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Personal factors affecting perception of distance learning of nursing curriculum among nursing students during COVID-19 pandemic

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ABSTRACT

Background: Many factors affect the perception of e-learning among nursing students during COVID-19 pandemic. Among which personal characteristics play a cruciate role.
Methods: A questionnaire was sent online to all registered nursing students during the academic year 2019/2020. It included beside the general characteristics, 6 domains related to perception of distance learning. Each domain included a number of questions (items). Each item has 5 points Likert-scale (responses) starting from 4 for the highest positive perception and 0 for lowest negative perception. Score ≥ 75 was considered as positive perception whereas score < 75 was considered as negative perception. Association between personal factors and negative perception was tested using Chi square test and multiple logistic regression analysis.
Results: Older age of the nursing students was associated with negative perception of the first (OR = 1.20, CIs: 1.06 – 1.36), fifth (OR = 1.21, CIs: 1.10 – 1.37) and sixth (OR = 1.21, CIs: 1.10 – 1.38) domains. Also, being a female student was associated with negative perception of the fourth domain (OR = 3.88, CIS: 1.88 – 8.00). Working beside the nursing study seemed to be a protective factor against negative perception for the first (OR = 0.21, CIs: 0.08 – 0.61), fifth (OR = 0.23, CIs: 0.08 – 0.65) and sixth (OR = 0.16, CIs: 0.06 – 0.47) domains. Being in the third academic year was proved to be a protective factor against negative perception of the second (OR = 0.31, CIs: 0.11 – 0.91) and third (OR = 0.25, CIs: 0.09 – 0.69) domains.
Conclusion: Overall, older age of nursing students was associated with negative perception of e-learning (OR = 1.17, CIs: 1.20 – 1.34) whereas working beside the study was associated with positive perception (OR = 0.17, CIs: 0.07 – 0.60).

INTRODUCTION:

Since COVID-19 has been defined as a pandemic disease and lockdown started worldwide, and to ensure safety of students and educators, most of the educational institutes have been converted to distance learning. (Harvard Medical School, 2020) The educational establishment in Kuwait is not different including Nursing Institute. Thus, the educational system is shifting toward a new system of online teaching and examination. (Sandhu and de Wolf, 2020) As we experienced a massive transition to online learning, it was extremely important to study the effects of online learning on nursing students knowing that practical

courses need direct interaction for the purpose of practice. On the contrary, basic science courses are more flexible to be converted to online as it needs a minimal real-time interaction between the lecturer and the students.

E-learning has been defined as “an educational method that facilitates learning by the application of information technology and communication providing an opportunity for learners to have access to all the required education programs”. (Golband et al., 2014) Although distance learning is not a new concept in many countries, it was not considered as a main teaching resource in Kuwait. Thus, many challenges emerged as a result for administrative and teaching staff, but more to the students. To develop an e-learning experience, it is necessary to have good knowledge regarding specific elements of e-learning, educational methods and individual characteristics of the attendants. The aim of the present study is to identify personal factors that could affect perception of distance learning of nursing course among nursing students during Covid-19 pandemic

SUBJECTS AND METHODS:

Settings:

Nursing institute is one of the structures of the public Authority for Applied Education and Training in Kuwait. Nursing student should pass through a preparatory course and 3 academic years. The total number of nursing students in the academic years during 2019/2020 was 420. All of them were invited to participate in the present study after performing their examination though an online questionnaire.

Study design:

An observational cross-sectional study design was adopted for this study. Data of this study was collected through an online specially designed questionnaire that was sent to all registered nursing students during the academic year 2019/2020. This questionnaire consisted of two sections. The first section dealt with general characteristics, including age, sex, marital state, academic years, presence of job beside studying. The second section include 6 domains related to “perception of distance learning: experience in general” (7 items), “course structure and contents” (8 items), “examination and evaluation” (7 items), “ease and speed” (3 items), “multimedia” (5 items) and “interactivity” (4 items). Each item has 5 points Likert-scale (responses) starting from 4 for the highest positive perception and 0 for lowest negative perception. High score indicated positive perception of the domain of distance learning.

Total score for each domain was transformed into percentage score calculated as sum of items scores multiplied by 100 / number of items under the specific domain. The sum was treated to yield a range of 100% with a minimum of zero and a maximum of 100. For each domain, as well as the total, score less than 75% was considered as negative perception whereas score ≥ 75% was considered as positive perception.

A pilot study was carried out on 10 nursing students. All the necessary approvals for carrying out the research were obtained.

Statistical analysis:

The questionnaire was tested for its reliability. Crunbach’s alpha were 0.80, 0.79, 0.63, 0.93, 0.88 and 0.78 for the studied 6 domains. Simple descriptive statistics as number and percentage distribution for categorical variables and mean with the standard deviation for the age were used. To detect association between domain score (high and low) and personal factors, analysis was initially carried out based on a series of univariate comparisons using Chi-square test. In order to control simultaneously for possible confounding effect of the variables, multiple logistic regression was used for the final analysis whereas the association between personal factors and outcome of interest (low score) was expressed in terms of odds ratios (OR) together with their 95% confidence intervals (95% CI).

RESULTS:

The final analysis was performed on 146 nursing students. Table 1 shows the general characteristics of the participating students. Their age ranged from 18 to 35 years with a mean 24.9 ± 3.7 years old. Males constituted 44.5% versus 55.5% for females. Just above half of them were single (56.2%) and 43.8% ever married. A fifth of them had an additional job beside their study. Regarding their academic year, 17.1%, 22.6% and 60.3% were in the first, second and third year respectively.

Table 2 shows the distribution of participating nursing students according to their sociodemographic characteristics and their curriculum domains perception scores.

Regarding first domain (experience in general), student in the age group ≥ 25 years were more liable to have negative perception (64.1%) compared with those with positive perception (31.0%) significantly ($p = 0.002$). Also, a lower proportion of students who practiced a job beside the study had negative perception (16.2%) than those with positive perception (34.5%) significantly ($p = 0.03$).

As regards the second domain (examination and evaluation), the majority of students with positive perception were in the third academic year (86.7%) as compared with those with negative perception (48.5%) significantly ($p < 0.001$). The same pattern was observer for the third domain (course structure and contents) (84.5% versus 44.3%. $p < 0.001$)

For the fourth domain (ease and speed), 66.7% of students with negative perception were female as compared with 34.0% in the positive perception group significantly, $p < 0.001$.

The fifth (multimedia) and sixth (interactivity) domains as well as the overall score showed the same pattern whereas students in the age group ≥ 25 years old were associated with negative perception significantly ($p < 0.001$, 0.01 and 0.01 respectively) while those who have another job beside their study were associated with positive perception ($p = 0.05$, 0.05 and 0.03 respectively)

Table 3 shows the adjusted odd ratio and its 95% confidence limits of significant predictors of negative perception of the curriculum domains. Overall, older age of students was proved to be significantly associated with negative perception (OR = 1.17, CIs: 1.20 – 1.34), whereas having a job beside study was significant a protective factor against negative perception (OR = 0.20, CIs: 0.07 – 0.60).

Analysis of associated factors with individual domains showed that the age was a risk factor for negative perception in the first, fifth and sixth domains (OR = 1.20, CIs: 1.06 – 1.36), (OR = 1.21, CIs: 1.10 – 1.37) and (OR = 1.21, CIs: 1.10 – 1.38). Being a female student was associated with negative perception regarding the fourth domain (OR = 3.88, CIs: 1.88 – 8.00). Having a job beside the study was significantly protective against negative perception in the first, fifth and sixth domains (OR = 0.21, CIs: 0.08 – 0.61), (OR = 0.23, CIs: 0.08 – 0.65) and (OR = 0.16, CIs: 0.06 – 0.47). Also, being in the third academic year was a protective factor against negative perception as compared with being in the first year in the second (OR = 0.31, CIs: 0.11 – 0.91) and third (OR = 0.25, CIs: 0.09 – 0.69) domains.

Table (1): Socio-demographic characteristics of the participating nursing students

Characteristic	Number	%
Age		
<25	62	42.5
≥ 25	84	57.5
Mean ± SD	24.9 ± 3.7	
Sex		
Males	65	44.5
Female	81	55.5
Marital status:		
Single	82	56.2
Ever married	64	43.8
Academic year		
First	25	17.1
Second	33	22.6
Third	88	60.3
Job beside study		
No	117	80.1
Yes	29	19.9
Total	**146**	**100.0**

Table (2): Distribution of participating nursing students according to sociodemographic characteristics and their e-learning curriculum domains perception *

Character	Domain 1		Domain 2		Domain 3		Domain 4		Domain 5		Domain 6		Overall	
	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve
Age														
<25	20 (69.0)	42 (35.9)	20 (44.4)	42 (41.6)	23 (39.7)	39 (44.3)	27 (54.0	35 (36.5)	24 (68.6)	38 (34.2)	19 (65.5)	43 (36.8)	16 (66.7)	46 (37.7)
≥ 25	9 (31.0)	75 (64.1)	25 (55.6)	59 (58.4)	35 (60.3)	49 (55.7)	23 (46.0)	61 (63.5)	11 (31.4)	73 (65.8)	10 (34.5)	74 (63.2)	8 (33.3)	76 (62.3)
P value	0.002		0.87		0.58		0.05		<0.001		0.01		0.01	
Sex														
Male	16 (55.2)	49 (41.9)	25 (55.6)	40 (39.6)	24 (41.4	41 (56.6)	33 (66.0)	32 (33.3)	20 (57.1)	45 (40.5)	15 (51.7)	50 (42.7)	13 (54.2)	52 (42.6)
Female	13 (44.8)	68 (58.1)	20 (44.4)	61 (60.4)	34 (58.6)	47 (53.4)	17 (34.0)	64 (66.7)	15 (42.9)	66 (59.5)	14 (48.3)	67 (57.3)	11 (45.8)	70 (57.4)
P value	0.22		0.08		0.54		<0.001		0.12		0.41		0.37	
Marital status														
Single	21 (72.4)	61 (52.1)	26 (57.8)	56 (55.4)	29 (50.0)	53 (60.2)	32 (64.0)	50 (52.1)	25 (71.4)	57 (51.4)	20 (69.0)	62 (63.0)	16 (66.7)	66 (54.1)
Ever married	8 (27.6)	56 (47.9)	19 (42.2)	45 (44.6)	29 (50.0)	35 (39.8)	18 (36.0)	46 (47.9)	10 (28.6)	54 (48.6)	9 (31.0)	55 (47.0)	8 (33.3)	56 (45.9)
P value	0.06		0.56		0.24		0.22		0.50		0.15		0.37	
Job beside study														
No	19 (65.5)	98 (83.8)	32 (71.1)	85 (84.2)	43 (74.1)	74 (84.1)	34 (68.0)	83 (86.5)	24 (68.6)	93 (83.8)	18 (62.1)	99 (84.6)	15 (62.5)	102 (83.6)
Yes	10 (34.5)	19 (16.2)	13 (28.9)	16 (15.8)	15 (25.9)	14 (15.9)	16 (32.0)	13 (13.5)	11 (31.4)	18 (16.2)	11 (37.9)	18 (15.4)	9 (37.5)	20 (16.4)
P value	0.03		0.07		0.14		0.01		0.05		0.01		0.03	
Academic year														
First	5 (17.2)	20 (17.1)	5 (11.1)	20 (19.8	6 (10.3)	19 (21.6)	8 (16.0)	17 (17.7)	7 (20.0)	18 (16.2)	5 (17.2)	20 (17.1)	4 (16.7)	21 (17.2)
Second	3 (10.3)	30 (25.6)	1 (2.2)	32 (31.7)	3 (5.2)	30 (34.1)	9 (18.0)	24 (25.0)	7 (20.0)	26 (23.4)	6 (20.7)	27 (23.1)	2 (8.3)	31 (25.4)
Third	21 (72.4)	67 (57.3)	39 (86.7)	49 (48.5)	49 (84.5)	39 (44.3)	33 (66.0)	55 (57.3)	21 (60.0)	67 (60.4)	18 (62.1)	70 (59.8)	18 (75.0	70 (57.4)
P value	0.19		<0.001		<0.001		0.55		0.84		0.96		0.16	

*: Number (%)

Table (3): Adjusted odd ratio and its 95% confidence limits of significant predictors of low scores perception of e-learning curriculum domains

Variables	Domain 1		Domain 2		Domain 3		Domain 4		Domain 5		Domain 6		Total	
	OR	95% CIs	OR	95% CIs	OR	95% CIs	OR	95% CIs	OR	95% CIs	OR	95% CIs	OR	95% CIs
Age	1.20	(1.06 –1.36)	NS		NS		NS		1.21	(1.10 –1.37)	1.21	(1.10 –1.38)	1.17	(1.20 – 1.34)
Sex														
Male[R]	NS		NS		NS		1		NS		NS		NS	
Female							3.88	(1.88 – 8.00)						
Other job														
No [R]	1		NS		NS		NS		1		1		1	
Yes	0.21	(0.08 –0.61)							0.23	(0.08–0.65)	0.16	(0.06 –0.47)	0.20	(0.07 –0.60)
Civil status														
Single [R]	NS		NS		NS		NS		NS		NS		NS	
Ever married														
Academic year														
First [R]	NS		1		1		NS		NS		NS		NS	
Second			8.00	(0.87 –73.00)	3.16	(0.70 –14.16)								
Third			0.31	(0.11 – 0.91)	0.25	(0.09 – 0.69)								

[R] = Reference category, OR = Odds ratio, CIs = Confidence intervals NS = Not significant

DISCUSSION:

With the wide use of technology in today's learning environment, we should not anymore be concerned with finding out which is better, face-to-face or technology-enhanced instruction. Our primary goal should be whether students really learn with the intervention of online learning tools and the variables that contribute to the success of online learning process. (Kira and Saade, 2006) The current study revealed that there is a variety of preferences on the different domains of a nursing on-line curriculum. Since there are multiple user control features in the interactive on-line methods, it remains clear that multiple parameters will interact to affect the perception of the participants about the quality and effectiveness of such type of learning. Consistent with other studies; this study about the detailed domains of a nursing on-line curriculum revealed that sociodemographic characteristics of nursing students play an important role about quality of on-line learning.(Sindiani et al., 2020; Pei and Wu, 2019)

The results of the current study revealed that younger nursing students tended to significantly score high (positive perception) for the overall evaluation of the nursing curriculum as well as the "course expectation in general", "multimedia" and "interactivity" domains. Younger people tend to be more proactive in using technologies in their learning, which is most likely due to their earlier contact with technology and also to the way they perceive the technology as an instrument both for entertainment and learning. (Forsyth et al., 2018) Also, younger age students might have been exposed to digital technological learning during their high school while the older ones could not catch such opportunity. The findings of the current study are inconsistent with other studies that did not find a significant difference between age and overall on-line courses. (Colorado and Eberle, 2010; Martí´nez-Caro et al., 2011) The observed differences between this study from one side and the other studies dealing with the impact of age on on-line learning might be attributed to different study designs, outcome measures, used technologies, and different fields of training courses and populations.

Although the sum of all the learning domains did not differ significantly between male and female students, yet males had significantly higher scores on the "pace and speed domain". Reviewing the literature revealed inconsistent results. Some studies showed that male students had more positively perception towards e-learning than female students, (Liaw and Huang, 2011) while others reported that females were more liable to deal with communication technologies and accept information than males. (Egbo et al., 2011) However, some other studies did not show significant difference between attitude scores for male and female. Suri and Sharma (2013) in his study, reported that no gender difference regarding the perception of e-learning which goes with many recent studies which showed that the gap between male and female in this issue is narrowing. (Bhattacharjee, 2021)

The current findings revealed that no overall significant differences were related to the academic year of the nurse students. However, some individual domains specifically "structure and content" and "examination and evaluation" were significant predictors of high score for the students in the third academic year (most senior students) compared with those in the first academic year (most junior students). This is inconsistent with another study that revealed a better students' perceptions of e-learning in university education among junior students. (Yacoba et al., 2012) However, the later students experienced using e-learning in secondary schools, while senior nursing students of the current study may tend to have been employed. Few references dealt with the impact of employment of nursing students on on-line learning curriculum. The current study revealed that working student nurses tended to have a high score on the overall curriculum as well as "course expectations in general", "multimedia" and "interactivity" domains of the curriculum. This confirms the results shown in other studies that used different sample population and different learning contents. (Forsyth et al., 2018) Multiple reasons can explain this finding. The employed students have a greater need of distance education and it would respond to their needs in greater extent than to the needs of unemployed students as they have both more social and personal commitments. Also, the flexible conditions that online distance education creates for combining studying with work and personal engagements. (Forsyth et al., 2018)

It seems reasonable to develop an e-learning nursing or other curricula by considering the significant sociodemographic factors affecting on-line learning revealed by this study. Thus, age, employment, academic year as well as gender should be taken into account to have a successful and effective e-learning program. One limitation of the study is the cross-sectional design that is based on an on-line questionnaire with the low response rate that may affect generalization of the findings. Another limitation is concerned with the predictor variables of nursing student perception of distance learning, as only personal factors were studied. Further research studies are recommended to include more factors that could be associated.

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