale include 10 sentences to assess stress perception by the students in the past month. A phrasal modification was made to the scale by adding "of online learning" at the beginning of each sentence without changing the meaning **(Kabir et al., 2021)**. The students' responses were based on a five point Likert scale (Very often=4, Fairly often =3, Sometimes =2, Almost never = 1, Never = 0). Four statements from the scale (4, 5, 7, and 8) negatively stated and reversely

scored. Total score obtained by summing up all item scores. Overall scores range from 0 to 40 in which 0-13 considered low stress, 14-26 considered moderate stress, while 27-40 considered high stress.

Field work

I: Preparatory phase:

- ***Administrative stage*:** Approval was attained from the Dean of the Faculty of Nursing, Mansoura University and the Head of gerontological nursing department to conduct the study.
- ***Literature review*;** Study tools I (Nursing Students' Demographic Data and Academic Performance Structured Questionnaire) and II (Nursing students' perception towards online learning) after reviewing the relevant literature were developed by the researchers.
- The study tool III (PSS) was translated into Arabic language by the researchers and Validity of the translation was checked by an expert of English language from the Faculty of Education. To ensure the validity of the translation, back translation technique was used in this study.
- ***Content validity***: The study tools' content validity was tested by panels of five expertize in gerontological nursing and nursing education field. The changes were made based on the panel's assessment of the sentences' clarity of the topic appropriateness. The percentage of consensus among experts regarding online perception scale was 97% and 98.0% for PSS.
- ***Face validity:*** A pilot study was performed on 10% (27) of students before data collection to realize the feasibility, applicability and clarity of the study tools and determine the time needed to complete the tools. No modifications were carried out, so the sample selected for pilot study was included in the study sample.
- ***The reliability***: Reliability of the study tools was done using the Cronbach alpha test (α = 0.86 and α = 0.81 for online perception scale and PSS respectively), indicating good internal consistency in this study.

II: Operational phase;

In compliance with implementing the lockdown of educational institution by the Egyptian government and reducing physical or face-to-face interaction, an online survey was conducted through the online google forum.

- The distribution of questionnaires to the students was conducted electronically. It was presented to the students through Google forms and they were asked to accomplish the forms and submit them automatically. The researchers sent an email with a hyperlink (https://docs.google.com/forms/d/e/1FAIpQLSfle9cDA5eb3tlUWKkUsL2eSWCjQXGncg7h97lxa8tr0g5qoQ/viewform) and a brief message about study purpose was available to the students through the WhatsApp application. The questionnaire was available for the student to fill out once.
- Students' academic performance (GPA) was obtained from the Faculty of Nursing records.
- The survey was available for 21 days (three weeks), and during this time, two email reminders were sent on the 7th and 14th day after being opened. The collected data taken from 15 April to 7 May, 2021.

Ethical Considerations

An ethical approval was taken from Ethic Committee in Faculty of Nursing at Mansoura University. After explanting the nature of the study, informed consent was taken from the eligible students. The students received a cover letter clarify the purpose of the questionnaire given, and the study inclusion criteria. Students were known that the survey was anonymous, the participation was elective, not related to course grades and they were free to withdrawal without penalty at any given time in the study. Intellectual property rights were maintained and plagiarism was avoided through careful citations.

Data analysis:

Statistical package for social science (SPSS) version 20 was used to analyze data. The One-sample Kolmogorov-Smirnov test used to determine the normality of data. Qualitative data represented using number and percent while; continuous variables

represented as mean ± SD (standard deviation). Student t test utilized for comparing the means of two groups and Analysis of Variance (ANOVA test) utilized for comparing the means of more than two groups. To test correlation between continuous data, Pearson correlation used. Regression used to detect the most independent factor for perception and stress. Graphs were done using Microsoft Excel and Spss. The p-value (significant level value) was considered when the p-value ≤ 0.05.

Results

Table 1 revealed that mean age of the studied students were 21.71± 0.52 years. Female constituted 70.6%, 42.6% of their father & 54% of their mother had secondary educational level. Moreover 75.5 % live in rural area, and family income was not enough in 66.4%. As regards to academic performance 50.6% of them had very high achievement with a mean of 3.26±0.29.

Table2 revealed that 40.4 % of the studied students did not receive online class before COVID-19. 74.7% and 60.0%; respectively used smart phone and Wi-Fi for attending online class and 57.7% were satisfied from online learning.

Table 3 revealed that, 55.1 %of the studied students agreed that online learning easy to use, easy to manage study time effectively (54%), improves technical skill in using electronic devices (58.5%), ownership of laptop / android or other phones is essential (54%), recorded online class can be beneficial in the future (55.8%). However, 40.4% of them approved that learning environment in faculty is better than at home. Also, 41.1% and 40.8 % respectively of the students viewed that, there is lack of interaction during online classes and face-to-face communication with teacher is essential to learn. On the other hand, 28.3% of them agreed that there is lack of instructor's feedback.

Figure 1 shows that 54%of the studied students held positive perception towards online learning whereas 46% of them held negative perception.

Table 4 shows the mean score of perceived stress scale "PSS" was 23.02±6.99, indicating a high stress level from online learning, in which 27.9% of the studied students expressed that they were unable to control important things in their life due to e-learning in the last month. While, 41.1% of them very often angered in the last month because of things that happened that were outside their control and 44.5% of them felt confidence in the ability to handle their personal problems sometimes in the last month.

Figure2 shows level of perceived stress among the studied gerontological nursing students. It is observed that of 52.5% the studied students had moderate perceived stress and only 9.4% had mild perceived stress.

Table 5 reveals that sex, father's & mother's education significantly affect total mean score of Perception and perceived stress (P= <0.05). In addition, a significant statistical relation was found between the study students' family income and their perception P=0.019, while students' academic performance affect significantly their perceived stress P=0.035.

Table 6 reveals a statistically significant relation between mean score of perception and perceived stress mean score and all online learning related information P= (<0.05).

Figure 3 declared a strong statistically significant negative correlation between mean perception and mean perceived stress of the studied students towards online learning P=(0.001).

Table 7: It noticed from the table that, sex, should continuing online learning during pandemic, satisfaction of online learning, and previous online learning experience were significant independent predictors for students' perception (β -0.120,-0.119, -0.138 and -0.291respectively), while satisfaction of online learning and own learning environment were significant independent predictors for students' stress (β= 0.349 and 0.183 respectively) $p < 0.05$ for all.

Table (1): demographic characteristics and academic performance of Gerontological nursing students

Demographic characteristics	**N (265)**	**100%**
Age		
Mean ± SD	21.71±0.52	
Sex		
Male	78	29.4
Female	187	70.6
Father's education level		
Illiterate	48	18.1
Secondary	113	42.6
University	104	39.2
Mother's education level		
Illiterate	47	17.7
Secondary	143	54.0
University	75	28.3
Residence		
Rural	200	75.5
Urban	65	24.5
Family income		
Enough	51	19.2
Not enough	176	66.4
Enough and saves	38	14.3
Academic performance (GPA)		
Satisfactory achievement (3.2 – 2)	131	49.4
Very high achievement (4 – 3.3)	134	50.6
Mean ± SD (Min – Max)	3.26±0.29	(2.25 - 4.00)

GPA= Grade Point Average

Table (2): Distribution of the studied Gerontological nursing students according to online learning related information

Items	N (265)	100%
Receiving online class before COVID-19		
Yes	107	40.4
Device used for attending online class		
Computer	5	1.9
Laptop	56	21.1
Tablet	6	2.3
Smart phone	198	74.7
Type of internet connection		
Wi-Fi	159	60.0
Cellular data	20	7.5
Wi- fi & Cellular data	86	32.5
Fixed sound / internet access		
Yes	158	59.6
Internet access facility at one's home		
Yes	216	81.5
Continuing online learning during this pandemic		
Yes	207	78.1
Students' self-reported level of satisfaction about online learning		
Strongly satisfied	52	19.6
Satisfied	153	57.7
Not satisfied	60	22.6
Students' self-reported level of satisfaction current home environment		
Strongly satisfied	73	27.5
Satisfied	152	57.4
Not satisfied	40	15.1

Table (3): Distribution of the studied Gerontological nursing students according to their responses to perception towards online learning questionnaire

Sentences	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean ± SD
	N (%)	N (%)	N (%)	N (%)	N (%)	
1- It is easy to online learning system	18(6.8)	22(8.3)	41(15.5)	146(55.1)	38(14.3)	3.62±1.04
2- Managing study time effectively become easy	21(7.9)	31(11.7)	33(12.5)	143(54.0)	37(14.0)	3.54±1.11
3- There is no specific preparation needed for online learning	22(8.3)	55(20.8)	52(19.6)	118(44.5)	18(6.8)	3.21±1.10
4-Learning is similar in classroom and at home on the Internet	61(23.0)	82(30.9)	34(12.8)	67(25.3)	21(7.9)	2.64±1.29
5- Online learning is more motivating than a regular course on classroom	59(22.3)	57(21.5)	47(17.7)	73(27.5)	29(10.9)	2.83±1.34
6- In online learning, it is easy to share ideas with colleagues	33(12.5)	41(15.5)	38(14.3)	107(40.4)	46(17.4)	3.35±1.27
7- The learners population does influence learning in online classroom	23(8.7)	48(18.1)	35(13.2)	119(44.9)	40(15.1)	3.40±1.19
8-Self-discipline is essential while studying online	9(3.4)	11(4.2)	28(10.6)	150(56.6)	67(25.3)	3.96±0.91
9- During online class, student can ask his teacher questions and get a quick answer	22(8.3)	37(14.0)	46(17.4)	121(45.7)	39(14.7)	3.45±1.15
10-Online learning improves technical skill in using electronic devices	12(4.5)	17(6.4)	28(10.6)	155(58.5)	53(20.0)	3.83±0.97
11-Face-to-face communication with teacher is essential to learn	8(3.0)	26(9.8)	40(15.1)	108(40.8)	83(31.3)	3.88±1.05
12- It is convenient to communicate electronically during online lessons	19(7.2)	34(12.8)	38(14.3)	127(47.9)	47(17.7)	3.56±1.13
13-Online learning is better than traditional learning	49(18.5)	45(17.0)	56(21.1)	77(29.1)	38(14.3)	3.04±1.33
14- Student participation is low in online learning	24(9.1)	53(20.0)	64(24.2)	105(39.6)	19(7.2)	3.16±1.10
15- There is lack of interaction in online classrooms	28(10.6)	53(20.0)	41(15.5)	109(41.1)	34(12.8)	3.26±1.21
16- Lack of feedback from the instructor	23(8.7)	93(35.1)	58(21.9)	75(28.3)	16(6.0)	2.88±1.10
17- Lack of technical knowledge (unable to obtain practical knowledge)	33(12.5)	75(28.3)	42(15.8)	77(29.1)	38(14.3)	3.05±1.28
18-Single students dominate during online classes	31(11.7)	68(25.7)	41(15.5)	95(35.8)	30(11.3)	3.09±1.23
19-Online class cost low	43(16.2)	59(22.3)	48(18.1)	91(34.3)	24(9.1)	2.98±1.25
20-There is lack of understanding	38(14.3)	72(27.2)	59(22.3)	73(27.5)	23(8.7)	2.89±1.20
21-There is lack of concentration in online classes	42(15.8)	67(25.3)	46(17.4)	86(32.5)	24 (9.1)	2.94±1.25
22-Ownership of laptop / android or other phones is necessary for online learning	9(3.4)	19(7.2)	78(29.4)	143(54.0)	16(6.0)	3.52±0.84
23-Online recorded classes can be beneficial for the future	6(2.3)	8(3.0)	25(9.4)	148(55.8)	78(29.4)	4.07±0.843
24- The learning environment in the faculty is better than at home	19(7.2)	37(14.0)	61(23.0)	107(40.4)	41(15.5)	3.43±1.12
Total Mean Score (SD)		**Min**	**Max**	**Median**		
79.56 (8.19)		37	110	80		

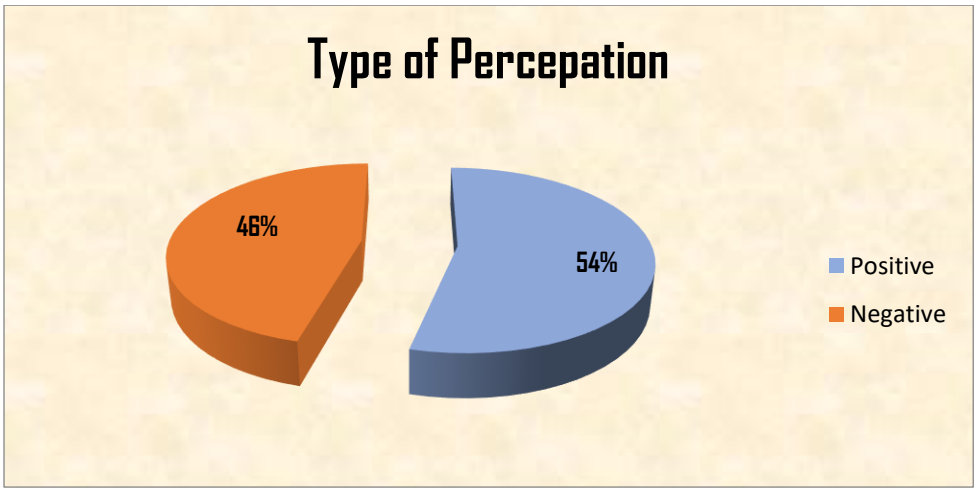

Figure (1): Type of perception towards online learning among the studied gerontological nursing students

Table (4): Distribution of the studied Gerontological nursing students according to their responses to perceived stress**.**

Statements	Never	Almost never	Sometimes	Fairly often	Very often	Mean ± SD
	N (%)	N (%)	N (%)	N (%)	N (%)	
In the last month of online learning, how often have you**:**						
1. Been upset because of something that happened unexpectedly?	5 (1.9)	76 (28.7)	71 (26.8)	87 (32.8)	26 (9.8)	2.20±1.02
2. Felt that you were unable to control the important things in your life?	2 (0.8)	95 (35.8)	74 (27.9)	77 (29.1)	17 (6.4)	2.01±1.01
3. Felt nervous and stressed?	7 (2.6)	92 (34.7)	81 (30.6)	62 (23.4)	23 (8.7)	2.05±0.96
4. Felt confident about your ability to handle your personal problems?	3 (1.1)	34 (12.8)	72 (27.2)	118 (44.5)	38 (14.3)	2.58±0.92
5. Felt that things were going your way?	4 (1.5)	65 (24.5)	62 (23.4)	82 (30.9)	52 (19.6)	2.43±1.10
6. Found that you could not cope with all the things that you had to do?	3 (1.1)	86 (32.5)	64 (24.2)	82 (30.9)	30 (11.3)	2.19±1.04
7. Been able to control irritations in your life?	5 (1.9)	62 (23.4)	66 (24.9)	68 (25.7)	64 (24.2)	2.47±1.14
8. Felt that you were on top of things?	0	117 (44.2)	50 (18.9)	77 (29.1)	21 (7.9)	2.01±1.02
9. Been angered because of things that happened that were outside of your control?	6 (2.3)	22 (8.3)	43 (16.2)	85 (32.1)	109(41.1)	3.02±1.05
10. Felt difficulties were piling up so high that you could not overcome them?	4 (1.5)	97 (36.6)	67 (25.3)	69 (26)	28 (10.6)	2.08±1.05
Mean(SD)		Min	Max	Median		
23.02 (6.99)		4	40	23		

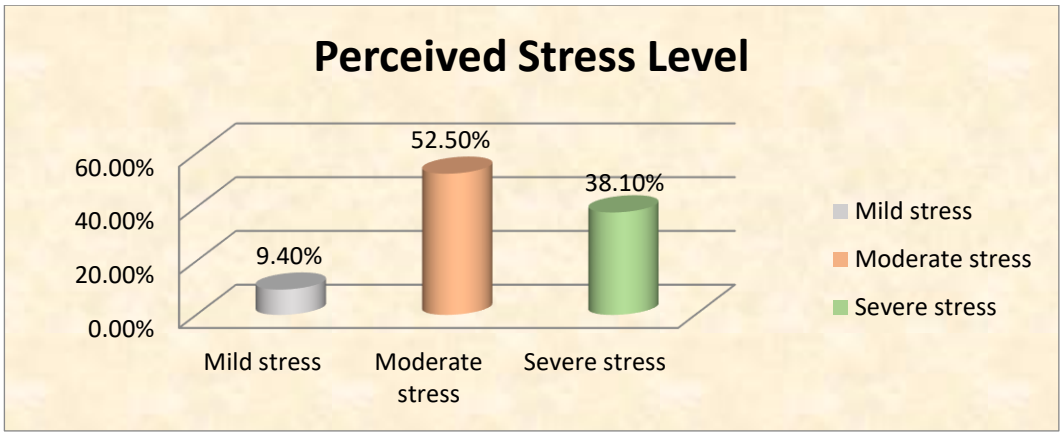

Figure (2): level of perceived stress towards online learning among the studied gerontological nursing students**.**

Table (5): Relation between demographic characteristics and academic performance of the studied students and mean perception and mean perceived stress towards online learning

Items	**Total**	**Total mean score of Perception**		**Total mean score of Perceived stress**	
		Mean ± SD	*Significance Test*	*Mean ± SD*	*Significance Test*
Overall Mean(SD)	**265**	79.56 (8.19)		23.02 (6.99)	
Sex					
Male	78	82.19±8.80	T=-3.445 P=0.001**	21.23±6.67	T=-2.717 P= 0.007*
Female	187	78.46±7.68		23.76±7.00	
Father's education level					
Illiterate	48	74.63±11.06	F= 11.315 P= (<0.001**)	25.44±8.45	F=3.746 P=0.025*
Secondary	113	80.3916±6.84		22.71±6.69	
University	104	81.06±7.36		22.06±6.24	
Mother's education level					
Illiterate	47	73.85±10.66	F= 16.346 P=(<0.001**)	25.97±8.43	F=6.408 P=0.002*
Secondary	143	80.34±7.23		22.96±6.61	
University	75	81.34±6.63		21.70±6.27	
Residence					
Rural	200	79.37±8.06	T= -0.670 P= 0 .504	22.77±6.87	T=- 0.981 P=0 .328
Urban	65	80.15±8.60		23.75±7.35	
Family income					
Enough	51	77.75±7.22	F= 4.005 P=0.019*	23.80±6.73	F= 1.653 P=0.193
Not enough	176	79.44±8.74		23.17±6.89	
Enough and saves	38	82.60±5.73		21.21±7.62	
Academic performance (GPA)					
Satisfactory achievement (3.2–2) points)	131	79.08±8.72	T= -0.955 P=0.341	23.93±6.82	T=2.124 P=0.035*
Very high achievement (4 – 3.3) points	134	80.04±7.63		22.12±7.06	

Table (6): relation between online learning related information and mean perception and mean perceived stress of the studied students towards online learning

Items	**N (265)**	**Total mean score of Perception**		**Total mean score of Perceived stres**	
		Mean ± SD	*Significance Test*	*Mean ± SD*	*Significance Test*
Do you receive online lessons before COVID 19					
Yes	107	82.06±6.43	T= 4.223	21.62±7.07	T= -2.694
No	158	77.86±8.81	P= (<0.001**)	23.95±6.79	P=0.008*
It is easy to access the internet					
Yes	158	81.51±6.53	T= 4.931	20.62±5.99	T= -7.421
No	107	76.67±9.47	P=(<0.001**)	26.54±6.88	P=(<0.001**)
Fixed sound / internet access					
Yes	216	80.25±7.86	T= 2.911	21.89±6.55	T= -5.816s
No	49	76.53±8.96	P=(<0.001**)	27.95±6.73	P=(<0.001**)
Continuing online learning during this pandemic					
Yes	207	81.23±7.54	T= 6.783	21.55±6.12	T= -6.979
No	58	73.60±7.64	P=(<0.001**)	28.22±7.44	P=(<0.001**)
Students' self-reported level of satisfaction about online learning					
Strongly satisfied	52	83.40±6.98	F= 38.272	16.94±5.25	F= 60.079
Satisfied	153	80.99±6.84	P=(<0.001**)	22.74±5.37	P=(<0.001**)
Not satisfied	60	72.58±8.32		28.96±7.18	
Students' self-reported level of students' satisfaction about current home environment					
Strongly satisfied	73	81.98±7.58	F= 12.226	18.09±5.63	F= 40.343
Satisfied	152	79.76±7.80	P=(<0.001**)	23.98±5.80	P=(<0.001**)
Not satisfied	40	74.37±8.55		28.32±7.98	

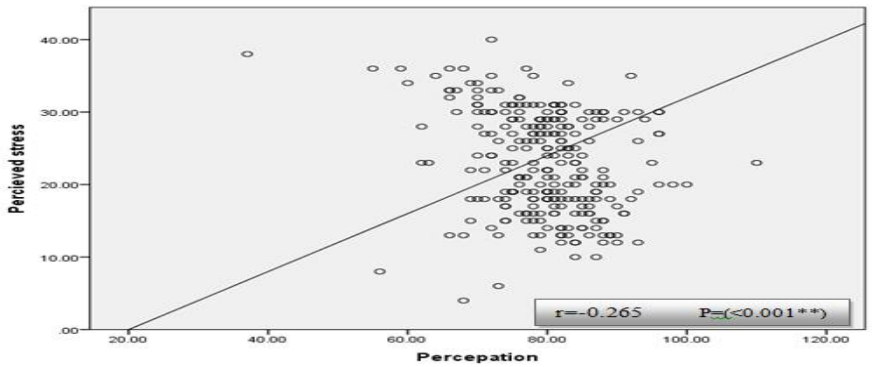

Figure (3): Correlation between mean perception and mean perceived stress of the studied students towards online learning

Table 7: *Multivariate linear regression analysis model for independent predictors of perception and stress of online learning.*

Model#	Perception		Perceived stress	
	P	B (95% CI)	P	B (95% CI)
Sex	0.030*	-0.120 (-0.959-2.191)	0.509	0.034 (-1.042-2.094)
Father's education	0.071	0.137 (-1.399-0.441)	0.218	-0.087 (-1.491-0.342)
Mothers education	0.377	0.066 (-0.517-1.419)	0.305	0.071 (-0.458-1.456)
Family income	0.059	0.109 (-0.890-1.676)		----
GPA	----	----	0.104	-0.082 (-2.527-0.236)
Previous online learning experience	0.033*	-0.119 (-1.715-1.227)	0.608	-0.027 (-1.846-1.083)
Easy to access the internet	0.406	-0.054 (0.072-3.495)	0.054	0.117 (-0.027-3.357)
Access to static –sound internet	0.579	0.034 (-0.523-3.528)	0.148	0.083 (-0.529-3.502)
Should continuing online learning during Pandemic	0.044*	-0.138 (-1.575-2.675)	0.655	0.029 (-1.636-2.598)
Satisfaction of online learning	0.000**	-0.291 (2.198-5.276)	0.000**	0.349 (2.230-5.273)
Satisfaction of own learning environment	0.333	0.071 (0.585-3.501)	0.005**	0.183 (0.591-3.386)
Perceived stress	0.474	0.044 (-1.308-1.659)	0.756	0.017 (-1.240-1.705)
	R^2 =0.298, F= 9.759, p <0.001		R^2 =0.388,F= 14.559, p <0.001	

#: All variables with P < 0.05*, were included in the multivariate, B: unstandardized coefficient; CI: confidence interval

Discussion

Similar to other countries around the globe, as a consequence of COVID-19 pandemic lockdown, institutions of higher education in Egypt closed. So, some higher institutions had to quickly shift from the face-to-face traditional teaching to online learning that was a main challenge faced by Egyptian nursing faculties for the first time **(Shehata et al. 2020).**

With respect to the studied students' characteristics, the current study illustrated that the majority of the students aged 22 years, female, residing rural area, had not enough income, and did not receive online classes before COVID 19 pandemic. These results resemble other studies done in Egypt by **Diab & Elgahsh, (2020)** and **Amin & Hussien,(2021)** and in Nepal by **Thapa et al., (2021)**. This may be owing to infrequent practice of online learning in Egypt before the COVID-19 pandemic. Online learning was only in its embryonic stage prior COVID-19 pandemic in Egypt.

Smart phones were the most common gadget used among students for attending online classes in this study and about two third of the students utilized Wi fi for attending the online class. This is may be attributed to all students did not have a laptop and also smart phone is easy to use anytime and anywhere. On the other hand, the Egyptian university students are main users of smartphone as well as of the majority of total Egyptian population own mobile connections and half of them have mobile internet connection **(Kibuacha, 2021).** In agreement with the studies were conducted by **Amin & Hussien, 2021** and **Diab & Elgahsh, (2020)** in Egypt, **Khan et al., (2021)** in India, **Koirala et al ., (2020)** in Nepal, and **Abbasi et al., (2020)** in Pakistan. Furthermore, the majority of the students had their own internet access at home in the current study. This is similar to a study conducted in Egypt by **Ismail et al., (2020)**. In contrast, a study conducted by **Amin & Hussien,(2021)** in Egypt in which more than three quarters of the students did not have internet facility at their home. This disparity can be attributed to difference in socioeconomic level of the studied students in this study and the students of the other studies.

With respect to behavioral intention, in the current study the majority of the students viewed that online learning should be continue through this pandemic and more than half of them were satisfied from online learning. This is in the same line with the results of other studies conducted by **Amin & Hussien, (2021)** in Egypt, **Kashoob & Attamimi, (2021)** in Oman and **Huang et al., (2021)** in Taiwan, However, the findings of the study of **Ayed, et al., (2022)** in Egypt and of **Baltà-**

Salvador et al., (2021) in Spain highlight that the majority of students were dissatisfied with their online learning.

The present study found that more than half of the students held a positive perception of online learning. This may be due to e-learning allow students to involve more activities into their days owing to reduce the need for traveling to university or for other students to clinical placements as well, learning at different times that suited students and accessing the learning material at appropriate times; therefore they perceive better management for their learning and time. The study of **Bączek, et al., (2021)** in Poland in Australia, **Moawad, (2020)** in Saudi Arabia resonated with our study findings. Moreover, studies conducted in Egypt by **(Mahdy & Sayed, 2021; Mahdy, 2021,** and **Amin & Hussien, 2021)** showed that the participating students feel enthusiastic and interest in studying online during the COVID-19 pandemic.

This also in agreement with other studies conducted in India by **(Khan et al., 2021; Chandragirish et al., 2021,** and **Muthuprasad et al.,2021)**, also a study conducted in Nepal by **Thapa et al., (2021)** in which majority of the students held a positive perception towards online classes in the wake of corona. In contrast, a study conducted among Nursing Students in Nepal by **Koirala et al., (2020)** showed that around half of students held negative perception about online learning. Also, another study was performed on medical students in Pakistani by **Abbasi et al., (2020)** observed that most of students r held negative perception about online learning.

Furthermore In this study, more than one third of students agreed and strongly agreed that online learning is preferable than traditional learning and more than half of the students agreed that online learning use is easy, mange time effectively and no preparation is needed. Several studies also support this result; **Mahdy & Sayed (2021), Amin & Hussien (2021) and Zalat et al., (2021)** in Egypt, **Almahasees et al., (2021)** in Jordan, **Cuschieri & Calleja Agius, 2020** in Malta and **Rojabi (2020)** in Indonesia.

Supporting our results, **Muthuprasad, et al., (2021)** in Nepal found that a round half of the students agreed that online leaning improves their technical skills compared to traditional face to face classrooms and the study of **Mahdy & Sayed (2021)** and **Mahdy,(2020)** in Egypt and **Yoo et al., (2021)** in Korea found that online learning improve their time management skills and provide opportunity for self-study. These finding indicated that gerontological nursing students prefer online learning over traditional methods in the classroom.

Interaction and collaboration in the online classroom still major drawbacks to online learning **Koirala et al., (2020)**. Despite about half of the students agreed that comfortable electronic communication through online classes is comfortable, more than two third agreed that contact face-to-face with teacher is necessary to learn and there is lack of interaction during online learing which is supported by a study of **Koirala et al., (2020)** in Nepal, **Daroedono et al., (2020)** in Indonesia. Lack of connectivity was the main barrier in online learning in the study of **Muthuprasad, et al., (2021)** in Nepal.

In an attempt to contribute to documenting the effects of the emerging Corona virus crisis on the higher education scene, this study provides a snapshot of gerontological nursing students' perceived stress.

Perceived stress (PS) has negative effects on the learning, academic performance, and well-being of nursing students **(Gurkova, Zeleníkov´, 2018; Labrague et al., 2018; Bhurtun et al., 2021).** Consistent with prior studies **(Clabaugh et al.,2021; Rosaline and Anggraeni ,2020)**, online learning had a negative effect on the psychological health of gerontological nursing students in terms of PSS in this study, that was reported as moderate to high by most of the students. This result may be due to students must have the ability to adapt the usual academic process in the classroom to the online learning process, which requires students to obtain a lot of coursework from each course lecturer, such as quizzes and independent & group assignments. Completing assignments that require a short time so that students lack rest and harmony among members for group assignments can trigger stress in students

Finishing assignments that require so little time make that students lack comfort and harmony and can create stress for students **(Rosaline and Anggraeni, 2020)**. Academic pressures usually lead to motivation and stimulate learning but can also lead to stress and anxiety, which are linked to adverse health

and academic outcomes **(Alshammari, et al., 2022)**. This finding is consistent with other researches finding that PS among nursing students increased through the epidemic to a moderate level and that fourth-year students had higher mean score of PS (**Aslan & Pekince, 2021** and **Sheroun et al., 2020).**

In the current study, the total mean score of perceived stress scale "PSS" was 23.02(±6.99), indicating a high stress level. In the same line, the mean score of PSS was 21.02(±4.90) in a study done by **Dwivedi et al., (2020)** in India, 20.37 (±7.67) in the study of **Kostić et al., (2021)** in Serbia, 21.88 (±4.30) in a study done by **Sheroun et al., (2020)** in Puna, 23.87 (±6.18) in a study done by **Li et al., (2020)** in China. A relatively higher mean score of stress in this study may be interpreted by studies performed prior to the COVID-19 pandemic that reported high stress and anxiety levels in nursing students than other students in different disciplines **(Stewart et al., 2018**; **Zeng et al., 2019)**. An observational and prospective study in Spain by **Gallego-Gomez et al., (2020)** demonstrated that stress levels had increased significantly among nursing students' post-lockdown. The study of A**slan & Pekince (2021)** on nursing students in Turkey and **Begam, & Devi (2020)** in India showed that the nursing students had moderate stress levels; nevertheless they had higher stress levels than students who had been assessed in the preceding year. Nursing students and persons employed in the nursing profession have been well-known as a population with higher stress level on account of the nursing program complexity **Ali and El-Sherbini, (2018).**

The study findings pointed out that, male student had higher mean score of perception than female students. This result may be justified by that males have had the freedom to use mobile and the internet in Egypt and also male students have more free times than female which enable them to attend training workshops and to read more about online learning which resembles the study of **(Mahdy 2021; Amin and Hussien, 2021)** in Egypt and the study of **Daryazadeh et al., (2021)** in Iran demonstrated that male gender is a significant factor. However a study done by **Almomani et al., (2021)** in Jordan reported that female students feel more optimistic, satisfied, and committed to the online learning experience during the COVID-19 pandemic compared to males.

Female students suffer unique stressors during the COVID 19 epidemic leading to poor emotional wellbeing **(Clabaugh et al., 2021)**. Supporting this, female students in this study report high significant level of stress from online learning during the COVID-19 pandemic. This may be owing to female students may be more likely to take on extra household or care responsibilities during quarantine compared to male students so matching academic activities with caregiving responsibilities may put them at particular risk for further stress during COVID-19. Likewise, females are more sensible to interpersonal and academic demands and more able to express their feelings, consequently, a high PS level was conveyed. Several studies done on the student within the COVID-19 pandemic stated higher level of perceived stress in females than males due to online learning **(Malik & Javed 2021; de la Fuente et al., 2021; Kostić et al., 2021;Kabir et al., 2021;Aslan & Pekince, 2021;Dwivedi et al., 2020; AlAteeq et al., 2020 and Li et al.,2020).**

In line with the result of **Koirala et al., (2020)** in Nepal, the current study also found a statistical significant association between perception and education level of father and mother. Also, higher parenting education was found to be significantly associated with lower perception of stress. This may be attributed the educated parents are more vigilant with new learning styles, expected grades, academic performances and coping strategies which have a role in perceiving lower stress. Similar result reported by the study of **Kabir et al., (2021)** in Bangladesh.

This study also found a statistically significant association between family income and perception. However, nursing students who had low family income perceived high stress levels nevertheless there no statistical relation between stress and household income. This may be because students from low socio-economic communities have limited financial ability to have access to necessary devices and internet connection which affect their perception and stress. Similarly, **Koirala et al., (2020)** in Nepal reported a statistically significant association of family income and perception and **Masha'al et al., (2020)** in

Jordan, nursing students with low family income had more overall stress levels.

High stress level among college students was most often associated with lower academic performance **(Alotaibi et al., 2020).** Through the current study, it was noticed that the academic performance had a negative relationship with students' perceived stress which is supported by other studies done by **Malik, & Javed, (2021)** in Oman and **Kabir et al., (2021)** In Bangladesh.

Essentially, higher education students with previous e-learning experience had significantly greater readiness and lower stress related to e-learning **(Händel et al 2020).** This study reveals that students with prior online learning experiences tend to express high perception and less stress from online learning with statistical significant association.

This result may be explained by prior studied on student preferences which found that previous experience with online course delivery leads to positive perception toward e-courses and also reflect the tendency for self-directed learners to take more online courses and benefit more from that **(Platt et al., 2014)**. Similarly, the study of **Kabir et al., (2021)** in Bangladesh, **Al-Balas et al., (2020)** in Jordan, **Wang et al., (2020)** in China and **Ayed et al., (2022)** in Egypt.

Access to static internet was significantly affect students' perception and students' stress in the current study. Essentially, the study of **Händel et al., (2020)** in Germany noticed that the technologically equipped students had significantly greater readiness and stress less from e-learning. Whereas, there was no statistically significant relation between students' perception and fixed internet access in the study of **Koirala et al., (2020)** in Nepal.

Furthermore, there was a highly statistical significant relationship between students' self-reported satisfaction from online learning and their perception and stress from online learning. The study conducted by **Wang et al., (2020)** in china reveals a positive association between students who realize online learning as useful tend to demonstrate positive perception from their current online courses. Also, **Hamaideh et al., (2022)** In Jordan and **Fawaz & Samaha, (2021)** in Lebanon where the students' satisfaction with online learning was also found to be a predictor for stress.

Lastly, this study revealed a strong negative association between perception towards online learning and perceived stress during the pandemic. This finding can be clarified by the fact that academic stress and perception can impair one's capacity to engage in online learning. Similarly, students' performance in online classrooms may be influenced or determined by their views of academic stress and coping abilities. This finding is in line with **Elashry et al., (2021)** in Egypt. Moreover, **Händel, et al., (2020)** in Germany reported that students who were ready for online learning expressed less tension, worries, and overload and in the study of **Kabir et al., (2021)** in Bangladesh students with sub-optimal readiness was significantly associated with moderate to high level of perceived online learning stress. However, the study of **Moy& Ng, (2021)** in Malaysia found e-learning perception to be not associated with stress. This variation may be related to the implementation of e-learning by some universities prior the COVID-19 pandemic.

Unexpectedly, despite more than half of gerontological nursing students had a positive e-learning perception, they had moderate stress level from e- learning. One explanation may be due to the sudden overwhelming online academic sessions and assignments in addition to the social apprehension of deadly disease and the outbreak of COVID-19 **(Mortagy et al., 2022).** An additional explanation may be related to fears that students tolerate due to uncertainty about their grades and issues regarding graduation as supported by **Sahu, (2020)** who highlighted fear issues in university students. Also, increased stress level observed in this study might be resulted from sudden new learning method installation. **Kabir et al., (2021)** in Bangladesh highlights that many learners may not prefer to be ready for introducing a new learning method. So that, it is premature and unfair to judge online nursing learning given these circumstances and this may be explored in subsequent studies.

Students all over the world are experiencing stress resulting from many academic and non-academic aspects such as environmental, psychological, social, and cultural factors **(Chandra, 2020)**. The results indicate that the effect of the pandemic on nursing students is multidimensional. The COVID-19 has led to unprecedented changes

in the academic learning, work environments, and personal lives of nursing students in all regions COVID-19 has resulted in unprecedented changes in working environments and academic learning and personal lives of nursing students in all regions **Emory et al., (2021).**

Conclusion

More than half of gerontological nursing students had moderate stress and positive perception towards online learning. Level of stress and perception towards online learning may depend on several factors including, sex, GPA, parents' educational level, and family income, In addition a strong negative correlation was found between perception towards online learning and perceived stress of gerontological nursing students. Furthermore, more than half of gerontological nursing students were satisfied about online learning and, more than two thirds of them reported that online learning should be continued during this pandemic.

Recommendations

1. Training programs should be conducted to nursing students about using online learning platforms to improve their self-confidence in using it.
2. Further research to identify online learning barriers from the faculty members' perspective is needed.
3. Interventional studies should be conducted to show the effect of online learning on academic achievements.
4. Develop strategy to overcome online challenges.

Limitation:

There are several limitations to the study. The study sample was small and included only gerontological nursing students of Mansoura University which may limit the generalizability of the findings. Also, an online assessment may entail data of a lower quality than that obtained by face-to-face interviews. Finally, the cross sectional design of the study has a limitation in determining a causal relationship.

ACKNOWLEDGEMENTS:

The author would like to express appreciation to all students who participated in the study for their time, effort, and contributions. The authors declare that they have no conflict of interest. All data including statistics are available from the corresponding author and will be made available upon reasonable request.

Financial support:

No funding was received

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