



Review article

Online learning experiences among nursing and midwifery students during the Covid-19 outbreak in Ghana: A cross-sectional study

Hammond Yaw Addae^{a,*}, Afizu Alhassan^a, Shirley Issah^a, Fusta Azupogo^b^a Nursing & Midwifery Training College, Kpembe, Box SL 98, Salaga, Ghana^b Department of Family and Consumer Sciences, Faculty of Agriculture, Food and Consumer Sciences University for Development Studies, Box TL 1882, Tamale, Ghana

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ABSTRACT

As a result of the COVID-19 pandemic, schools in Ghana were compelled to suspend routine learning activities and shut down to avert a possible public health crisis. As such, online learning was introduced as a temporary measure to ensure continuity in learning. For nursing and midwifery students who are usually more engaged in face-to-face practical learning, it will be interesting to ascertain how they experienced online learning during the COVID-19 pandemic in a technologically deprived country. Hence, data was collected from March to June 2021 using online methods and a cross-sectional study design among students of nursing and midwifery training colleges in the five regions of Northern Ghana. Logistic regression and descriptive analysis were conducted using SPSS (version 22) to determine the association between (1) socio-demographic factors, (2) internet exposure and accessibility factors, and the outcome variable; students' experiences. The results for 318 students revealed that pleasant experiences were below average (42.8%) and that reliable college internet connectivity, older age, year of study, and residence in southern Ghana were significant predictors of pleasant experiences. However, high cost of data and home distractions were identified as the main challenges to online learning. Therefore, it is important for nursing and midwifery training colleges in northern Ghana to establish robust information and communication technology infrastructure on their campuses to ensure reliable internet connectivity.

1. Introduction

All aspects of human life were significantly disrupted by the COVID-19 pandemic including the teaching and learning environment (Schleicher, 2020). As a result of this public health crisis, educational systems were compelled to suspend routine learning activities and shut down. This closure of educational institutions affected about 1.6 billion students in 190 countries globally including Ghana (Nations United, 2020).

In Ghana, the first two (2) COVID-19 cases were detected on March 12, 2020, and by March 31st, 2020 the number had risen to 161 cases (Johns Hopkins University, 2021; Kenu et al., 2020) compelling the government to urgently develop strategies to avert a potential public health crisis. Accordingly, in mid-March 2020, the government announced several restrictions to stem the spread of the virus. One of these measures was the temporary closure of all schools in Ghana (Kokutse, 2020) and the lockdown of some major cities (Ghana Health Service, 2020; Kenu et al., 2020). This unexpected shutdown of schools compelled school authorities to implement online Teaching and Learning

(T&L) strategies to enable students complete the rest of their syllabus. Online learning was introduced in schools as a temporary measure to ensure continuity in learning activities, particularly because there was great uncertainty surrounding the pandemic and when it might end. Therefore, the conventional face-to-face T&L was substituted for online learning in all schools including nursing training colleges.

The transition from classroom learning to online was made possible because of recent advances in technology, which has transformed the way people connect and communicate (Alhadlaq, 2016). About a decade ago, online T&L was not possible in developing countries (Sife et al., 2007). However, with the advent of faster internet, smart mobile devices and computers, together with numerous social media and online T&L platforms, online T&L is now a feasible approach to education in many countries (Stuart, 2019).

In the Ghanaian context, even before the outbreak of the COVID-19 pandemic, some universities delivered some courses/programs online (Darkwa and Antwi, 2021) and this motivated other educational institutions to embrace the online learning initiative during the pandemic. However, for many students and teachers, online learning was a

* Corresponding author.

E-mail addresses: addae@kpmbenmtc.edu.gh, hamondd@yahoo.com (H.Y. Addae).

first-time experience (Ogbonnaya et al., 2020). The advances in technology notwithstanding, online learning was expected to be accompanied by some challenges such as high cost of internet data, interferences at home during learning, and inadequate capacity to teach, evaluate, and assess students using only online methods (Ogbonnaya et al., 2020). There are several approaches to online learning but to ensure strict all-inclusive attendance and be able to replicate the classroom environment, with real-time simultaneous online interactions, the synchronous online learning method (Lim, 2017) was adopted by colleges during the pandemic in Ghana. Such a method allowed students to ask questions and receive instant responses from tutors during lectures.

Given that online learning was a relatively new experience for many students in Ghana, it became imperative to evaluate the experiences of the students who participated in the online learning to suggest better alternatives and influence policy in the future. Some studies have assessed experiences and perceptions of students on online learning during COVID-19 and these studies were primarily conducted in high-income countries (Gallagher-Mackay et al., 2021; Linley, 2020; Mccawey et al., 2021). In developing countries such as Ghana, research on students' experiences with online learning has mostly been conducted among students from other disciplines like pre-service teacher education (Ogbonnaya et al., 2020), linguistics (Tabiri et al., 2022), engineering (Sarpong et al., 2022), and vocational education (Henaku, 2020).

To the best of our knowledge, a quantitative study to investigate the experiences of nursing and midwifery students with online learning during the COVID-19 outbreak is a novelty in the context of Ghana. The present study is also unique and important because it focuses on nursing and midwifery students who are usually more engaged in practical learning. Therefore, it will be interesting to ascertain how they experienced online learning, which for many was a first-time experience. This study therefore aimed to explore the experiences of nursing and midwifery students with online learning during the COVID-19 break in Northern Ghana.

1.1. Research questions

The study would answer the following three questions.

1. What is the overall rating for the online learning experiences among nursing and midwifery students during the COVID-19 break in Ghana?
2. What factors predicted pleasant online learning experiences in the context of the COVID-19-induced break in Ghana?
3. What challenges did nursing and midwifery students encounter with online learning during the COVID-19-induced break in Ghana?

2. Materials and methods

2.1. Study design

This was a descriptive cross-sectional survey that employed quantitative methods for data collection and analysis.

2.2. Population and sampling

Students from Nursing and Midwifery Training Colleges (NMTC) in Northern Ghana constituted the population. The total population of students from the five northern Ghana regions was 5152 students (Ghana Nursing and Midwifery Council, 2021). However, first-year students were excluded from the study because they had not participated in the online learning initiative during the COVID-19 outbreak. Students in their second and third years of studies and those who completed their studies in 2020 were invited to participate. These cohorts of students had all participated in online learning during the COVID-19 outbreak to overcome disruptions in their academic programs caused by the COVID-19 pandemic. Participants were recruited using convenience

sampling method, which means students were not randomly or systematically selected, rather those who were readily available and willing to participate were selected.

2.3. Sample size

The sample size for this study was guided by the Cochran formula (Cochran, 1977) which is expressed as:

$$n = \frac{Z^2 * p(1 - p)}{E^2}$$

where n = sample size, p = prevalence of satisfaction with online learning experience in Ghana (Ogbonnaya et al., 2020) = 72.0%. E = margin of error/precision = 5 % = 0.05. Z = the standard normal deviation for a 95% confidence interval = 1.96

$$n = \frac{(1.96)^2 * (0.72)(1 - 0.72)}{(0.05)^2} = 271$$

Therefore, the minimum sample size was 271 students. However, the minimum sample requirement was increased by 20% to compensate for anticipated attrition and this increased the sample size to 325 students.

2.4. Data collection instrument

A structured questionnaire developed by the authors was used to collect the data. The questionnaire consisted of four sections designed to capture information about participants' background characteristics and experiences of online learning. Questionnaire development was guided by relevant literature review and the objectives of the study.

Section A contained questions about participants' demographic and other background characteristics such as age, sex, marital status, household wealth, regional location of College and program of study. Section B contained factors that are considered as challenges to online learning in the literature, for example, home obligations/distractions, boring lectures, unfamiliar mediums, and unstable internet connectivity. Participants were to choose all factors they considered as challenges to online learning. Section C consisted of questions regarding participants' exposure and access to the internet and previous experience of online learning. Section D was a validated questionnaire adapted with permission from the authors, Sasmal and Roy (2021). Sasmal and Roy (2021) used that questionnaire to assess nursing students' experiences and perceptions of online learning in India. The questionnaire was modified by excluding questions that did not apply to the Ghanaian context. The modified version of the questionnaire contained 14 positively-worded items that assessed the overall experiences or perceptions of students regarding online learning in Ghana. Each item was scored on a five-point Likert scale: Strongly agree, agree, neutral, disagree, and strongly disagree. The Cronbach's alpha for this section of the tool was 0.861, suggesting a strong indicator of internal consistency and reliability.

To ensure the content validity of the instrument, it was reviewed by a panel of five experts who had at least five years' experience in online learning design and implementation. Their inputs were used to add more clarity to some items. Additionally, the questionnaire was piloted among 20 nursing and midwifery students attending Colleges in the southern part of Ghana who were not part of the study population. The results of the pilot test also contributed to the further refinement of the questionnaire.

2.5. Data collection procedure

The study questionnaire was incorporated into a google form survey link and distributed to all potential participants via WhatsApp messenger as previously done (Aboagye et al., 2020; Mccawey et al., 2021). The use of an online survey for data collection was necessitated by COVID-19 restrictions. The survey link was first sent to participants in the first

Table 1. Background characteristics of respondents (N = 318).

Variable	Frequency (n)	Percentage (%)
Age in years (mean + -SD age: 23.63 ± 2.45)		
16 to 20	15	4.7
21 to 25	254	79.9
26 +	49	15.4
Sex		
Male	101	31.8
Female	217	68.2
Marital Status		
Not Married	274	86.2
Married	44	13.8
Religion		
Christian	205	64.5
Moslem	113	35.5
Household Wealth		
Low	205	64.4
Medium	94	29.6
High	19	6.0
Sleep in the same room		
Alone	89	28.0
1 other Person	83	26.1
2 other people	51	16.0
3 other people	37	11.6
4 other people	43	13.5
5 + people	15	4.7
Region of Residence		
Northern Zone	172	54.1
Southern Zone	116	36.5
Coastal Zone	30	9.4
Location of College		
North East	24	7.5
Northern	68	21.4
Savannah	137	43.1
Upper East	61	19.2
Upper West	28	8.8
Program of study		
Nurse Assistant Clinical/Nurse Assistant Preventive	89	28.0
Registered General Nursing	115	36.2
Registered Midwifery	85	26.7
Others (Registered Mental Health Nursing, Registered Community Health Nursing, Post Nurse Assistant Clinical or Post Nurse Assistant Preventive)	29	9.1
Program qualification		
Certificate	89	28.0
Diploma	229	72.0
Current year of study		
Second Year	117	36.8
Third Year	105	33.0
Completed in 2020	96	30.2

week of March 2021, then bi-weekly reminders were sent to participants until the end of June 2021 when no new surveys were forthcoming and the submitted questionnaires were more than the minimum sample size. Completed surveys were collated and the data extracted from google forms into SPSS version 22 for statistical analysis.

2.6. Quality control measures

In this present study, the STROBE checklist (von Elm et al., 2007) for cross-sectional studies was used as a guide to ensure conformity to

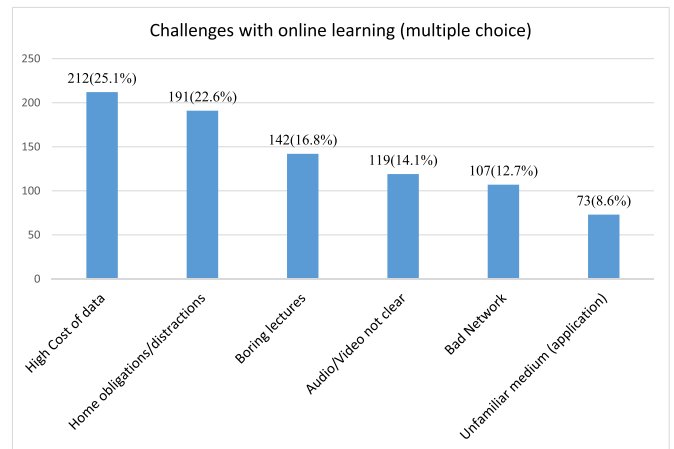


Figure 1. Challenges with online learning among nursing and midwifery students during the COVID-19 break (multiple choice).

recommended standards of conducting and reporting observational studies. Also, to eliminate the likelihood of multiple responses by respondents, the questionnaire was restricted to be completed only once by each participant.

2.7. Statistical analysis

Descriptive statistics in the form of frequencies and percentages were used to summarize data about the background characteristics of participants. A bar graph was used to display the results of challenges with online learning. Chi-square tests were conducted to determine the association between background characteristics, online and internet factors, and the outcome variable (satisfaction of students with online learning experiences). Satisfaction with online learning was determined using scores from the “Experience with Online Learning Scale”. The mean experience score was 2.39 (range of scores: 1–5). A score above the mean satisfaction score indicates a pleasant experience with online learning while a score equal to or below the mean indicates unpleasant experience with online learning (Thapa et al., 2021). The principal components analysis method (Filmer and Pritchett, 2001) was used to estimate household wealth based on household assets.

To account for the effects of independent variables on each other and determine the direction and magnitude of variables in relation to the outcome variable (pleasant and unpleasant experience); variables with p-values less than 0.25 (Hosmer and Lemeshow, 2004) at the univariate level were included in a multiple Logistic Regression (LR) model using Backward LR. Variables with p-values less than 0.05 at 95% confidence interval were deemed statistically significant at the final step.

2.8. Ethical considerations

The study was reviewed by the Research and Ethics Committee of Kpembe Nursing and Midwifery Training College which considered it as low risk research and exempted it from human ethics approval because the study involved only an online survey of participants. However, the college granted permission for the study to be conducted. Permission to access students' WhatsApp numbers was also granted by the Principals of the participating schools. A click on the google forms link directed students to the Plain Language Statement and Consent page. This page provided students with a clear description of the survey objectives and scope and participants' rights to confidentiality, anonymity and voluntary participation/exit. Participants were required to indicate their consent before they could proceed to complete the survey. Privacy of data was also strictly adhered to throughout the study.

Table 2. Individual item analysis of the “experience with online learning scale”.

Statements	Strongly disagree/disagree n (%)	Not sure n (%)	Agree/strongly agree n (%)	Mean/SD
All experiences on online learning during COVID-19 break	2727 (61.2)	537 (12.1)	1188 (26.7)	2.39 ± 0.72
1. I had clinical interactions with patients during online learning	217 (68.2)	70 (22.0)	31 (9.7)	2.06 ± 1.02
2. It's easy to have group discussions during online learning	199 (62.6)	45 (14.2)	74 (23.3)	2.36 ± 1.16
3. I enjoyed interactions with tutors during online learning	151 (47.5)	55 (17.3)	112 (35.2)	2.72 ± 1.21
4. I did not feel anxious during online learning sessions	102 (32.1)	48 (15.1)	168 (52.8)	3.15 ± 1.25
5. Online learning helped me to understand both theory & practical sessions better than classroom lessons	254 (79.9)	27 (8.5)	37 (11.6)	1.78 ± 1.06
6. I found online learning sessions convenient than classroom lessons	261 (82.1)	29 (9.1)	28 (8.8)	1.80 ± 1.03
7. I always attended online classes without fail	205 (64.5)	24 (7.5)	89 (28.0)	2.46 ± 1.23
8. I felt tutors were trained well before conducting E-learning sessions	126 (39.6)	74 (23.3)	118 (37.1)	2.86 ± 1.32
9. Online learning enhanced speedy completion of the syllabus.	155 (48.7)	45 (14.2)	118 (37.1)	2.74 ± 1.38
10. We had no internet challenges during online learning	132 (41.5)	7 (2.2)	179 (56.3)	3.25 ± 1.68
11. I will prefer online learning to traditional classroom learning	261 (82.1)	13 (4.1)	44 (13.8)	1.85 ± 1.14
12. I did not feel increased eye strains due to online learning sessions	149 (46.9)	60 (18.9)	109 (34.3)	2.71 ± 1.21
13. Online learning is cheaper compared to classroom learning.	262 (82.4)	28 (8.8)	28 (8.8)	1.69 ± 0.98
14. It was easy for me to acquire communication equipment for online learning.	253 (79.6)	12 (3.8)	53 (16.7)	1.98 ± 1.13

Prevalence of respondents with score >2.39 = 42.8% (95% C.I = 37.3–48.2).

3. Results

3.1. Background characteristics of respondents

Out of the 325 students that were expected to respond to the questionnaire, 320 were received. Upon review, 318 questionnaires remained for further analysis. [Table 1](#) contains the socio-demographic and other background characteristics of respondents. The majority (79.9%) of the respondents were aged 21 to 25 with a mean age of 23.63 ± 2.45 years. There were more females (68.2%) than males (31.8%) with the majority reporting as not married (86.2%) and Christian (64.5%). More than half (54.1%) of respondents were resident in the Northern zone with 2 out of 5 having their college located in Savannah region. Majority (72%) of respondents offered a diploma program and they were evenly spread across the three-year groups i.e. 36.8%, 33.0% and 30.2% for second year, third year and completed in 2020 respectively.

3.2. Challenges with online learning

High cost of data and home obligations/distractions were identified as the two most common challenges to online learning with a prevalence of 25.1% and 22.6% respectively. Unfamiliar medium/application was identified as a challenge by only 8.6% of respondents, making it the least challenge to online learning; it was selected the least number of times as compared to other challenges ([Figure 1](#)).

3.3. Nursing and midwifery students' satisfaction with online learning experience

Based on cut-off values from the “Experience with Online Learning Scale”, 136 students (42.8%) were satisfied with their online learning experience while 182 (57.2%) were dissatisfied.

Further details of how students responded to the individual items on the experience scale are presented in [Table 2](#).

3.4. Association between background characteristics and satisfaction of students with online learning

Satisfaction with online learning experience was categorised as pleasant or unpleasant ([Thapa et al., 2021](#)). Out of the 318 respondents, 182 (57.2%) had unpleasant experience while 136 (42.8%) had pleasant experience.

As illustrated in [Table 3](#), the outcome variable of pleasant and unpleasant experience were significantly different (at $p < 0.05$) among program of study ($\chi^2 = 15.54$, $p = 0.01$), program qualification ($\chi^2 = 9.08$, $p = 0.03$), current year of study ($\chi^2 = 14.79$, $p = 0.01$) and whether respondents passed licensure exams or not ($\chi^2 = 14.92$, $p < 0.01$). However, no such significant differences were observed among the participants based on their marital status, religion and household wealth.

Table 3. Association between background characteristics of participants and their experiences with online learning.

Variable	Unpleasant Experience: n (%)	Pleasant Experience: n (%)	Chi-square, p-value
	182 (57.2)	136 (42.8)	
Age (years)			
16 to 20	10 (66.7)	5 (33.3)	$\chi^2 = 3.94, p = 0.140$
21 to 25	150 (59.1)	104 (40.9)	
26 +	22 (44.9)	27 (55.1)	
Sex			
Male	63 (62.4)	38 (37.6)	$\chi^2 = 1.97, p = 0.172$
Female	119 (54.8)	98 (45.2)	
Marital Status			
Not Married	159 (58.0)	115 (42.0)	$\chi^2 = 0.51, p = 0.474$
Married	23 (52.3)	21 (47.7)	
Religion			
Christian	113 (55.1)	92 (44.9)	$\chi^2 = 1.05, p = 0.305$
Moslem	69 (61.1)	44 (38.9)	
Household Wealth			
Low	121 (59.0)	84 (41.0)	$\chi^2 = 2.21, p = 0.462$
Medium	49 (52.1)	45 (47.9)	
High	12 (63.2)	7 (36.8)	
Sleep in the same room			
Alone	53 (59.6)	36 (40.4)	$\chi^2 = 6.28, p = 0.280$
1 other Person	49 (59.0)	34 (41.0)	
2 other people	31 (60.8)	20 (39.2)	
3 other people	24 (64.9)	13 (35.1)	
4 other people	18 (41.9)	25 (58.1)	
5 + people	7 (46.7)	8 (53.3)	
Region of Residence			
Northern Zone	108 (62.8)	64 (37.2)	$\chi^2 = 5.28, p = 0.071$
Southern Zone	57 (49.1)	59 (50.9)	
Coastal Zone	17 (56.7)	13 (43.3)	
Location of College			
North East	11 (45.8)	13 (54.2)	$\chi^2 = 6.55, p = 0.162$
Northern	43 (63.2)	25 (36.8)	
Savannah	76 (55.5)	61 (44.5)	
Upper East	40 (65.6)	21 (34.4)	
Upper West	12 (42.9)	16 (57.1)	
Program of study			
Nurse Assistant Clinical/Nurse Assistant Preventive	39 (43.8)	50 (56.2)	$\chi^2 = 15.54, p = 0.01$
Registered General Nurse	80 (69.6)	35 (30.4)	
Registered Midwifery	44 (51.8)	41 (48.2)	
Others	19 (65.5)	10 (34.5)	
Program qualification			
Certificate	39 (43.8)	50 (56.2)	$\chi^2 = 9.08, p = 0.03$
Diploma	143 (62.4)	86 (37.6)	
Current year of study			
Second Year	68 (58.1)	49 (41.9)	$\chi^2 = 14.79, p = 0.01$
Third Year	73 (69.5)	32 (30.5)	
Completed in 2020	41 (42.7)	55 (57.3)	
Passed licensure exams?			
No	10 (62.5)	6 (37.5)	$\chi^2 = 14.92, p < 0.01$
Yet to complete	141 (63.5)	81 (36.5)	
Yes	31 (38.8)	49 (61.3)	

Values in tables are frequencies (percentages).

3.5. Internet exposure/accessibility and students' satisfaction with online learning

As presented in Table 4, it was found that only 16% of respondents had previous online learning experience before the COVID-19 break. Although 64.8% of respondents reported unstable internet connectivity

in their schools, three in five students reported surfing the internet daily with 95.9% using smartphones for internet browsing. Among the online learning applications, Zoom online learning platform was the most common application used for online learning. Regarding association between students' experiences and internet exposure, statistically significant associations were found between students' experience and

Table 4. Internet exposure/accessibility and students' experience of online learning.

Variable	Frequency	Unpleasant Experience		Pleasant Experience	Chi square, p-value
	n (%)	182 (57.2)		136 (42.8)	
Previous Online experience					
No	267 (84.0)	160 (59.9)		107 (40.1)	$\chi^2 = 4.93, p = 0.026$
Yes	51 (16.0)	22 (43.1)		29 (56.9)	
Frequency of internet use					
Monthly	18 (5.7)	12 (66.7)		6 (33.3)	$\chi^2 = 3.32, p = 0.506$
Weekly	71 (22.3)	37 (52.1)		34 (47.9)	
Not Sure	21 (6.6)	13 (61.9)		8 (38.1)	
Twice weekly	18 (5.7)	13 (72.2)		5 (27.8)	
Daily	190 (59.7)	107 (56.3)		83 (43.7)	
College internet reliability					
No	24 (7.5)	19 (79.2)		5 (20.8)	$\chi^2 = 26.07, p < 0.001$
Yes, but not reliable	206 (64.8)	132 (64.1)		74 (35.9)	
Yes, reliable	88 (27.7)	31 (35.2)		57 (64.8)	
Gadget Used					
Laptop/Desktop	13 (4.1)	4 (30.8)		9 (69.2)	$\chi^2 = 3.88, p = 0.049$
Smartphone	305 (95.9)	178 (58.4)		127 (41.6)	
Gadget Ownership					
Self	269 (84.6)	145 (53.9)		124 (46.1)	$\chi^2 = 7.91, p = 0.005$
Someone else	49 (15.4)	37 (75.5)		12 (24.5)	
Application for online learning					
College website	16 (5.0)	8 (50.0)		8 (50.0)	$\chi^2 = 4.17, p = 0.244$
Google meeting	52 (16.4)	27 (51.9)		25 (48.1)	
WhatsApp	106 (33.3)	69 (65.1)		37 (34.9)	
Zoom	144 (45.3)	78 (54.2)		66 (45.8)	

Values in the table are frequencies (percentages).

previous online experience ($\chi^2 = 4.93, p = 0.026$); college internet reliability ($\chi^2 = 26.07, p < 0.001$); type of gadget used ($\chi^2 = 3.88, p < 0.049$); and gadget ownership ($\chi^2 = 7.91, p < 0.005$).

Table 5. Final logistic regression model: factors associated with pleasant experiences of students.

Variable	AOR	95% Confidence Interval		P-value
		Lower limit	Upper limit	
Age (years)				
16 to 20	0.47	0.24	0.92	0.039
21 to 25	0.35	0.09	1.39	0.156
26 +	ref.			
Region of Residence				
Northern Zone	ref.			
Southern Zone	2.30	1.34	3.97	0.003
Coastal Zone	1.37	0.55	3.42	0.505
Year of study				
Second Year	ref.			
Third Year	0.69	0.37	1.28	0.234
Completed in 2020	2.10	1.08	4.10	0.029
College internet reliability				
No	ref.			
Yes, but not reliable	2.54	0.86	7.53	0.093
Yes, reliable	6.39	2.01	20.31	0.002
Gadget Ownership				
Self	3.11	1.44	6.71	0.004
Someone else	ref.			

AOR = Adjusted Odds Ratio; Nagelkerke $R^2 = 0.232$; ref = reference category.

3.6. Multivariate analysis using binary logistic regression

At the final step of the binary logistic regression model (using Backward LR), five variables remained significant at 95% CI. As outlined in Table 5, respondents who reported reliable college internet connectivity were 6.4 times more likely to have had pleasant experiences [AOR = 6.39; 95% CI = 2.01–20.31; P = 0.002] as compared to those that did not. Younger (16–20 years) respondents were 53% less likely to have pleasant experiences than their older (26 years or more) counterparts [AOR = 0.47; 95% CI = 0.24–0.92; P = 0.039]. Respondents resident in southern zone [AOR = 2.30; 95% CI = 1.34–3.97; P = 0.003] and those that completed in 2020 [AOR = 2.10; 95% CI = 1.08–4.10; P = 0.029] were both about 2 times more likely to have had pleasant experiences as compared to their northern zone and second-year counterparts, respectively. Southern zone as indicated above refers to the region of residence of students and not the location of College.

4. Discussion

This study was designed to explore nursing and midwifery students' satisfaction with their online learning experience during the COVID-19 break in Northern Ghana. The usefulness and experiences of online teaching and learning in the Ghanaian context have been previously investigated (Darkwa and Antwi, 2021; Forson and Vuopala, 2019; Henaku, 2020; Ogbonnaya et al., 2020). For this present study, less than half of the participants (42.8%) reported their experience with online learning to be pleasant. The practical approach to nursing and midwifery training, which is usually conducted face-to-face could account for the high unpleasant experiences with online learning among this population. This finding agrees with the findings of previous studies in Ghana and elsewhere in which the majority of participants reported unpleasant experiences with online learning (Hettiarachchi et al., 2021; Sasmal and

Roy, 2021; Tabiri et al., 2022). However, this finding is higher as compared to a study conducted in Jordan in which 26.8% of the sample agreed they had pleasant experiences with online learning (Al-Balas et al., 2020). Similarly, a recent study in Ghana (Sarpong et al., 2022) revealed that only 22.9% of the participants were satisfied with their online learning experience. Furthermore, a systematic review involving 59 published research articles found students' satisfaction with online learning can be as low as 14.0% (George et al., 2014).

However, contrary to the findings in the present study, several studies conducted in high and middle-income countries reported generally higher levels of satisfaction with online learning experiences, with some studies reporting pleasant experiences as high as 72% among study participants (Flack et al., 2020; Kovacević et al., 2021; Surahman and Sulthoni, 2020). This high prevalence of pleasant experiences with online learning in high and middle-income countries is partly attributed to previous online experiences, the low cost of internet data, and good internet connectivity (Al-Balas et al., 2020; International Telecommunication Union, 2020); conditions that are not prevalent in some developing countries, including Ghana. Such differences in satisfaction with online learning experiences could also be due to differences in the background characteristics of study participants, such as the field of study and age of participants.

Regarding challenges of online learning, students identified the high cost of internet data, home obligations/distractions, and boring lectures as major challenges they faced with online learning during the COVID-19 induced break. The high cost of internet data is a major challenge for online teaching and learning in several studies in Ghana (Adarkwah, 2021; Henaku, 2020; Sarpong et al., 2022; Tabiri et al., 2022) and elsewhere (Meccawy et al., 2021). Previous studies have also cited lack of attention as a result of home distractions and interruptions from family members as a challenge to online learning (Henaku, 2020; Maqableh and Alia, 2021; Ogonnaya et al., 2020). During the COVID-19 lockdown, such challenges may have been profound and exacerbated because most income-generating activities had come to a standstill and most families were together at home for long periods.

The present study also explored the associations between students' socio-economic and demographic characteristics, online and internet factors, and their online experiences. It was found that students who had reliable college internet connectivity, were older, resided in Southern Ghana, completed their licensure exams in 2020, and used their own communication devices were more likely to have pleasant experiences. Contrary to the findings of previous studies (Al-Balas et al., 2020; Dabaj, 2009; Sharma et al., 2020; Zalat et al., 2021), this study did not find any associations between previous online experience, gender, and satisfaction with online learning experiences.

Several studies elsewhere (Basri et al., 2018; Shahibi and Rusli, 2017) and in Ghana (Duker et al., 2018) have documented the relevance of reliable internet in schools and its effect on academic performance. Reliable internet access on college campuses allows students to access information readily from various internet sources and databases, which ultimately leads to better academic outcomes and experiences. In the context of practical demonstrations, students are able to search and download recommended video tutorials on various nursing and midwifery procedures, which allows them to rehearse on their own with marginal guidance from teachers in subsequent attempts at practice. Additionally, the presence of fast internet connectivity on college campuses enables lecturers to access information easily to develop content for teaching and learning thus enhancing the teaching and learning experience. However, what remained unclear was whether such benefits on campus translated into pleasant experiences with online learning at home. The present study has filled this lacunae by demonstrating that reliable internet connectivity is a major precursor to students' satisfaction with online learning at home, a finding that is novel to this present study. However, contrary to our findings, other studies conducted on online learning during the COVID-19 break among students in the same medical field, did not find any association between reliable internet

connectivity and satisfaction with online learning experiences (Sasmal and Roy, 2021; Sharma et al., 2020; Thapa et al., 2021).

Additionally, apart from fast internet connectivity in schools, older age was also found to be associated with pleasant online learning experience. This finding contradicts the assertions of other authors that younger age is associated with good online learning experiences (Ke and Kwak, 2013; Zalat et al., 2021). These authors posit that because young people generally utilize technology more than older people, young people are more likely to demonstrate enhanced ability, willingness, and acceptance of e-learning technologies. However, in tandem with our findings, a study involving 1920 students in Canada on the relationship between learners' age and their online learning experiences found that older students had more confidence in computer proficiency, were more motivated, less anxious, exhibited better attitudes, and hence had better experiences in online learning than their younger counterparts (Morin et al., 2019).

Furthermore, one of the major benefits of online learning is its ability to reach a wide range of students irrespective of geographical location (Allen et al., 2016). Adequate infrastructure in Information Communication Technology (ICT) provides the avenue to minimize potential geophysical and other challenges associated with online education. Additionally, among the factors influencing pleasant experiences with online learning, it was discovered that students attending school in the north but residing in the southern part of Ghana were more satisfied with their online learning experience than students residing in the north. This could be due to differences in the proliferation of ICT infrastructure and equipment, income levels, and general living standards between the north and south of Ghana. In Ghana, the southern part is known to have higher socio-economic status and hence higher investments in ICT than the northern part. This socio-economic difference between the southern and northern parts of Ghana has been documented extensively in literature (Nyaaba and Bob-Milliar, 2019; Oteng-ababio et al., 2017); where the latter lags.

However, on a positive note, about half of the nursing students in the present study agreed that online learning did not make them feel anxious, and students did not have challenges with applications or media used. The benefit of online learning with regard to less anxiety is in tandem with previous studies (Forson and Vuopala, 2019; Morin et al., 2019). The majority (78.6%) of students used either WhatsApp or Zoom as a medium for online learning in this study. And the proliferation of these social media apps and their extensive day-to-day use may explain why students had few challenges with application use.

4.1. Limitations

The main limitation of this present study is its inability to establish causality, which is an inherent limitation of cross-sectional study designs. The other limitation is the use of a non-probability sampling method in selecting respondents, and this meant that authors could not have research findings that could be generalized country-wide. The final model for the independent predictors of online learning experiences accounted for only 23.2% of the variance in satisfaction with online learning; although it is a good model fit, the authors could not account for all the variables that predicted online learning experiences among nursing students in Northern Ghana. These notwithstanding, the use of validated tools, recruitment of a large number of respondents and inclusion of five (5) different colleges, despite restrictions due to the COVID-19 pandemic, are the strengths of this study.

5. Conclusion

Overall, this study found that only two in five students studying in nursing and midwifery training colleges in Northern Ghana had pleasant experiences with online learning during the COVID-19 outbreak in Ghana. It was also established that the high cost of data and home distractions were the most profound challenges students faced during this

period. Generally, factors such as reliable internet connectivity, older age, and place of residence were better predictors of pleasant online learning experiences within that period. As such, liaising with telecommunication companies or internet service providers to improve communication infrastructure in Northern Ghana should be highly prioritized by the management of the various nursing training schools. Also, the Ghana Ministry of Health could subsidize the cost of reliable internet in training colleges to improve efficiency and reduce the financial burden this puts on students.

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Author contribution statement

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Data will be made available on request.

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The authors declare no competing interests.

Additional information

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