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Influence of clinical learning environment on caring and advocacy among Omani undergraduate nursing students: a cross-sectional survey

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ABSTRACT

Introduction: Nursing students gain clinical skills and shape professional behaviors through ongoing education. As Oman updates its nursing education to match healthcare demands, examining how clinical environments impact students' compassion and advocacy is vital. This study assessed the effect of clinical settings on undergraduate nursing students' caring and advocacy behaviors.

Methods: This cross-sectional, quantitative study used adapted tools, including an author-developed nursing student advocacy (NSA) scale, the clinical learning environment inventory (CLEI-42), and the caring behaviors inventory-24 (CBI-24). Stratified sampling based on university, year, and age selected 461 Bachelor of Science in Nursing students, proportional to each subgroup (CL.95, CI-0.5). Descriptive and inferential statistics, such as Pearson 'scorrelation, were used to assess the relationships among demographics, clinical learning environment, caring behaviors, and advocacy behaviors.

Results: The primary study variables in the clinical learning environment, caring behavior inventory, and nursing advocacy scale showed a significant correlation between the clinical learning environment and caring behaviors ($r=0.388$, $p<0.001$) and a significant correlation between the clinical learning environment and nursing advocacy and right-seeking behaviors ($r=0.634$, $p<0.001$).

Conclusions: A considerable positive moderate relationship exists between the clinical learning environment and caring behaviors, and a substantial positive moderate relationship exists between nursing advocacy and caring behavior.

Keywords: clinical learning environment, caring behavior, nursing advocacy, nursing students

Introduction

The Clinical Learning Environment Inventory (CLEI), developed in collaboration with leading experts in the field, is a globally recognized instrument that uniquely enables the assessment of nursing students' psychosocial dimensions of clinical placements (Chan, 2002a, 2003). The CLEI's six-scale structure and reliability have been consistently supported across studies conducted in Australia and Europe (Newton *et al.*, 2010a; Rodríguez-García *et al.*, 2021; Rodríguez-Monforte *et al.*, 2023). Recent research from Morocco, Nepal, Nigeria, and other low- and middle-income countries demonstrates the CLEI's consistent association with student satisfaction

and perceived teaching quality, confirming its applicability worldwide (Papastavrou *et al.*, 2016; Guejdad *et al.*, 2024; Prajapati, Koirala and Shrestha, 2024; Xu, Wang and Wei, 2025). In the Gulf region, nursing education and training are continually evolving; however, there has been limited investigation, especially in Oman, into students' experiences of clinical placement support, stressors, role ambiguity, and their transition to professional nursing roles alongside their perceptions of the clinical environment. Qualitative studies in Oman suggest that similar findings exist, particularly regarding the conceptualization of the clinical environment, emotional demands, and the importance of supportive clinical instructors (AlAzri *et al.*, 2023). Collectively, these findings support the need for systematic and contextualized assessments of clinical learning environments within Oman's nursing programs.

The clinical nursing component of the Bachelor of Science in Nursing curriculum places students in diverse healthcare settings. Its purpose is to prepare and support nursing students in their pursuit of clinical competence in the profession (Nordquist *et al.*, 2019). Each clinical learning environment requires students to navigate a complex array of interactions to ensure safe patient care and meaningful learning from patient encounters (Gifford, Choi and Kieffer, 2022). New roles, team dynamics, workflows, and cultural norms must be learned as students transition into these environments. Clinical nursing experience offers students hands-on opportunities to care for actual patients under the supervision of trained faculty (Tanner, 2006). This allows students to apply theoretical knowledge, skills, and values in practical patient care settings (Chan, 2002b). Challenges such as insufficient clinical sites, large clinical groups (high professor–student ratios), limited student numbers, and clinical agency constraints can negatively affect nursing students' clinical learning (Ironside and McNelis, 2010; Ironside, McNelis and Ebright, 2014). Additionally, factors including unmet expectations and goals, interpersonal relationships, culture, socialization, and communication have been identified as influential in the clinical learning environment (Edgecombe, Jennings and Bowden, 2013). The clinical setting is thus a vital component in the education of novice nurses, and understanding students' interpretations of this environment is crucial for improving teaching and learning processes (D'Souza *et al.*, 2013).

Caring is central to nursing, as it upholds patient dignity and promotes holistic health (Watson, 2020). Effective care is built upon genuine relationships between healthcare professionals, patients, and their families (Upton, 2018). Nursing students benefit from self-evaluation to reflect on caring behaviors; however, the influence of the clinical environment on their understanding of compassion remains unclear. Regular evaluation and improvement of clinical settings are essential for student development. Patient rights-seeking involves patients advocating for themselves by seeking treatment, ensuring privacy, obtaining consent, and accessing care; these behaviors are shaped by factors such as awareness, culture, income, and setting (Khadka *et al.*, 2022). Nurses' health advocacy aligns with ethical principles, particularly supporting patient autonomy, and requires knowledge, responsibility, and proactive communication (Heck *et al.*, 2022). Although the concept of advocacy remains ambiguously defined (Benjamin *et al.*, 2024), it is an integral part of therapeutic nurse–patient relationships and patient-centered care frameworks. Nurses are expected to advocate for patients during clinical practice because of their continuous presence (Cole, Mummery and Peck, 2022).

Extensive knowledge exists regarding the importance of the clinical learning environment for nursing student training and development. However, few studies have explored its impact specifically on caring behaviors and nursing advocacy, and none have been conducted in Oman. Nursing advocacy, although not fully understood and relatively new to the profession, is a crucial tool for nurses to provide holistic care (Kalaitzidis and Jewell, 2015). Existing research has predominantly focused on professional nurses, leaving the dynamics of advocacy among undergraduate students who display caring behaviors largely unexplored. Therefore, it is reasonable to recommend broadening the undergraduate nursing curriculum to include advocacy education (Nesime and Belgin, 2022).

This study examined the relationships among undergraduate nursing students' self-reported caring behaviors Inventory (CBI-24), Nursing student advocacy (NSA), and their perceptions of their clinical learning environment (CLEI). The findings are expected to guide nursing faculty in developing interventions that optimize learning in clinical settings and enable students to provide high-quality nursing care. This research focused on evaluating the impact of the clinical learning environment on caring and advocacy behaviors among undergraduate nursing students.

The clinical learning environment is crucial for the development and educational growth of nursing students, as it enables them to hone their skills, broaden their knowledge, and integrate theoretical learning with practical application in real-world contexts (Reid *et al.*, 2020). Exposure to patient care scenarios in dynamic environments enhances students' ability to apply critical thinking, develop clinical judgment, and gain expertise necessary for safe and efficient nursing practice (Benner, 2012). Furthermore, the clinical learning environment fosters professionalism, cooperation, and effective communication, which are core skills essential for nursing practice (Ironside, McNelis and Ebright, 2014). Thus, a supportive, well-structured clinical learning environment is fundamental for nurses' future careers.

Nursing students face numerous challenges in the clinical learning environment that can impact their educational experience and readiness for professional practice. These include heavy workloads, stress, variability in clinical site quality, and interpersonal dynamics among patients and healthcare team members. Successfully navigating these hurdles is essential for building resilience and adaptability in nursing practice (Ironside, McNelis and Ebright, 2014). Ongoing changes in healthcare, such as technological advancements and complex patient scenarios, add to the complexity of the clinical learning environment (Benner, 2012). Chronic nursing shortages and increasing patient acuity may further challenge students by creating less supervised and less approachable work environments, which can hinder learning support and guidance (Mlambo, Silén and McGrath, 2021).

Given the strong connection between clinical learning environments and nursing students' intentions to pursue nursing careers, ward managers must foster a positive environment for clinical instruction and facilitate opportunities for the integration of academic and practical experiences through effective feedback systems. Such approaches support students in developing their professional skills and competencies, thereby enhancing the clinical learning environment (Zhao and Zhang, 2024; Zhang *et al.*, 2025). Favorable clinical environments and adequate supervision have been consistently associated with high student satisfaction and commitment to working in hospitals (Rodríguez-García *et al.*, 2021).

The development of caring behaviors is essential for nursing students, as it improves patient care and the overall patient experience, forming a cornerstone of education and professional growth (Watson, 2020). Key behaviors include delivering thorough, patient-centered care, showing empathy and compassion, and communicating effectively. Practicing compassion fosters goodwill and credibility, which in turn enhances patient health outcomes (Babaei, Taleghani and Farzi, 2022). Therapeutic nurse–patient relationships, crucial for achieving positive health outcomes and patient satisfaction, are supported by caring behaviors (Edwards *et al.*, 2004). Nursing students must internalize and demonstrate these behaviors throughout their education, as they reflect the core values and principles of nursing practice. Nurse's view patient advocacy as including protection, representation, delivery of high-quality care, relationship building, and patient education about safety and quality treatment (Nsiah, Siakwa and Ninnoni, 2019). Approaches to advocacy include providing information, showing concern, addressing emotional needs, promoting proximity, maintaining open communication, and building trust (Abbasinia, Ahmadi and Kazemnejad, 2020).

Materials and Methods

Design

A quantitative, descriptive, correlational, and cross-sectional survey was used to evaluate the effects of the clinical learning environment on the caring and advocacy behaviors of Omani undergraduate nursing students. This study aimed to determine whether the perceived quality of their clinical learning environment could predict their levels of caring and advocacy behaviors.

Sample and setting

Undergraduate nursing students from three separate nursing programs in Oman participated in this study. A total of 461 students pursuing a Bachelor of Science in Nursing were selected through stratified sampling, in which the population was first divided into subgroups (university affiliation, year level, and age group) corresponding to them. Subsequently, each stratum was sampled through proportional analysis with a confidence level of.95 and confidence interval of 0.5. Students who completed their clinical rotations in various hospitals (general wards,OPDs, and polyclinics) in their second to fourth year of study were included. Conversely, students in their first year who were not involved in clinical training or practicum were excluded. Effect size assumption Cohen's d -0.80, α level, power (≥.80), target sample size 570, and actual sample size 461. Participants were recruited through assigned university focal points and via university emails and social media platforms such as WhatsApp, Facebook, and X.

Instruments

The online survey collected demographic data on nursing students, including age, sex, and year of enrollment, as well as course subjects and clinical components. The clinical learning environment and nursing students' considerate actions were also assessed using the Clinical Learning Environment Inventory-42 and Caring Behavior Inventory-24 (Newton et al., 2010). Permission was obtained from the copyright holders of the two tools. In addition, a self-devised Nursing Student Advocacy Behavior Scale was used.

CLEI-42 was used to gauge nursing students' perceptions of their clinical learning environment. It consists of 42 self-reported items and is divided into six subscales: student-centeredness, affordances and engagement, individualization, supporting workplace learning, valuing nurses' work, and innovative and adaptive workplace culture. These characteristics were compared with current theoretical advancements in the literature. The Likert scale-based questionnaire uses the following response categories: 4 = strongly agree, 3 = agree, 2 = disagree, and 1 = strongly disagree. Higher scores represent a more positive perception of the clinical learning environment. The CLEI-42 was initially

developed by Chan et al. (2019), with a reported Cronbach's alpha coefficient of 0.73–0.84.

The CLEI-42 expands on the original Clinical Learning Environment Inventory, which relied on ad hoc clustering of questions and the use of internal reliability of its subscales, drawing on empirical research and theoretical knowledge. The scores for negative items were reversed prior to calculating the mean. The total possible score ranges from 38 to 190. Higher scores on the subscales indicate greater satisfaction (Newton *et al.*, 2010b).

The caring behaviors of the nursing students were evaluated using the 24-item Short-Form Caring Behavior Inventory (Wu, Larrabee and Putman, 2006a) developed by Wolf et al. (1994). The questionnaire has four subscales, which contain the following: (1) assurance of human presence, (2) professional expertise and skill, (3) deference to others with respect, and (4) positive connectedness. The inventory is scored on a 6-point Likert scale, with response categories ranging from 1 (never) to 6 (always). Higher scores represent a higher degree of caring behavior. The inventory showed good test–retest reliability (r = 0.82 for nurses) and high internal consistency (Cronbach's alpha coefficient = 0.95). (Wu, Larrabee and Putman, 2006b)

One of the researchers devised a 17-item NSA based on a four-point Likert scale and divided into four sections to measure the level of advocacy behaviors among nursing students: advocating for information (Q1, Q2, and Q8), advocating for freedom (Q3, Q11, Q12, Q13, and Q17), advocating for treatment options (Q4, Q5, Q14, Q15, and Q16), and advocating for correct treatment (Q6, Q7, Q9, and Q10). The scale was validated by three nursing experts, with a CVI ≥ 0.79, and pilot-tested with a group of 45 students recruited from the participating colleges. The reliability test yielded a Cronbach's alpha coefficient of 0.86–0.89. The average score indicated the level of advocacy: ≤35 = low, 36–50 = moderate, and 51–68 = high.

Data collection

Students from participating universities were selected using inclusion and exclusion criteria, with target populations determined by G-power analysis for each stratum. Out Of the target 570 responses, an 80% response rate was achieved; anticipated attrition was offset by increasing each stratum by at least 5%. The online survey required informed consent via a clickable link and outlined the objectives, anonymity, confidentiality, voluntary participation, and withdrawal rights. Participants could contact the lead investigator if needed. The surveys took 10–20 minutes to complete and were distributed through university emails and platforms such as WhatsApp, Facebook, and X. All materials were securely stored without personal identifiers, and only summarized data were used. The data were retained for one year in password-protected files.

Statistical analysis

Descriptive and inferential statistics were used to examine participant profiles, including age, sex, year level, and track in the nursing program. Pearson's correlation coefficients (r) were used to assess the associations among demographic factors, the clinical learning environment, and caring and advocacy behaviors. Diagnostic tests were conducted. Standardized residuals, Cook's distance, and leverage statistics were inspected to identify outliers. Multicollinearity was evaluated using the variance inflation factor and tolerance values. Correlation matrices were examined to rule out singularity among predictors. Missing data were assessed through frequency analysis and were found to be minimal (<5%); thus, listwise deletion was applied. The coefficients of determination (R^2) were computed to identify the factors that accounted for the variation. Pearson 'sr P-values of <0.05 were considered significant.

Ethical considerations

Study approval was obtained from the Oman Central Research Review and Ethics Committee (IRB-MOH: MoH/CSR/22/26064) and ethical clearance from Sultan Qaboos University–College of Nursing and University of Nizwa–College of Health Science. The students were informed about the study's purpose, risks, confidentiality, and their right to voluntary participation or withdrawal at any time. Only students not under the investigators were included, and participation did not affect academic standing. Data were collected anonymously by trained researchers.

Results

Participant characteristics

A total of 600 questionnaires were distributed, of which 461 were returned, yielding a response rate of 77%. As shown in Table 1 the participants were aged from 18 to 25 years, with the majority falling into the 21–22-year age group (n = 214; 46.4%). Of the participants, 355 (76.6%) were female, while 108 (23.4%) were male. According to their year level, the fourth-year nursing students accounted for the majority of the participants (n = 232; 50.3%).

Table 1. Demographic profile of respondents (n= 461)

Demographic Variables	Category	Frequency	Percentage
Age	18-20	84	18.2
	21-22	214	46.4
	22-24	125	27.1
	25-Above	38	8.2
Gender	male	108	23.4
	female	353	76.6
Year Level	Year 2	116	25.2
	Year 3	113	24.5
	Year 4	232	50.3
	Total	**461**	

Table 2. Over-all CLEI-42 , CBI-24 and NSA with Sub dimension Score

	No.of Item	N	Minimum	Maximum	Mean	Std. Deviation
CLEI-42 overall		461	74	152	112.64	11.93
CLE1_innovation	7		8	27	18.02	3.19
CLE2_involvement	7		12	26	18.29	2.28
CLE3_personalisation	7		8	28	18.98	3.04
CLE4_satisfaction	7		10	28	20.21	3.37
CLE5_individualisation	7		7	23	17.37	2.51
CLE6_taskorientation	7		10	28	19.77	2.98
CBI-24_overall		461	24	144	114.51	21.29
CB1_assurance	8		8	48	38.90	7.59
CB2_knowledgeANDskill	5		5	30	23.51	4.71
CB3_respectful	6		6	36	28.98	5.81
CB4_connectedness	5		5	30	23.12	4.62
NSA_overall	17	461	17	68	52.79	9.55

Table 3. Frequency distribution of CLE-42, CBI-24, and NSA-levels and overall mean score

Component	n	Low	Moderate	High	Overall -Mean
Clinical Learning Environment	461	138 (30%)	92 (20%)	231 (50%)	**112.64**
Caring Behavior Inventory	461	101 (22%)	130 (28%)	230 (50%)	**114.51**
Nursing Student Advocacy Scale	461	73 (16%)	93 (20%)	295 (64%)	**52.79**

In Table 2- three and four outlining the CLEI-42, CBI-24 and NSA levels, the undergraduate nursing students perceived the overall CLEI-42 as excellent (M=112.64, SD 11.933). The dimension on "Satisfaction" on the CLEI-42 was the highest (M=20.21, SD=3.277). The individualization" was perceived the lowest (M=17.37, SD=2.517) It also showed that their overall caring behavior is perceived on a high-level scale (M=114.51, SD=21.99). The dimension on "assurance" on the CBI-24 was the highest (M=38.90, SD=7.596), and the "connectedness" was perceived the lowest (M=17.37, SD=2.517). NSA concluded in a high level of advocacy (M=52.79, SD=9.558).

Clinical Learning Environment Inventory, Caring Behavior Inventory, and nursing student advocacy scale scores

Results for the Clinical Learning Environment Inventory, Caring Behavior Inventory, and Nursing Student Advocacy Scale are shown in Table 3. This table illustrates the distribution of CLE, CBI, and NSA scores across the entire student cohort. Regarding the clinical learning environment, 30% of students marked their CLE as low, followed by 20% who marked it as moderate. Fifty % perceived their CLE as high, with an overall mean of 112.64, which is considered high. For the Caring Behavior Inventory, 22% were classified as low, and 28% as moderate. Although the majority, 50 %) reported their CBI as high, the overall mean CBI was 114.51, indicating a high level. For the NSA, 16% of students reported perceiving their advocacy skills as low, 20% as moderate, and 64% as very high. The overall NSA mean of 52.79 suggests high perceived advocacy skills.

Table 4 tests research question four and shows the correlation between perceptions of the clinical learning environment and caring and advocacy behaviors among nursing students. There was a significant correlation between the Clinical Learning Environment Inventory and Caring Behavior Inventory scores ($r = 0.388$, $p < 0.001$) and between the Clinical Learning Environment Inventory and nursing student advocacy scale scores ($r = 0.634$, $p < 0.001$).

Table 5 summarizes the relationships between participant characteristics and scores on the Clinical Learning Environment Inventory, Caring Behavior Inventory, and Nursing Student Advocacy Scale. Age was not significantly associated with CBI-24 scores ($F=2.074$, $p=0.103$). One-way ANOVA found no significant age-based differences across any scale. However, year level significantly affected Caring Behavior Inventory [$F(2, 458) = 4.451$, $p = 0.012$] and advocacy scores [$F(2, 458) = 4.489$, $p = 0.008$], especially between second- and third-year (Caring Behavior: $p = 0.015$; 95% CI = 1.25, 14.39) and third- and fourth-year students (Advocacy: $p = 0.006$; 95% CI = 0.79, 5.91).

Discussions

This study examined Omani nursing students' perceptions of their clinical learning environment in relation to their caring and advocacy behaviors. To

Table 4: Relationship between the clinical learning environment and caring behavior and advocacy of nursing students

		CBI_ overall	CB1_ assurance	CB2_knowledge And skill	CB3_ respectful	CB4_ connectedness	NSA_ overall
CLE -42 overall	Pearson Correlation	.338***	.338***	.342***	.280***	.298***	.280***
CBI-24 _overall	Pearson Correlation	1	.952***	.904***	.953***	.922***	.634***
NSA_overall	Pearson Correlation	.634***	.626***	.551***	.599***	.576***	1
	N						461

$p < .05 \rightarrow *$, $p < .01 \rightarrow **$, $p < .001 \rightarrow ***$

address these objectives, three validated instruments were used: the Clinical Learning Environment Inventory (CLEI-42) (Chan, 2002a), the Caring Behavior Inventory (CBI-21) (Wu, Larrabee and Putman, 2006b), and a Nursing Advocacy Scale validated for nursing students. Together, these tools enabled a multidimensional assessment of how students viewed their clinical experiences and how these perceptions related to professional behaviors central to nursing practice.

The participants were predominantly 21–22-year-old female fourth-year Bachelor of Science in Nursing (BSN) students drawn from three major nursing education providers in Oman. These findings should be viewed in light of the rapid development of nursing education in the country. Although nursing in Oman remains largely female-dominated, reflecting global trends, the profession includes a notable male presence (Flaskerud and Halloran, 2018). Previous literature suggests that gender imbalance in nursing education may create challenges for male students and underscores the importance of inclusive learning environments (Whiteside and Butcher, 2015).

Clinical placement is widely recognized as a cornerstone of nursing education because it provides opportunities to translate theoretical knowledge into practice. Consistent with this view, students in the present study reported generally positive perceptions of their clinical learning environments, with approximately half indicating high satisfaction with their experiences. These findings align with previous studies reporting that nursing students often perceive their clinical settings as supportive learning environments characterized by supervision, role modelling, and professional guidance (Sundler *et al.*, 2014; Soroush *et al.*, 2021; John *et al.*, 2025). At the same time, the literature consistently notes that clinical placements can be among the most challenging components of nursing education due to communication barriers, limited engagement, poorly structured supervision, and inaccessible educators (Berhe and Gebretensaye, 2021; Rozario *et al.*, 2022). Supervision, in particular, is repeatedly identified as a decisive factor influencing learning outcomes, as effective clinical guidance promotes critical thinking, skill acquisition, and student confidence (Soroush *et al.*, 2021; Zhang *et al.*, 2022; Atta, Hammad and Elzohairy, 2024). The present study contributes to this body of knowledge by indicating that students value educators' balanced attention to both clinical tasks and individual learning needs, suggesting that personalized engagement may be a defining feature of a positive clinical learning environment in the Omani context.

With regard to caring behaviors, nearly half of the respondents (49%) perceived themselves as demonstrating high levels of caring. Caring remains foundational to the nursing profession and is strongly linked to patient well-being and therapeutic relationships. Watson's Theory of Human Caring highlights empathy, presence, compassion, attentiveness, communication, and relational engagement as central competencies in nursing development (Watson, 2020). Empirical evidence shows that caring behaviors significantly influence patient satisfaction, treatment adherence, and the quality of nurse–patient relationships (Poorchangizi *et al.*, 2019). Beyond these outcomes, caring behaviors also enhance students' professional identity, collaborative capacity, and ethical sensitivity, ultimately contributing to improved patient outcomes (Ferri *et al.*, 2020; Balay-odao *et al.*, 2024).

Moreover, pedagogical strategies grounded in experiential, cognitive, and behavioral learning theories have been shown to strengthen caring behaviors among nursing students (Labrague and Obeidat, 2025). These findings collectively suggest that nurturing caring competencies in clinical education is essential not only for patient outcomes but also for professional socialization.

In contrast to some earlier studies reporting hesitancy or ambiguity in students' advocacy behaviors, this study found a comparatively strong level of advocacy engagement, with 64% of students reporting positive advocacy perceptions (Elliott, 2025).

Advocacy is widely recognized as a central dimension of nursing practice, encompassing patient protection, education, communication, and safety assurance (Nsiah, Siakwa and Ninnoni, 2019). Nevertheless, research indicates that many nurses engage in advocacy primarily in a reactive or managerial manner, often limited to preventing harm rather than actively promoting patient autonomy and rights (Davoodvand, Abbaszadeh and Ahmadi, 2016; Laari and Duma, 2023). Such findings highlight the ethical complexity of advocacy and the need for stronger preparation in reflective and critical thinking processes. Contemporary scholarship emphasizes that effective advocacy requires the integration of ethics, reflective practice, and supportive clinical environments (Hussein and Abou Hashish, 2023).

Importantly, the present study found that clinical learning environments, caring behaviors, and advocacy engagement were related to one another, reinforcing the idea that supportive educational settings promote professional development. Previous research similarly suggests that positive clinical environments enhance professionalism, caring practices, and student confidence (Inocian *et al.*, 2024). Collaborative relationships between academic faculty and clinical preceptors also appear crucial, as modeling and guided practice support the development of caring attitudes and professional identity (Ekstedt, Lindblad and Löfmark, 2019; Balay-odao *et al.*, 2024). However, despite emerging evidence linking clinical environments to caring behaviors, there remains limited research explicitly examining their

influence on advocacy development, indicating a need for further investigation in this area.

The study also identified differences in caring behavior and advocacy perceptions across academic levels, suggesting that professional competencies may evolve with increasing exposure to clinical practice. Overall, the findings underscore the central role of the clinical learning environment in shaping nursing students' caring and advocacy behaviors. The influence of educators and clinical mentors appears particularly significant, as their engagement, modeling, and support contribute to students' ethical development and professional identity formation. When clinical education effectively integrates caring, advocacy, and ethical practice, nursing students are more likely to graduate as competent, empathetic, and ethically grounded professionals capable of delivering high-quality patient care.

Nevertheless, several limitations must be acknowledged. The sample consisted exclusively of female fourth-year BSN students from three institutions, limiting the generalizability to other academic levels, institutions, or male students. The reliance on self-reported data introduces the possibility of social desirability bias, whereas the cross-sectional design prevents conclusions about causality. Cultural and institutional differences within the Omani healthcare and educational systems may also have influenced students' perceptions.

Conclusion

A supportive clinical learning environment strongly influences students' caring and advocacy skills. Engaging closely with patients under appropriate supervision is central to fostering these qualities. Higher levels of clinical support, personalization, and professional guidance correlate with greater compassion and patient-centered advocacy. Demographics, such as gender, study year, and institution, affect how students develop these behaviors, highlighting their adaptability to different environments. Key recommendations include training educators, redesigning placements for psychological safety, integrating advocacy and caring science into the curriculum, and promoting mentorship and reflection. Future research should use longitudinal and intervention studies to evaluate the impact of changes in clinical learning frameworks on advocacy and caring behaviors. The implications for practice are significant and include revising the curriculum to include advocacy, communication, and patient-rights training, as well as improving policies and clinical teaching to foster empathy and create psychologically safe teaching environments. The cultural context for these findings suggests that students in some countries may not feel comfortable voicing or advocating for patient rights in more hierarchical clinical environments. Advocacy training, such as scenario-based programs, mentorship, and faculty development, can shift the pressure on students and help build advocacy skills.

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Availability of data and materials

The data utilized for this study are available from the author upon request.

Authors' contributions

GFV- Study conception and design; study supervision; data collection; critical revisions for important intellectual content; statistical analysis; writing; and reviewing the final draft. GFV, AN, EI-critical revisions for important intellectual content; conducted statistical analysis; wrote and reviewed the final draft. AC, OT, YA-Data OT, and YA collected data; conducted data analysis; made critical revisions for important intellectual content; conducted statistical analysis; wrote and reviewed the final draft.

Declaration of Interest

The authors declare no conflict of interest.

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Table 5. Participants' study characteristics relationship with CLE-42, CBI-24, and NSA.

		CLE-42				CBI-24				NSA			
Characteristics	**Category**	**mean**	**SD**	**Test statistics**	**p**	**mean**	**SD**	**Test statistics**	**p**	**mean**	**SD**	**Test statistics**	**p**
Age	18-20 21-22 22-24 25-Above			F= 0.564	0.639			F= 2.074	0.103			F=0.657	0.579
Gender	male	110.88	12.169	t= -1.760	0.079	110.77	22.434	t= -2.092	0.037	52.73	9.821	t= -0.072	0.943
	female	113.18	11.825			115.65	20.839			52.81	9.491		
Year Level	Year 2 Year 3 Year 4			F= 1.812	0.165			F= 4.451	0.012			F= 4.849	0.008
Nursing Schools	Oman College of Health Sciences Sultan Qaboos University University of Nizwa			F= 7.312	0.001			F= 3.341	0.036			F= 3.203	0.042