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Factors influencing peer learning among undergraduate nursing students in Marrakech, Morocco

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Abstract

Background & Objective: Peer learning is increasingly recognized as a central strategy in competency-based nursing education, enhancing knowledge construction, clinical reasoning, communication skills, and learner autonomy. In Morocco, however, its use remains limited by traditional teaching approaches and structural constraints. This study aimed to explore the factors that influence peer learning among first-cycle polyvalent nursing students at the Higher Institute of Nursing Professions and Health Techniques in Marrakech.

Materials & Methods: A qualitative descriptive study was conducted from February to June 2024. Using purposive sampling, 80 participants were recruited and included: 60 second- and third-year nursing students who participated in six focus group discussions and 20 nurse educators who completed individual semi-structured interviews. The interview guides were pilot-tested, and all sessions were audio-recorded with participants' consent, transcribed verbatim, and translated when necessary. Data were analyzed using a six-phase thematic analysis approach, combining an initial framework of analytical domains with inductive development of codes and subthemes. Trustworthiness was strengthened through data-source triangulation, member checking, audit trails, reflexive journaling, and independent coding by two researchers.

Results: The analysis was organized into three overarching domains: (1) *Student-related factors*: low intrinsic motivation, dissatisfaction with teaching methods, absenteeism, professional identity, learning prerequisites and prior experience with peer learning. (2) *Educator-related factors*: limited training in cooperative pedagogy, inconsistent group-formation strategies, and varying levels of facilitative teaching engagement. (3) *Pedagogical environment–related factors*: material shortages, insufficient study spaces, overcrowded classrooms, socio-affective tensions, language barriers, heavy workload, continuous assessments, and scheduling constraints. A codebook and integrative matrix highlighted how these multilevel factors interact to shape peer-learning practices.

Conclusion: In this context, peer learning functions mainly as a student-initiated adaptive practice rather than as a structured pedagogical approach. Its implementation is constrained by motivational, pedagogical, and institutional factors. The findings suggest that strengthening peer learning may require formal curricular integration, educator training, improved learning environments, and supportive institutional policies.

Keywords: peer group; students, nursing; qualitative research; education, nursing

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Introduction

Peer learning has become an essential pedagogical strategy in contemporary nursing education. Rooted in socio-constructivist theories, it places students at the center of the learning process and emphasizes knowledge co-construction through interaction, cooperation, and structured peer tutoring. Recent evidence indicates that peer learning enhances theoretical understanding, clinical reasoning, and learner autonomy, while also promoting motivation, communication skills, and confidence among nursing students [1–4]. In recent years, several studies have underscored the effectiveness of near-peer tutoring and collaborative learning models in nursing programs. Research conducted in 2023–2024 shows that peer-assisted learning improves academic performance, strengthens self-efficacy, and supports the acquisition of complex clinical competencies, particularly in high-pressure learning environments such as clinical placements and simulation-based training [2, 5]. These approaches also encourage students to articulate their reasoning, verbalize uncertainties, and engage in reflective practice—elements known to deepen learning and support long-term retention [3, 6].

Beyond cognitive gains, peer learning has been found to reduce anxiety, promote a sense of belonging, and support the development of teamwork and communication—competencies fundamental to safe and effective nursing practice [4,7]. Studies published in 2022 and 2023 demonstrate that collaborative learning environments foster empathy, improve interpersonal interactions, and prepare students for interprofessional teamwork, which is increasingly prioritized in global healthcare settings [7, 8].

A growing body of research also highlights the role of peer learning in narrowing the persistent theory–practice gap in nursing education. Many nursing students struggle to transfer theoretical knowledge into clinical action due to limited supervision, variable learning opportunities, and the complexity of real clinical contexts. Recent findings from 2020 to 2025 indicate that peer learning—especially near-peer learning—helps students bridge this gap by providing guidance, modelling clinical practice, and offering safe opportunities to ask questions and practice skills without fear of judgment [1,2,5]. Simulation-based peer learning has similarly shown strong outcomes in strengthening clinical competence and decision-making during internships and hospital placements [3, 9]. Despite its demonstrated benefits, peer learning remains under- studied in Morocco, where nursing education institutions face substantial structural and organizational challenges. These include increasing student enrolment, limited teaching resources, heterogeneous student profiles, and high curricular pressure. Such constraints may hinder the effective integration of active and collaborative learning strategies into everyday teaching. Understanding the contextual factors that support or limit peer learning is therefore essential, especially in environments where traditional teacher-centered pedagogies remain dominant.

Although peer learning has been extensively examined in international nursing education literature, most studies have primarily focused on its effectiveness and educational outcomes [1–4]. In the Moroccan context, however, empirical evidence remains limited, and what is particularly underexplored is not the effectiveness of peer learning itself, but rather the contextual, pedagogical, and institutional factors that influence its development and functioning within nursing education. Exploring how peer learning is shaped by local educational practices, resource constraints, and organizational conditions is therefore essential to address this context-specific knowledge gap, which justifies the use of a qualitative exploratory approach [8, 10, 11].

Rather than focusing primarily on outcomes or effectiveness, peer learning is increasingly conceptualized as a context-dependent educational process shaped by multiple interacting factors. Recent literature emphasizes that peer learning is influenced by individual factors such as students' motivation, prior knowledge, and professional identity development, as well as educational factors related to teaching practices and pedagogical support [4, 7, 12]. In addition, institutional and environmental conditions—including workload, resource availability, learning spaces, and organizational constraints—play a critical role in enabling or limiting peer-learning practices within nursing education programs [10, 11, 13].

Adopting this multilevel perspective provides a coherent theoretical foundation for exploring the factors, barriers, and facilitators that shape peer learning, particularly through a qualitative exploratory approach.

First-cycle nursing students constitute a distinct educational group compared with senior or postgraduate learners, as they typically demonstrate lower academic autonomy, emerging professional identity, and greater reliance on peer support to cope with foundational learning and early clinical experiences [14, 15]. Their

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learning needs are shaped by the transition into professional training and the acquisition of core competencies, making peer learning particularly relevant at this stage of education [12, 16].

In Morocco, nursing education takes place within institutional contexts characterized by increasing student enrolment, limited pedagogical and material resources, curricular overload, and the continued predominance of teacher-centered teaching approaches [10, 11, 13]. These structural constraints may limit the formal integration of active learning strategies and explain why peer learning often develops as an informal, student-initiated practice within this specific educational setting.

This qualitative study aims to identify the factors influencing peer learning among first-cycle polyvalent nursing students at the Higher Institute of Nursing Professions and Health Techniques (ISPITS) of Marrakech. By exploring the perspectives of both students and nurse educators, this research seeks to provide insights into how peer-learning practices can be strengthened and adapted to the Moroccan nursing education context, ultimately contributing to improved academic outcomes and clinical preparedness.

Materials & Methods

Design and setting(s)

This study employed a qualitative descriptive design to explore the factors influencing peer learning among nursing students and nurse educators. This approach was considered appropriate because it provides a rich, low-inference description of participants' experiences while allowing predefined analytical domains to be complemented by inductively developed codes and subthemes. The study was reported in accordance with the Standards for Reporting Qualitative Research (SRQR) to ensure methodological rigor, coherence, and transparency. The study was conducted from February 1 to June 1, 2024. The study was conducted at the Higher Institute of Nursing Professions and Health Techniques in Marrakech, Morocco. This public institution delivers a three-year professional nursing curriculum and is characterized by increasing student enrollment, limited pedagogical resources, and substantial curricular demands—conditions that make peer learning a particularly relevant pedagogical approach. All data collection activities were conducted on-site.

Participants and sampling

Participants included 60 first-cycle polyvalent nursing students and 20 full-time nurse educators from the same institution. A purposive sampling strategy was used to recruit participants with direct experience of peer-learning activities.

In the Moroccan nursing education system, the first cycle corresponds to the undergraduate level. This study specifically included second- and third-year students because they had sufficient exposure to peer-learning activities and to the institutional learning environment. First-year students were excluded because of their limited experience with peer learning and their early stage of adaptation to the nursing curriculum.

Given the limited size of the eligible study population, a purposive sampling strategy was used, and all students and nurse educators who met the predefined inclusion criteria were invited to participate. This approach enabled comprehensive coverage of perspectives relevant to peer-learning practices.

Inclusion criteria for students were enrollment in the second or third year of the nursing program, previous participation in at least one peer-learning activity, and ability to communicate in Arabic or French. For nurse educators, inclusion criteria included a full-time teaching position at the institute, a minimum of three years of teaching experience, and familiarity with peer learning or collaborative teaching practices. Exclusion criteria consisted of first-year students, students on academic or medical leave, and visiting or temporary nurse educators. All 60 eligible students and 20 eligible nurse educators agreed to participate in the study.

Tools/Instruments

Two semi-structured data collection tools were used in this study: a focus group discussion guide for nursing students and an individual semi-structured interview guide for nurse educators.

Focus group discussion guide for nursing students: The focus group discussion guide explored students' experiences of peer learning in theoretical courses, clinical placements, examination preparation, and practical learning activities. It addressed motivation, satisfaction with teaching methods, professional identity, academic preparedness, absenteeism, educator support, group dynamics, language and communication barriers, academic workload, assessment practices, scheduling constraints, physical learning conditions, and suggestions for improving peer-learning practices.

The complete focus group discussion guide for nursing students is provided in Supplementary Material S2A.

Semi-structured interview guide for nurse educators: The semi-structured interview guide explored nurse

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educators' conceptual understanding of peer learning, current peer-learning practices, student-related facilitators and barriers, pedagogical preparation, group-formation approaches, facilitation practices, perceived benefits, implementation challenges, institutional constraints, and recommendations for formally integrating peer learning into the nursing curriculum.

The complete semi-structured interview guide for nurse educators is provided in Supplementary Material S2B.

Pilot testing of the instruments: Both data collection tools were pilot-tested before the main study. The focus group discussion guide was tested with nursing students who were not included in the final study sample, while the semi-structured interview guide was tested with one nurse educator who did not participate in the main data collection. Minor revisions were made to improve the clarity, sequencing, comprehensibility, and cultural relevance of the questions. Data generated during pilot testing were not included in the final analysis.

Data collection methods

Data were collected through 20 semi-structured individual interviews with nurse educators and six focus group discussions involving 60 nursing students, with 10 students in each group.

Individual interviews with nurse educators: Twenty individual interviews were conducted with nurse educators in quiet office spaces at the study institution. Each interview lasted approximately 35–50 minutes. The interviews addressed nurse educators' understanding of peer learning, pedagogical practices, perceived benefits, implementation challenges, group-formation strategies, and institutional constraints. All interviews were audio-recorded after written informed consent had been obtained.

Focus group discussions with students: A total of six focus group discussions were conducted with the 60 student participants. Each focus group included 10 students and lasted approximately 60–75 minutes.

The discussions were conducted in Arabic or French according to participants' preferences. Each session was moderated by a trained facilitator and supported by an assistant responsible for taking observational notes and documenting group interactions. All focus group discussions were audio-recorded with participants' informed consent.

Data transcription, translation, and management: Audio recordings were transcribed verbatim immediately after each interview or focus group discussion. Arabic transcripts were translated into English by a bilingual researcher. To enhance translation accuracy, 10% of the translated transcripts were independently reviewed for consistency.

The thematic analysis was conducted in English. To minimize translation-related bias, the original Arabic and French transcripts were systematically revisited during coding and theme refinement to verify meanings, resolve ambiguities, and maintain conceptual consistency across languages.

All transcripts were anonymized before analysis and stored securely on password-protected devices accessible only to the research team.

Data analysis

A thematic analysis was conducted using the six-phase approach described by Nowell et al. [17], which included familiarization with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the analytical narrative. The initial analytical framework comprised student-related, educator-related, and pedagogical environment–related domains, while codes and subthemes were developed inductively from the data. Two researchers independently coded the transcripts using NVivo 14. Coding discrepancies were discussed and resolved through consensus. A detailed codebook was iteratively developed and refined to ensure transparency and consistency throughout the analytical process. The complete codebook, including operational definitions, inclusion and exclusion criteria, and illustrative examples, is provided in Supplementary **Table S1**. Data saturation was considered to have been reached when no new codes, subthemes, or themes emerged from the final interviews and focus group discussions.

Trustworthiness and rigor

Several strategies were implemented to strengthen credibility, dependability, confirmability, and transferability [17].

Credibility: Data-source triangulation was achieved by including both students and nurse educators. Member checking was also used to verify the accuracy of participants' accounts and the researchers' interpretations.

Dependability: An audit trail was maintained to document the stages of data collection, coding decisions, theme development, and analytical revisions.

Confirmability: Reflexive journaling and peer debriefing were used to identify and reduce the influence of researchers' assumptions. Reflexive notes documented

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analytical decisions, emerging interpretations, and potential preconceptions. These notes were revisited during theme refinement and consensus discussions between the two coders.

Transferability: A detailed description of the institutional setting, participants, sampling process, and educational context was provided to enable readers to assess the applicability of the findings to similar settings.

Researcher positionality: The research team consisted of nurse educators and qualitative researchers familiar with the Moroccan nursing education context. Reflexive memos were systematically maintained to acknowledge the researchers' prior assumptions and minimize their influence on data interpretation. Interviews and focus group discussions were conducted by research team members trained in qualitative data collection. The interviewers were not involved in the academic evaluation or grading of participating students and did not hold supervisory or hierarchical authority over them during the study period. To minimize potential power imbalances and social desirability bias, participants were informed that participation was voluntary, that their responses would remain confidential, and that declining or withdrawing from the study would have no academic or professional consequences. Interviews and focus group discussions were conducted in neutral settings, and participants were encouraged to express their views freely without fear of evaluation or judgment.

Results

A total of 80 participants took part in the study, including 60 first-cycle polyvalent nursing students and 20 nurse educators from the Higher Institute of Nursing Professions and Health Techniques in Marrakech. **Table 1** summarizes the sociodemographic, academic, and professional characteristics of the participants.

Among the student participants, 53% were male and 47% were female, with a mean age of 20.8 ± 1.2 years. Regarding educational background, 73% held a Baccalauréat, 20% held a DEUG, and 7% held a Licence. Among the nurse educators, 65% were male and 35% were female, with a mean age of 41.5 ± 6.4 years. Half of the nurse educators held a first-cycle diploma, 35% had completed the École des Cadres program, and 15% held a second-cycle diploma. Their teaching experience ranged from 3 to more than 10 years.

Table 1. Sociodemographic, academic, and professional characteristics of participants (n = 80)

Category	Variable	Students (n = 60)	Nurse educators (n = 20)
Sociodemographic	Sex	32 Male (53%) 28 Female (47%)	13 Male (65%) 7 Female (35%)
	Age (years)	Mean = 20.8 ± 1.2	Mean = 41.5 ± 6.4
Educational level	Highest qualification	44 Baccalauréat (73%) 12 DEUG (20%) 4 Licence (7%)	10 First-cycle diploma (50%) 7 École des Cadres (35%) 3 Second-cycle diploma (15%)
Academic/professional experience	Years of experience	Not applicable	3–5 years: 3 (15%) 6–10 years: 10 (50%) >10 years: 7 (35%)

Note: No statistical tests were applicable due to the qualitative nature of the study.
Abbreviations: n, number of participants.

The thematic analysis identified three overarching domains: student-related factors, educator-related factors, and pedagogical environment–related factors. Within these domains, codes and subthemes were developed inductively from participants' accounts and are presented in **Table 2**.

Student-related factors included motivation, satisfaction with teaching methods, absenteeism, professional identity, learning prerequisites, and prior experience with peer learning. These subthemes describe how students' motivational conditions, perceptions of teaching, attendance patterns, professional identity, academic preparedness, and prior exposure to collaborative learning shaped their readiness for and engagement in current peer-learning activities.

Educator-related factors encompassed pedagogical training, pedagogical beliefs, group-formation practices, and the facilitative role of nurse educators. These subthemes reflected differences in formal pedagogical preparation, perceptions of peer learning, approaches to organizing student groups, and the extent to which nurse educators guided and supported peer-learning activities.

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Table 2. Thematic analysis: major themes, subthemes, descriptions, and illustrative examples

Major theme	Subtheme	Short description	Illustrative example (reformulated)
1. Student-related factors	Motivation	Degree of intrinsic or extrinsic motivation toward nursing studies and engagement in learning activities.	"Nursing was not my first choice; my motivation depends on the quality of teaching." (S12)
	Dissatisfaction with teaching methods	Perceived relevance, quality, and attractiveness of teaching methods.	"Teaching relies on outdated methods and lacks variety." (S27)
	Absenteeism as a coping strategy	Absence linked to dissatisfaction, academic overload, or disengagement.	"I skip classes when they feel unhelpful or unengaging." (S34)
	Professional identity	Perception of the social value and personal meaning of the nursing profession.	"The profession is socially undervalued, which affects morale." (S19)
	Preparedness and insufficient prerequisites	Level of preparedness, prior knowledge, and readiness for peer learning.	"Previous courses help, but structured preparation is missing." (S08)
	Prior experience with peer learning	Previous exposure to collaborative learning, tutoring, or peer-assisted activities that shaped students' familiarity, confidence, and readiness for subsequent peer-learning activities.	"We help second-year students and learn ourselves by supporting them." (S41)
2. Educator-related factors	Pedagogical training	Extent of nurse educators' formal or continuous training in cooperative pedagogy.	"Only some nurse educators have received training in peer-learning techniques." (E03)
	Pedagogical beliefs	Nurse educators' conceptualization of peer learning and its perceived benefits.	"Peer learning fosters independence and active participation." (E11)
	Group formation practices	Approaches used to assign students to peer-learning groups.	"Some nurse educators form heterogeneous groups after observing students." (E07)
	Facilitating role	Nurse educator involvement in guiding, supporting, and regulating peer-learning processes.	"Peer learning improves the relationship between nurse educators and students during activities." (E15)
3. Pedagogical environment–related factors	Material & structural resources	Availability of adequate materials, space, and physical learning conditions.	"There is no proper reading space, and classrooms are overcrowded." (S22)
	Socio-affective climate	Quality of interpersonal relations, collaboration, and emotional climate among students.	"Conflicts and individualism reduce the effectiveness of peer learning." (S05)
	Language & communication barriers	Difficulties related to French proficiency or communication skills.	"Language barriers make explanations and teamwork challenging." (S29)
	Program workload	Perceived intensity of coursework, scheduling constraints, and internship overload.	"The program is too heavy to allow time for peer learning." (S14)
	Evaluation system	Impact of assessment frequency and format on availability for peer learning.	"Weekly assessments limit the time available for group preparation." (S36)
	Scheduling constraints	Influence of class timing on participation in peer-learning activities.	"Afternoon classes after morning internships leave no free time." (S48)

Note: Themes and subthemes were developed primarily at a semantic (descriptive) level, reflecting participants' explicit accounts. The integrative matrix in Table 3 provides a higher-level synthesis of relationships among the identified domains.

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Pedagogical environment–related factors included material and structural resources, socio-affective climate, language and communication barriers, program workload, evaluation systems, and scheduling constraints. Participants described several contextual limitations, including overcrowded classrooms, insufficient material resources, lack of dedicated study spaces, interpersonal and communication difficulties, heavy curricular demands, frequent assessments, and restrictive schedules.

To ensure transparency and analytical rigor, Supplementary Table S1 presents the codebook used for the thematic analysis, including operational definitions, inclusion and exclusion criteria, and reformulated illustrative examples. The codebook documents the operational definitions, inclusion and exclusion criteria, and illustrative examples used during the coding and theme-development process, thereby supporting transparency and consistency in the analysis.

The thematic analysis was organized around three overarching domains specified in the initial analytical framework: student-related factors, educator-related factors, and pedagogical environment–related factors. Together, these themes capture the main facilitators and barriers influencing peer-learning practices within the Higher Institute of Nursing Professions and Health Techniques. A detailed presentation of themes, subthemes, definitions, and reformulated illustrative statements is provided in **Table 2**.

Student-related factors emerged as a key dimension shaping engagement in peer learning. Participants frequently referred to variations in motivation, noting that enrollment in nursing studies was often driven by external or circumstantial factors rather than intrinsic interest. Dissatisfaction with conventional teaching methods was commonly reported and was associated with reduced engagement and absenteeism. Students also highlighted the role of learning prerequisites, indicating that knowledge acquired during previous academic years facilitated their involvement in peer-learning activities. In addition, previous exposure to peer tutoring, collaborative revision, and peer-support activities appeared to increase students' familiarity with peer learning and strengthen their confidence in explaining concepts to others. Professional identity also influenced attitudes toward peer collaboration, particularly among students expressing concerns about the societal image of the nursing profession.

Educator-related factors also influenced the organization and implementation of peer learning. Only a limited number of nurse educators reported having received formal training in cooperative or student-centered pedagogies, although most expressed favorable views of peer learning as a means of promoting autonomy and active engagement. Approaches to group formation varied, with some nurse educators favoring heterogeneous grouping based on observed learner differences, while others allowed students to self-select groups. Across accounts, nurse educators emphasized the importance of their facilitative role in guiding and regulating peer-learning activities.

Pedagogical environment–related factors constituted an additional layer of influence. Participants consistently described constraints linked to material and structural conditions, including overcrowded classrooms, limited study spaces, and insufficient pedagogical resources. Socio-affective aspects, such as interpersonal tensions, individualistic behaviors, and language barriers, were also identified as factors affecting group cohesion and collaboration. Moreover, heavy program workload, dense scheduling, and frequent assessments were reported to limit the time available for peer-learning activities.

Overall, the results indicate that peer learning is shaped by the interaction of student-related, educator-related, and pedagogical environment–related factors within the institutional context. The full structure of themes and subthemes is presented in **Table 2**.

Discussion

The findings of this qualitative study reveal that peer learning among nursing students is shaped by a set of interconnected factors involving students, nurse educators, and the pedagogical environment. When viewed through the analytical structure derived from the three main tables—participants' characteristics, thematic analysis, and the integrative matrix—these factors demonstrate how motivational, pedagogical, and institutional dynamics influence the implementation and functioning of peer-learning practices. The detailed codebook supporting the thematic analysis is provided separately in Supplementary **Table S1**.

Student-related factors emerged as prominent influences on peer-learning practices, particularly motivation, satisfaction with teaching, learning prerequisites, professional identity, absenteeism, and prior experience with peer learning. Consistent with prior research, students frequently described entering nursing because of external or circumstantial factors rather than personal vocation, reflecting broader trends in which contextual

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pressures may outweigh intrinsic motivation in nursing career decisions [14, 15]. This finding is consistent with theoretical models of educational motivation, such as Self-Determination Theory, which emphasize autonomy, competence, and relatedness as important contributors to sustained engagement [18, 19]. Widespread dissatisfaction with traditional lecture-based teaching was also reported and is consistent with previous literature suggesting that passive instructional methods may reduce attention, involvement, and deep learning in health professions education [20–22]. Students' preference for more interactive approaches, including case studies and seminars, further supports the relevance of active and collaborative learning strategies in contemporary nursing education [10, 12].

Absenteeism was commonly described as a response to dissatisfaction with teaching or academic overload. This observation is consistent with previous studies suggesting that absenteeism may function as a coping response when learners perceive insufficient pedagogical support or excessive academic demands [23, 24]. At the cognitive level, the findings suggest that learning prerequisites play an important role in students' engagement in peer-learning activities. Students indicated that knowledge acquired during previous academic years supported their participation in peer learning. This finding corresponds with socio-constructivist perspectives emphasizing that meaningful peer interaction requires an adequate foundation of prior knowledge [25]. Recent empirical work further suggests that peer learning may support academic performance, social integration, and confidence when learners possess sufficient foundational competencies and receive appropriate guidance [16, 26]. Language-related difficulties, particularly challenges associated with French proficiency, were also identified as barriers to collaborative learning. This finding is consistent with evidence from multilingual health education contexts, where linguistic challenges may hinder communication, group dynamics, and knowledge exchange [27].

Educator-related factors also influenced peer-learning practices. Although nurse educators expressed positive beliefs about collaborative learning and emphasized its value for autonomy, engagement, and responsibility, a limited number reported having received formal training in cooperative pedagogy. This gap is consistent with evidence showing that inadequate pedagogical preparation among nurse educators may limit the integration of active learning methods into classroom practice [28, 29]. Recent research in health professions education also highlights the complexity of learning transfer and the importance of pedagogical strategies in supporting the effective application of knowledge across educational contexts. For example, structured curricular innovations and networking mechanisms have been shown to facilitate learning transfer in transdisciplinary health education, emphasizing that systematic educational design significantly shapes how learners apply knowledge in evolving educational environments [30]. Other studies similarly confirm that institutional support, professional development, and collaborative networks are essential for sustaining the effective adoption of peer-learning strategies in nursing education [31, 32].

Environmental and institutional constraints emerged prominently in the findings, particularly material shortages, the absence of dedicated study spaces, and overcrowded classrooms. These constraints have repeatedly been identified as obstacles to meaningful learning environments in nursing programs, especially in resource-limited settings [11, 13]. The educational environment strongly influences student motivation, engagement, and self-regulation, and recent studies indicate that inadequate physical infrastructure may reduce opportunities for interaction, group work, and self-directed learning [33, 34]. Socio-affective conditions, including individualism, interpersonal tensions, and language barriers, were also identified. Although conflicts were reported by some students, they did not appear to prevent peer-learning activities entirely. This observation is consistent with evidence suggesting that conflict becomes particularly detrimental to collaborative learning when it is competitive, persistent, or poorly managed [35].

The most restrictive barriers identified were organizational, including curricular overload, continuous assessments, and scheduling conflicts caused by morning clinical placements followed by afternoon classes. These constraints reflect a broader pattern observed in intensive nursing programs, where heavy academic workloads may reduce students' availability and cognitive resources for collaborative learning activities [36]. Students and nurse educators agreed that the assessment system, which includes frequent evaluations, limited the time available for peer learning. This finding reinforces previous research showing that assessment-driven curricula may constrain the adoption of innovative and collaborative pedagogical approaches [37, 38].

Overall, although both students and nurse educators recognized the potential benefits of peer learning, its

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implementation remained constrained by structural, pedagogical, and institutional factors. Peer learning therefore functioned largely as a student-initiated adaptive practice rather than as a formalized pedagogical approach supported by an enabling institutional system. Strengthening institutional support, improving educator training, and optimizing learning environments are essential steps for embedding peer learning more systematically within nursing education and aligning teaching practices with contemporary evidence-based educational standards. To clarify how the identified factors interact, the integrative matrix presented in **Table 3** synthesizes the relationships among student-related, educator-related, and pedagogical environment–related dimensions across five interaction domains: motivation and engagement, preparedness for peer learning, group dynamics, instructional support, and learning opportunities. Rather than acting independently, these factors jointly shape peer-learning practices through reciprocal influences. For example, low student motivation and uneven preparedness may be reinforced by limited pedagogical training among nurse educators and by structural constraints such as heavy workload, overcrowded classrooms, and restricted learning spaces. As summarized in **Table 3**, peer learning therefore emerges not as an isolated instructional strategy but as an adaptive response to multilevel constraints within the educational system. This pattern is consistent with studies in nursing and health professions education emphasizing the interdependence between learner characteristics, teaching practices, and institutional conditions [28–32, 36–38].

Table 3. Integrative matrix of factors influencing peer learning across student-, educator-, and pedagogical environment–related dimensions

Interaction domain	Student-related factors	Educator-related factors	Pedagogical environment related factors	Integrative interpretation
Motivation & engagement	Low intrinsic motivation; dissatisfaction with teaching; absenteeism	Nurse educator beliefs influence motivational climate	Heavy workload; limited study time; continuous assessments	Motivation is shaped by the synergy of nurse educator practices and environmental constraints; peer learning emerges as a compensatory strategy.
Preparedness for peer learning	Prior knowledge and prior experience with peer learning support confidence and readiness, whereas language barriers hinder collaboration	Limited training prevents structured scaffolding	Lack of learning materials and study spaces reduces readiness	Preparedness was described as uneven, and participants emphasized the importance of coordinated support from nurse educators and adequate resources.
Group dynamics	Students reported forming groups primarily based on affinity	Nurse educators differ (heterogeneous groups vs. free choice)	Conflicts and communication issues affect group cohesion	Differences between student and nurse educator practices may contribute to inconsistencies in the organization of peer-learning activities.
Instructional support	Students seek more guidance and active methods	Nurse educators lack formal training and material tools	Overcrowded classrooms limit facilitation possibilities	Instructional support is weakened across all levels, making peer learning largely self-managed by students.
Learning opportunities	Peer learning compensates for deficits in teaching methods	Nurse educators report perceived benefits but cannot systematize them	Program structure restricts available time for collaboration	Peer learning thrives informally but lacks institutional integration and pedagogical structure.

Abbreviations: vs., versus.

Although this study was conducted in a Moroccan nursing education context, several of the identified factors influencing peer learning—such as student motivation, educator pedagogical preparation, workload intensity, and learning-environment constraints—are consistent with findings reported in the international literature. Similar challenges have been documented in nursing education systems characterized by comparable curricular structures and resource constraints. Therefore, while the findings remain context-dependent, they may

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be transferable to similar educational settings, provided that cultural, institutional, and curricular differences are carefully considered. This study has several strengths that enhance the credibility and relevance of its findings. The qualitative descriptive design enabled an in-depth exploration of peer learning from the perspectives of both nursing students and nurse educators, capturing contextual and experiential dimensions that are often underrepresented in quantitative research. The inclusion of two participant groups strengthened data-source triangulation. Furthermore, the systematic thematic analysis, supported by the detailed codebook presented in Supplementary **Table S1** and the integrative analytical framework presented in **Table 3**, ensured transparency, dependability, and a clear audit trail throughout the analytical process. Nevertheless, several limitations should be acknowledged. The study was conducted in a single nursing education institution in Morocco, which may limit the direct generalizability of the findings. However, the detailed description of the institutional, pedagogical, and organizational context enables readers to assess the transferability of the findings to comparable nursing education settings. As with most qualitative studies, the findings are context-dependent and reflect participants' perspectives within a specific institutional environment. In addition, although measures were implemented to enhance reflexivity and minimize potential bias, participants' accounts may have been influenced by social desirability or institutional norms. Future multi-institutional or cross-national studies could further examine the applicability of the integrative analytical framework proposed in this research.

Conclusion

This study provides a contextualized understanding of the multiple factors influencing peer learning among first-cycle polyvalent nursing students in a Moroccan educational setting. The findings indicate that peer-learning practices are shaped by the interaction of student-related, educator-related, and pedagogical environment–related factors rather than by isolated influences. Students' engagement in peer learning was associated with motivational challenges, dissatisfaction with traditional teaching methods, uneven foundational preparedness, absenteeism, and prior experience with peer learning. At the same time, nurse educators' pedagogical practices, beliefs, levels of training, and approaches to facilitation contributed to the organization and implementation of peer-learning activities. Institutional and organizational constraints, including heavy curricular workload, frequent assessments, limited learning spaces, overcrowded classrooms, and restrictive schedules, were also reported to limit the time and conditions available for peer-learning activities. Within this context, peer learning appeared to function primarily as a student-initiated adaptive practice rather than as a formally structured pedagogical approach integrated into the curriculum and supported by institutional mechanisms.

From a practical perspective, the findings suggest that strengthening peer learning in nursing education may require its more explicit integration into curricular planning, targeted pedagogical training for nurse educators, and improvements in physical and organizational learning environments. Better coordination of workload, assessment schedules, and learning spaces may also create more favorable conditions for structured peer interaction. Greater institutional support for peer-learning practices could contribute to improved student engagement, professional identity development, collaborative learning, and competency development, while supporting the broader quality of nursing education in resource-constrained settings.

Ethical considerations

Ethical approval was obtained from the Committee of the HINPHT (approval no. 45/2023). Written and verbal informed consent were obtained from all participants. Voluntary participation, anonymity, and confidentiality were strictly ensured. All data were used exclusively for research purposes.

Confidentiality was ensured at all stages of the research process. Participant identities were anonymized during transcription and coding through the use of identification codes. Audio files and transcripts were stored on password-protected devices accessible only to the research team, and no identifying information was included in publications or presentations.

Artificial intelligence utilization for article writing

Artificial intelligence tools were used solely for language editing and improvement of scientific wording. All analytical decisions, data interpretation, and scientific conceptualization were performed exclusively by the authors. AI tools were not used to generate, analyze, or interpret the study data.

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Conflict of interest statement

The authors declare that they have no conflict of interest related to the conduct of this research or the preparation of the manuscript.

Author contributions

AO and JE were involved in developing the study concept and design, with JE providing methodological supervision and protocol validation. AO carried out data collection and qualitative data analysis, while AA and KA contributed to the interpretation of results, verification of analytical rigor, and revision of theoretical and pedagogical content. All authors collaborated in drafting the initial manuscript, provided critical revisions, and approved the final version for submission.

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Data availability statement

The qualitative data analyzed in this study are available from the corresponding author upon reasonable request. For confidentiality reasons, no raw data containing personal identifiers may be shared publicly.

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