Nurse Education Today 108 (2022) 105168

Contents lists available at ScienceDirect

Nurse Education Today

journal homepage: www.elsevier.com/locate/nedt

Research article

Number of students in clinical placement and the quality of the clinical learning environment: A cross-sectional study of nursing and midwifery students

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ARTICLE INFO

Keywords:
Cross-sectional
Nursing
Clinical
Learning
Environment
Ghana

ABSTRACT

Background: Clinical placement is an important component of nursing and midwifery education. It exposes students to the real-world healthcare environment, where theoretical knowledge is put into practice. However, the quality of the clinical learning environment in sub-Sahara Africa has not been well explored.
Objective: The objectives of this study were to assess trainees' perceptions of the number of students on the ward or clinical unit, and the quality of the clinical learning environment.
Design: Cross-sectional survey.
Setting: Nursing and midwifery students were recruited from three public hospitals in the Upper East Region, Ghana, between July and August 2019.
Participants: 254 nursing and midwifery students were recruited using the convenience sampling technique.
Methods: Data were collected with the Clinical Learning Environment and Supervision + Nurse Teacher questionnaire. Data were analysed using univariate, bivariate and multivariable analyses.
Results: It was found that the participants rated supervisory relationship; pedagogical atmosphere; role of nurse teacher; leadership style of ward managers; and premises of care on the ward as average. Students' perceptions of the quality of the clinical learning environment were predicted by supervisory relationship ($\beta = 0.219$, 95% CI: 0.016-0.070), leadership style ($\beta = 0.199$, 95% CI: 0.011-0.133) and perception of number of students in clinical placement ($\beta = 0.224$, 95%CI: 0.022-0.093). The trainees indicated that the number of students on the ward did not correspond with the amount of medical equipment and supervisors.
Conclusion: The quality of the clinical learning environment was perceived to be suboptimal. Leadership style, supervisory relationship and perception of the number of students on the ward were the salient factors that influenced students' perceptions of the quality of the clinical learning environment. Leaders of nursing and midwifery training institutions must liaise with stakeholders to enhance the quality of the clinical learning environment.

1. Introduction

Clinical placement is an essential component of nursing and midwifery education worldwide. Clinical placement presents a golden opportunity for students to put theoretical knowledge into practice (Arkan et al., 2018). It exposes students to the real-world healthcare environment where practical teaching and learning occur. Students receive mentorship and coaching from skilled health professionals which help in skills development (Killam and Heerschap, 2013). Clinical placement is an irreplaceable element of nursing and midwifery education (Nordquist et al., 2019).

The success of clinical placement is dependent on the quality of the environment where clinical learning occurs (Alammar et al., 2020a). Clinical Learning Environment (CLE) refers to "an interactive network of

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https://doi.org/10.1016/j.nedt.2021.105168
Received 28 May 2021; Received in revised form 1 September 2021; Accepted 6 October 2021
Available online 9 October 2021
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forces within the clinical setting that influence the students' clinical learning outcomes" (Dunn and Burnett, 1995, pp. 1167). The CLE is complex and influenced by multiple factors. Creating a supportive environment where students can relate cordially with their supervisors is crucial for effective clinical supervision and learning. Studies have shown that a cordial relationship between preceptors and students promotes continuity of clinical learning (Ekstedt et al., 2019). Besides, a positive pedagogical atmosphere on the ward encourages open communication and student participation in clinical unit activities (Pitkänen et al., 2018). The CLE is also influenced by the leadership styles of ward managers. Effective leadership on the ward enhances skills acquisition and independent thinking. The nurse teacher also plays a very important role in ensuring that students meet their learning outcomes. This helps to bridge the gap between theory and practice as well as increases student satisfaction with clinical placement (Arkan et al., 2018). The clinical learning environment is also influenced by the premises of care on the ward which must be well defined and encourage timely sharing of information on patient care (Saarikoski and Strandell-Laine, 2018). Clinical learning outcomes are dependent on the quality of the CLE (Woo and Li, 2020).

The quality of clinical supervision and learning may be compromised if the number of students on the ward/clinical unit is not proportionate to the resources available on the ward, including medical equipment and clinical supervisors. Evidence shows that the number of students in a clinical unit at a time affects clinical supervision and learning. For instance, a qualitative study that sought to explore factors affecting the clinical learning process among Turkish nursing students found that all the respondents expressed concerns about the excess number of students in the clinical unit, which negatively affected clinical learning (Arkan et al., 2018). Also, a quantitative study in Malaysia revealed that too many students in a clinical unit negatively affected clinical learning outcomes (Chuan and Barnett, 2012). In addition, a mixed-method study in Malawi underscored that students were overcrowded in clinical units, which negatively impacted effective clinical supervision (Mbakaya et al., 2020).

In Ghana, clinical placement is a requirement for nursing and midwifery education and can occur in only hospitals (Ziba et al., 2021). Also, other requirements for nursing and midwifery education are almost the same. For instance, both the Registered General Nursing and Registered Midwifery programmes require three years of training for a diploma. In addition, nursing students are required to spend 1632 clinical hours, while midwifery students are required to spend 4128 clinical hours during training (Adjei et al., 2018; Ziba et al., 2021). Moreover, nursing students spend more clinical hours in medical and surgical units, and few hours in specialized units, including obstetrics and gynaecology. On the other hand, midwifery students spend more clinical hours in the maternity unit and few hours in medical and surgical units. Evidence shows that, in Ghana, the student to preceptor ratio is relatively high (1:10 or more students per shift) (Bell et al., 2013). Also, students experience ineffective clinical teaching and supervision coupled with inadequate medical equipment on the ward for hands-on experience (Asirifi et al., 2017; Ziba et al., 2021). This suggests that the number of students on the ward is disproportional to the number of supervisors and equipment.

Yet, there is limited empirical evidence on the number of students on the ward and the quality of the clinical learning environment. To the best of our knowledge, this is the maiden study in Ghana to investigate the relationship between the number of students on the ward and the perceived quality of the clinical learning environment. The findings of this study have implications for practice, policy and research. For instance, stakeholders can leverage the findings to help improve students' clinical experiences as well as cause reforms in nursing and midwifery education. To fill this knowledge gap, this study aimed to assess students' perceptions of the number of students on the ward and the quality of the clinical learning environment.

2. Methods

2.1. Study setting and design

A cross-sectional survey was conducted among trainee nurses and midwives in the Upper East Region. It is one of the sixteen administrative regions in Ghana which has a total population of about 1,046,545 people. Healthcare facilities in the region include private, public and faith-based. The region has about 468 healthcare facilities and three nursing and midwifery training institutions. Three public hospitals with a total bed and a staff capacity of 446 and 820 respectively were selected.

2.2. Population and sampling

The target population for this study was third-year nursing and midwifery students undergoing clinical placement in the selected hospitals. This cohort had more than one clinical placement at the time of the survey, hence had considerable exposure to the clinical learning environment. Therefore, first-year and second-year students were excluded from this study. The population of third-year students in the selected hospitals was 269. All third-year students were invited to participate in this study, however, only 254 honoured our invitation.

2.3. Instrumentation and data collection

A 44-item structured questionnaire was employed to collect data from the participants. The first section of the questionnaire comprised four items, including participants' age, sex, program of study and type of ward. Section two of the questionnaire comprised the Clinical Learning Environment and Supervision + Nurse Teacher (CLES+T) questionnaire. It is a 34-item questionnaire categorized into five dimensions, including supervisory relationship (8 items); pedagogical atmosphere (9 items); role of nurse teacher (9 items); leadership style of ward manager (4 items); and premises of nursing (4 items). All the items on the CLES+T questionnaire were scored on a five-point Likert scale, ranging from 1 to 5 (1 = fully disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree to some extent and 5 = fully agree). The CLES+T questionnaire has been widely employed by researchers across the globe (Johannessen et al., 2021; Zhao et al., 2021). The last section of the questionnaire measured overall perception of quality of clinical learning environment on a five-point Likert scale, ranging from 1 to 5 (1 = very poor. 2 = poor. 3 = moderate/average, 4 = good and 5 = very good). Perception of the number of students on the ward was assessed using five scenarios, scored on a five-point Likert scale ranging from 1 to 5 (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree and 5 = strongly agree). Data were collected between July and August 2019 in the hospitals by trained research assistants. The research assistants visited the wards and contacted third-year students with the aid of ward managers. The questionnaire was self-administered and submitted to the research assistants after completion.

2.4. Statistical analysis

Data were analysed with the aid of Statistical Package for Social Science (SPSS) software, version 23.0. All the questionnaires were cross-checked for errors and completeness before data entry. The Cronbach alpha test was used to computed internal reliability. The reliability coefficient for the whole questionnaire was 0.95. The specific dimensions had the following reliability coefficients: supervisory relationship (0.86); pedagogical atmosphere (0.87); role of nurse teacher (0.87); leadership style of the ward manager (0.81); premises of nursing on the ward (0.74); and perception of the number of students on the ward (0.78). These coefficients are higher than the recommended threshold of 0.70. Data were analysed in three stages, including univariate, bivariate and multivariable analyses. Descriptive statistics were computed at the

univariate level. Pearson's Correlation was computed at the bivariate level and Multiple Linear Regression at the multivariable level. Composite scores were generated for the bivariate and multivariable analyses. All the assumptions underlining Multiple Linear Regression were satisfied.

2.5. Ethical considerations

Permission was sought from the managers of the hospitals before data collection. Participation was voluntary and no participant was coerced or lured into the study. The privacy and confidentiality of participants were protected. Also, the participants had the free will to opt out of the study at any stage. Students who agreed to participate in this study signed a written consent form. This study received the approval of the Navrongo Health Research Centre Institutional Review Board (NHRCIRB 369).

3. Results

3.1. Socio-demographic characteristics of participants

It was found that of the 254 participants, the majority (53%) were males. Exactly 79% were nursing students, while 21% were midwifery students. It was also found that 30% of the participants worked in the maternity ward, while 22% and 20% worked in the female and male wards respectively. The majority (68%) of the participants were aged 20-24 years (Table 1).

3.2. Students' perceptions of the number of students on the ward

The results showed that 47.2% of the participants perceived that the number of supervisors in the clinical unit was proportional to the number of students. Exactly 42.9% of the participants perceived that the student to patient ratio was proportional. In addition, 39.4% of participants perceived that the number of students on the ward was not proportional to the amount of equipment on the ward. Further, 23.6% of the participants perceived that the number of students on the ward was appropriate for effective clinical learning (Table 2).

3.3. Students' perceptions of the clinical learning environment

It was found that all the CLES+T dimensions were rated as average. The overall quality of the clinical learning environment was also rated as average. Leadership style had the highest mean score, while premises of nursing on the ward had the lowest mean score. There was a statistically significant association between perception of the number of students on the ward and the CLES+T dimensions. Participants overall perception of quality had a positive correlation with perception of the number of students on the ward ($p < 0.05$). Also, CLES+T dimensions correlated significantly with the overall quality of the clinical learning environment ($p < 0.05$). The strength of associations was either weak or average (Table 3).

Table 1
Descriptive statistics of participants.

Participant characteristics	Frequency	Percentage
Sex		
Male	136	53
Female	118	47
Age in years		
20-24	172	68
25-29	74	29
30-39	8	3
Type of ward		
Female ward	51	20
Male ward	56	22
Maternity ward	75	30
Other wards (i.e. OPD, ICU)	72	28
Programme of study		
Nursing	201	79
Midwifery	53	21

Table 2
Participants' perceptions of the number of students on the ward.

Parameters	N	Mean (SD)	% of positive response
The number of supervisors/preceptors were adequate for effective supervision/ preceptorship of students	254	3.14 (1.2)	47.2
The ratio of students to patients/clients on the ward was standard (normal) for effective learning of students	254	2.99 (1.2)	42.9
There were adequate materials (tools, equipment, logistics, etc.) to cope with the number of students on the ward	254	2.85 (1.3)	39.4
There were adequate learning opportunities (procedures and other nursing/midwifery activities) to cope with the number of students on the ward	254	3.29 (1.2)	55.5
The number of students on the ward is not very large for effective teaching and learning	254	3.54 (1.2)	23.6

3.4. Predictors of overall quality of clinical learning environment

The significant predictors explained 40% of the total variance in the dependent variable. The model was found to be appropriate ($p < 0.05$). Two of the five CLES+T dimensions significantly predicted the overall quality of the clinical learning environment. These include supervisory relationship ($\beta = 0.219$; 95% CI: 0.016-0.070) and leadership style of ward managers ($\beta = 0.199$; 95% CI: 0.011-0.133). We also found that perception of the number of students on the ward ($\beta = 0.224$, 95% CI: 0.022-0.093) was a significant predictor of the overall quality of the clinical learning environment (Table 4).

4. Discussion (Table 1)

The objectives of the study were to assess students' perceptions of the number of students on the ward and the quality of the clinical learning environment. Generally, the quality of the clinical learning environment was perceived to be average or normal. The majority of the students indicated that the number of students in the clinical unit was disproportional to the resources in the unit. This can contribute to poor clinical

Table 3
Mean scores of CLES+T and associations between CLES+T, perception of number of students on the ward, and overall quality of clinical learning environment.

Dimensions of clinical learning environment	n	Mean (SD)	Number of students on the ward (95% CI)	Quality of clinical learning environment (95% CI)
Overall CLES+T	254	3.49 (0.67)		
Dimensions of CLES+T				
Supervisory relationship	254	3.45 (0.85)	0.528 (0.423-0.621)*	0.519 (0.410-0.625)*
Pedagogical atmosphere	254	3.48 (0.72)	0.600 (0.508-0.685)*	0.543 (0.436-0.632)*
Role of nurse teacher	254	3.53 (0.73)	0.591 (0.495-0.676)*	0.490 (0.377-0.594)*
Leadership style of ward manager	254	3.61 (0.81)	0.502 (0.379-0.605)*	0.512 (0.404-0.607)*
Premises of nursing on the ward	254	3.39 (0.90)	0.603 (0.504-0.691)*	0.453 (0.331-0.560)*
Perceived quality of clinical learning	254	3.65 (1.17)	0.500 (0.386-0.603)*	

* p-value < 0.05.

Table 4
Multiple linear regression analysis for predictors of overall quality of clinical learning environment.

Predictors	Beta	t	p-Value	95% CI
Supervisory relationship	0.219	3.181	0.002	0.016-0.070
Pedagogical atmosphere	0.133	1.503	0.134	-0.006-0.045
Role of nurse teacher	-0.024	-0.269	0.788	-0.040-0.030
Leadership style	0.199	2.327	0.021	0.011-0.133
Premises of nursing	-0.003	-0.042	0.966	-0.065-0.062
Number of students	0.224	3.204	0.002	0.022-0.093
Age of participant	-0.066	-1.307	0.192	-0.359-0.072
Sex of participant	-0.049	-0.824	0.411	-0.387-0.159
Program of study	0.022	0.363	0.717	-0.278-0.404
Ward type	-0.063	-1.256	0.210	-0.114-0.025

$R2 = 0.399$; adjusted $R2 = 0.375$; F-value $= 16.164$, p-value < 0.001.

learning outcomes, hence requires urgent attention of stakeholders. These findings are parallel to prior studies (Asirifi et al., 2017; Bell et al., 2013). For instance, studies conducted in Malaysia, the Netherlands and Malawi also found that there were too many students on the ward at a time, which contributed to overcrowding and negative clinical learning experiences (Arkan et al., 2018; Mbakaya et al., 2020; Nordquist et al., 2019).

These findings may be attributed to the large number of high school graduates who enroll in public nursing and midwifery training institutions every year, in expectation of a 'ready job' after completion. Also, the springing up of private universities and nursing training institutions in recent times coupled with inadequate hospitals for clinical placement may explain these findings.

In addition, supervisory relationships, leadership style and perception of the number of students on the ward were the significant predictors of the overall quality of the clinical learning environment. This suggests that these are the salient factors that influence students' perceptions of the clinical learning environment. These findings are supported by prior studies in Saudi Arabia (Alammar et al., 2020b) and Cyprus (Dimitriadou et al., 2015). On the contrary, a similar study in Finland found that the majority of students rated the clinical learning environment as good (Pitkänen et al., 2018). In Sweden, it was found that students had positive experiences during clinical placement (Ekstedt et al., 2019). The differences in findings may be attributed to differences in contextual factors, including economic and health system factors. This implies that the clinical learning environment may differ in context, hence generalizing findings from developed countries to developing countries can be problematic.

The findings of this study have implications for clinical learning and nursing education at large. For instance, a large number of students on the ward at a time may cause apprehension and workplace conflict. The findings also suggest that clinical supervision and learning may be negatively affected by the overcrowding of students on the ward. Therefore, students may complete a clinical placement with knowledge gaps or lack some competencies. This may contribute to poor job performance, poor quality of care as well as medical errors and patient harm when these students eventually join the health sector (Mbakaya et al., 2020). It is, therefore, necessary for the regulator (Ministry of Health) and leaders of nursing and midwifery training institutions to liaise with the Ghana Health Service to help improve the quality of the clinical learning environment. Further, the Ministry of Health must adopt stringent strategies to regulate the rapid springing up of nursing and midwifery training institutions in Ghana, especially in the private sector.

Further, supervisory relationship and leadership style of ward managers were the salient factors that predicted the overall quality of the clinical learning environment. Therefore, in the quest to improve the quality of the clinical learning environment, stakeholders must invest in developing the supervisory and leadership skills of clinical instructors (Pitkänen et al., 2018). This may help promote effective student supervision, strengthen student to supervisor relationships and improve students' clinical experiences.

4.1. Strengths and limitations of this study

This study has some strengths. First, it is the maiden study in Ghana to investigate nursing and midwifery students' perceptions of the number of students on the ward and the quality of the clinical learning environment. Second, it is one of the few studies in the country that has used a validated instrument to assess students' perceptions of the clinical learning environment. Stakeholders, including leaders of nursing and midwifery training institutions, hospital managers and the Ministry of Health, can leverage these findings to help improve students' clinical placement experiences. In addition, there is a paucity of literature on the clinical learning environment in Africa. This study, therefore, makes a modest contribution to the literature.

However, this study is not devoid of limitations. This study included third-year students only; therefore, generalization of the findings must be done with caution. Also, the majority of the participants were nursing students. In this regard, generalizing the findings to midwifery students may be problematic. This study was conducted in only public hospitals. Therefore the findings cannot be generalized to private hospitals, hence a need for further research.

5. Conclusion

The overall quality of the clinical learning environment in Ghana's public hospitals was below students' expectations. Students' perceptions were influenced by leadership styles of ward managers, supervisory relationships and the perceived number of students on the ward. This study underscores students' concerns and deficits in the clinical learning environment. The findings of this study have implications for policy, practice and research. Going forward, stakeholders must invest in the clinical learning environment to help promote effective clinical supervision and positive clinical learning outcomes.

CRediT authorship contribution statement

Kwadan Naab Augustina and Aaron Asibi Abuosi: Conceptualization; Kwadan Naab Augustina and Anita Anima Daniels: Data curation; Emmanuel Anongeba Anaba, Gladys Dzansi, Aaron Asibi Abuosi: Formal analysis; N/A: Funding acquisition; Aaron Asibi Abuosi, Kwadan Naab Augustina: Investigation; Emmanuel Anongeba Anaba, Anita Anima Daniels, Gladys Dzansi: Methodology; Kwadan Naab Augustina, Gladys Dzansi: Project administration; Kwadan Naab Augustina: Resources; N/A: Software; Aaron Asibi Abuosi, Anita Anima Daniels, Gladys Dzansi: Supervision; Aaron Asibi Abuosi: Validation; Emmanuel Anongeba Anaba, Anita Anima Daniels: Visualization; Emmanuel Anongeba Anaba, Kwadan Naab Augustina: Roles/Writing - original draft; Aaron Asibi Abuosi, Anita Anima Daniels, Gladys Dzansi: Writing - review & editing.

Funding sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

Data and research materials supporting the results in the article are available upon request.

Declaration of competing interest

None.

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