CHAPTER 9

GROUP WORK IN ANATOMY AND PHYSIOLOGY TO ENHANCE KNOWLEDGE ACQUISITION AND RETENTION: PERSPECTIVES OF NURSE EDUCATORS IN GHANA

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Abstract

Human anatomy and physiology form the scientific foundation of nursing education, yet students often struggle with knowledge acquisition and retention. Although group work is recognised as a valuable pedagogical approach that supports collaborative learning, peer engagement, and professional skills development, its implementation in Nursing Education Institutions in Ghana remains challenging. This chapter explores the perspectives of nurse educators in Ghana on the use of group work to enhance knowledge acquisition and retention in human anatomy and physiology. The authors used an exploratory descriptive qualitative design. Twelve nurse educators were purposively selected from six Nursing Education Institutions across three regional clusters. Data were collected through individual interviews using a semi-structured interview guide. Data were thematically analysed using Braun and Clarke's six-phase framework, supported by ATLAS.ti 23. Findings were clustered into three themes: the use of group work in human anatomy and physiology to enhance knowledge acquisition and retention; nurse educators' attitudes towards group work, including perceived benefits and challenges; and strategies to improve group work implementation to enhance knowledge acquisition and retention when teaching human anatomy and physiology. Nurse educators reported that group work enhances knowledge acquisition and retention in human anatomy and physiology by promoting peer learning, critical thinking, and confidence. However, challenges such as large class sizes, limited resources, time constraints, and inadequate training hinder effective implementation. To address these challenges, educators recommended innovative practices, structured guidance, and institutional support to optimise group work in nursing education.

Keywords: anatomy, physiology, knowledge acquisition and retention, group work, nurse educators, undergraduate nursing students.

1 Introduction and background

In nursing, courses such as human anatomy and physiology lay the scientific foundation for understanding health, illness, and clinical care (Sieck, 2019). However, despite its importance, Sieck (2019) as well as Hasan et al. (2022) explain that students often perceive human anatomy and physiology as difficult due to the abstract nature of the content, complex terminology, and the large amount of information that students must retain (Mhlongo & Masango, 2020). Gultice et al. (2015) argue that although traditional lecture-based approaches are often used to teach human anatomy and physiology, lecturing as a teaching strategy does not always promote deep learning or lead to long-term retention of anatomical and physiological knowledge. Arave and Stonebraker (2023) argue that active participation during group work can enhance knowledge acquisition and retention, self-confidence, clinical decision-making, and problem-solving in health science courses. Horiuchi-Hirose et al. (2023) agree and add that active participation in group work also enhances conceptual understanding and the application of knowledge in clinical settings. A study by Wong (2018) also reported that active participation during group work in nursing programmes promotes emotional engagement and peer accountability, leading to improved learning outcomes and student retention. Along similar lines, Jones et al. (2022) found that group work could aid the development of professional competencies, such as collaboration and communication, required for success in nursing education and clinical practice.

Despite the well-documented benefits of group work in health professions education, incorporating it into human anatomy and physiology instruction at Ghana's Nursing Education Institutions (NEIs) presents difficulties. Nurse educators report difficulties managing large class sizes, a lack of training in group facilitation techniques, low student engagement, and limited resources, which Shermin et al. (2019) argue can reduce the effectiveness of group work and create instructional barriers that jeopardise student learning and educator satisfaction. In a systematic review conducted by Hugo-Van Dyk et al. (2023), the researchers found that most empirical studies on group work in nursing education are conducted in high-income

countries that have adequate infrastructure, trained personnel, and technological resources, with little research from low- and middle-income countries, especially in sub-Saharan Africa, where the educational landscape presents unique challenges.

In Ghana, NEIs are under increasing pressure to produce competent nurses who can work in a variety of healthcare settings (Salifu et al., 2022). To meet this demand, nurse educators must use active learning techniques that encourage clinical reasoning and problem-solving abilities. However, systemic issues, such as overcrowded classrooms, poor infrastructure, and insufficient instructional resources, continue to affect teaching and learning outcomes in basic science courses, including human anatomy and physiology (Salifu et al., 2022). Furthermore, nursing students frequently struggle to apply theoretical knowledge in practice due to the didactic nature of teaching (Amoo et al., 2022). Nurse educators play an important role in bridging this gap by implementing innovative teaching strategies, such as group work, and their insights are critical for developing instructional models that enhance knowledge acquisition and retention in the Ghanaian nursing context.

2 Problem statement

Despite the well-documented benefits of group work, the use of group work in human anatomy and physiology teaching remains challenging. For example, in studies by Ndawo (2016) and Mwale et al. (2024), nurse educators responsible for the teaching of human anatomy and physiology reported difficulties in doing group work due to large classes, having limited resources, the lack of knowledge, skills, and training in the use of group work, and managing low student engagement. Elbilgahy et al. (2020) note that, despite a large body of literature on the effectiveness of group work from students' perspectives, the perspectives and experiences of nurse educators regarding its use have not been explored in depth. Exploring literature reporting on the perceptions of nurse educators who use group work to enhance knowledge acquisition and retention in low- and middle-income countries, especially in sub-Saharan Africa, yielded no results. The

lack of research supports the views of Hobenu et al. (2025), whose gap analysis of clinical education in undergraduate nursing in Ghana highlighted the non-stimulating clinical education climate as one of the unique challenges in nursing education in Ghana. Along similar lines, Kobekyaa and Naidoo (2023) identified barriers, including staff shortages, fragmented supervision, and infrastructural deficits, that limit the practical application of group work and problem-based learning in Ghana. The authors further argue that systemic issues, such as overcrowded classrooms, poor infrastructure, and insufficient instructional resources, continue to affect teaching and learning outcomes in basic science courses, such as human anatomy and physiology.

As a nurse educator in Ghana, Author 1 concurs with the findings of both Kobekyaa and Naidoo (2023) as well as Hobenu et al. (2025) that nurse education institutions in Ghana are under increasing pressure to produce competent nurses who can work in a variety of healthcare settings. Despite calls to use active learning techniques to promote clinical reasoning and problem-solving in nursing education (Kobekyaa & Naidoo, 2023), research on human anatomy and physiology teaching in the Ghanaian context is scarce.

This chapter addresses this lacuna by reporting on how human anatomy and physiology nurse educators (also referred to as tutors in Ghana) at NEIs in Ghana perceive the use of group work to enhance knowledge acquisition and retention.

3 Research design and research methodology

3.1 Study design

To explore how human anatomy and physiology nurse educators at NEIs in Ghana perceive the use of group work to enhance knowledge acquisition and retention, the authors used an exploratory descriptive qualitative approach, which is, according to Busetto et al. (2020), ideal for exploring participants' experiences, beliefs, and instructional practices within a specific context.

3.2 Setting and participants

There are 73 publicly funded NEIs in Ghana, distributed across the 16 regions (Ziba et al., 2021). For this study, the 16 regions were clustered into three clusters, namely the Northern, Middle, and Southern clusters. In each cluster, the researchers purposively selected two NEIs that had annual admissions of more than 100 nursing students, had at least two human anatomy and physiology nurse educators with at least three years of teaching experience, and were actively using group work when teaching human anatomy and physiology. This implies that the study population comprised 12 participants (four nurse educators per cluster in each of the three clusters).

3.3 Data collection

Ethics approval was granted by the appropriate ethics review boards in South Africa and Ghana (NWU-00161-12-23 and GHS-ERC:0006/12/23). After obtaining permission from the purposively selected NEIs, a neutral and independent research assistant recruited the participants, informed them about the intended research, and scheduled the individual interviews at a time and place convenient to the participants. Prior to the individual interview, the neutral and independent research assistant obtained voluntary, written consent. On the day of the individual interview, and after obtaining consent to record the 45-60-minute interview, Author 1 used a semi-structured interview guide comprising eight open-ended questions to gain insight into how human anatomy and physiology nursing educators at NEIs in Ghana use group work to enhance knowledge acquisition and retention. Participants were given ample time to respond to the questions and, where appropriate, probing questions were asked to gain deeper insights. Following the interviews, Author 1 saved the original audio recordings to a password-protected folder behind the institutional firewall. Author 1 then transcribed the recordings of the individual interviews verbatim and used member checking to ensure the transcripts accurately reflected the interviews. To enhance anonymity and confidentiality, Author 1 de-identified the data by replacing any identifiable information with a

code and uploaded the code list to a password-protected folder behind the institutional firewall.

3.4 Data analysis

Working with the de-identified data set, the authors used the six-phase framework, as proposed by Braun and Clarke (2006), to thematically analyse the data. In addition, the authors used ATLAS.ti 23, a qualitative data analysis software, to assist with the data analysis (ATLAS.ti Scientific Software Development, 2025). Author 1 served as the primary coder, and Author 2 supported Author 1. To enhance the reliability of the data analysis procedure and trustworthiness of the findings, a qualified and experienced coder served as co-coder. During phase one, Authors 1 and 2, along with the co-coder, read through the data to gain an understanding of its breadth and depth (Braun & Clarke, 2006). In phase two, Authors 1, 2, and the co-coder identified possible codes, discussed the proposed code list, finalised the code list, and linked text segments in the data to the codes. Where necessary, new codes were added to the code list. In phase three, as suggested by Braun and Clarke (2006), the coders clustered the codes together into potential themes. Thereafter, the coders reviewed and refined the themes to ensure that the coded data, sub-themes, and themes accurately reflected the data. In phases five and six, all the authors met to interpret and discuss the findings in relation to answering the research question.

4 Findings

Findings from the data analysis were clustered under three main themes and ten sub-themes (Table 9.1). To substantiate the findings, the authors include supporting quotations. The identifier at the end of each quotation (e.g., A4) serves as an indication of where the supporting quotation could be found in the collated dataset. However, to ensure anonymity, none of the identifiers can be linked to any participant.

Table 9.1: Themes and sub-themes

Theme	Sub-themes
Theme 1: Use of group work in human anatomy and physiology to enhance knowledge acquisition and retention	Sub-theme 1.1: Space for group work activities
	Sub-theme 1.2: Teaching and learning activities during group work
	Sub-theme 1.3: Group work assessment
Theme 2: Nurse educators' attitudes towards group work for knowledge acquisition and retention in human anatomy and physiology	Sub-theme 2.1: Group work promotes students' personal and academic development
	Sub-theme 2.2: Group work enhances knowledge acquisition and retention
	Sub-theme 2.3: Student challenges during group work
	Sub-theme 2.4: Nurse educators' challenges during group work
Theme 3: Strategies on the use of group work to enhance knowledge acquisition and retention in human anatomy and physiology	Sub-theme 3.1: Adopt innovative practices for group work
	Sub-theme 3.2: Student support for group work activities
	Sub-theme 3.3: Monitoring and managing group work activities

4.1 Theme 1: Use of group work in human anatomy and physiology to enhance knowledge acquisition and retention

Collaborative learning activities in the domain of human anatomy and physiology have been shown to significantly enhance depth of understanding and facilitate knowledge retention. These activities can be implemented across various settings, including in-class sessions, collaborative efforts outside the classroom, and a blended learning approach. The range of activities encompasses research, assignments, presentations, and reports, all of which promote critical thinking and teamwork. Diverse assessment methodologies are employed, with some leveraging grades as motivational catalysts, while others use group work as an educational strategy free of traditional grading structures. Overall, when

well structured, group work enhances knowledge acquisition and retention in this intricate subject. These conclusions are further articulated through the exploration of three sub-themes presented hereafter:

4.1.1 Sub-theme 1.1: Space for group work activities

Participants highlighted the importance of selecting appropriate settings for group work, emphasising that the effectiveness of collaborative activities depends on where they are conducted. Some participants preferred working within the classroom, while others found out-of-class environments more conducive to deeper discussions and task completion. A commonly endorsed approach was a blended method combining in-class and out-of-class group interactions.

4.1.2 Sub-theme 1.2: Teaching and learning activities during group work

Participants described group work activities as diverse and goal-oriented, serving as a platform for deeper learning, knowledge acquisition, and retention. These activities included conducting research, completing assignments, preparing presentations, and compiling reports, all of which contributed to a more engaging and interactive learning experience. One participant highlighted the role of research in group work; another emphasized structured academic tasks; and others noted the collaborative nature of group work, which supports teaching and learning activities. These insights underscore the value of group work in fostering critical thinking, teamwork, and shared responsibility in the learning process.

> *"With group work, they can do more research and come out with new knowledge." A1*

> *"Each group is required to present a report on the given topic or question." A2*

> *"They prepare the presentation together as a group, with everyone contributing." A8*

4.1.3 Sub-theme 1.3: Group work assessment

Participants described varying approaches to assessing group work, reflecting differences in grading practices and motivational strategies. While some nurse educators incorporated grades as an incentive for active participation, others applied selective grading based on the nature of the task. One participant highlighted the role of assessment in encouraging engagement, and another participant noted that while some group presentations were graded, others were not. Additionally, certain teaching methods, such as the jigsaw approach, were primarily used as learning tools rather than for formal grading. These responses suggest that assessment in group work varies according to instructional goals, with grading used strategically to enhance participation and accountability.

> *"To motivate students to speak and be part of the group, we normally allocate some small marks for continuous assessment for group work. So, that's how it starts. You do it with all the groups." A7*

> *"There are some presentations that I do grade, but not all of them. So, for those that I grade, I let them know that this presentation or this group work will be graded." A11*

4.2 Theme 2: Nurse educators' attitude towards group work for knowledge acquisition and retention in human anatomy and physiology

Nurse educators emphasised the benefits of group work in promoting student personal and academic development, enhancing knowledge acquisition and retention, and simplifying complex topics. However, challenges such as inadequate participation, poor punctuality, communication barriers, and limited focus on assigned portions can hinder effective group work. Nurse educators face challenges such as large class sizes, insufficient staffing for supervision, insufficient classroom space, and limited time and knowledge for managing group activities. To overcome these issues, more support and training are needed.

4.2.1 Sub-theme 2.1: Group work promotes student personal and academic development

Participants highlighted that group work is a crucial pedagogical approach that enhances both academic performance and personal development among nursing students. It creates a relaxed environment that encourages participation, enhances critical thinking, and facilitates skill development. The participants indicated that the informal nature of group discussions supports engagement by allowing nursing students to express themselves freely. Group work also increases student participation and inclusivity, allowing nursing students to contribute from various sources. Nursing students often bring creativity and innovative ways of presenting information. Beyond academic benefits, group work fosters confidence and strengthens relationships between nursing students and nurse educators. Effective implementation of group work ensures efficient syllabus coverage, enhancing overall student performance.

> *They [nursing students] develop skills in research, information retrieval, and answering questions effectively. It's a valuable learning experience." A5*

> *"It's fantastic because it gives every student the opportunity to participate. In group work, what I've seen is that no answer is wrong, which encourages participation. Students who have read from other sources can contribute as well. It's very useful in teaching anatomy and physiology." A6*

> *"Students learn from their peers and grow their confidence among others…I have mentioned, it even brings me closer to the students. I get to know them better." A12*

4.2.2 Sub-theme 2.2: Group work enhances knowledge acquisition and retention

Group work is a powerful learning tool that enhances knowledge acquisition and retention by simplifying complex topics, fostering deeper understanding through peer explanations, and promoting hands-on and interactive learning. It allows nursing students to grasp anatomy concepts

more effectively by drawing on diverse perspectives. The hands-on nature of group work reinforces learning, and nursing students benefit from the insights and perspectives that emerge during discussions. It also supports weaker nursing students by enabling them to learn from their peers, creating a supportive learning environment. Group work also sparks interest in the subject matter and facilitates knowledge retention by allowing nursing students to explain concepts in their own language using terms they understand. Some participants intimated as follows:

> *"We are achieving understanding of the anatomy concepts and the acquisition of knowledge…" A1*

> *"This hands-on approach, combined with group work, enhances their learning experience and retention of knowledge." A5*

> *"Personally, I benefit from the insights and perspectives that emerge during these group discussions…one reason is that complex terminology is often simplified during group discussions. When students explain concepts to each other in simpler terms…." A2*

4.2.3 Sub-theme 2.3: Student challenges during group work

Group work can be effective in enhancing student learning, but it faces several challenges that could constrain knowledge acquisition and retention. Many participants noted that inadequate participation, especially in larger groups and in out-of-class settings, can lead to imbalances in contributions. Most nurse educators also highlighted that communication barriers, especially among nursing students with varying language proficiency, can hinder participation and, in turn, negatively affect knowledge acquisition and retention. Nursing students may also focus on their assigned tasks, limiting the scope of the topic. These challenges underscore the need for structured guidance, clear expectations, and strategies to foster inclusive participation, timely engagement, and effective communication:

> *"In the in-class setting, some students may not participate fully due to the larger group size..." A2*

"For out-of-class group work, the main challenge is lateness." A2

"Yes, especially considering that language can sometimes pose a challenge." A1

4.2.4 Sub-theme 2.4: Nurse educators' challenges during group work

Nurse educators face numerous challenges in implementing group work, including large class sizes, insufficient supervision, inadequate classroom space, and time constraints. Large class sizes make it difficult to monitor engagement and provide individualized support. Forming manageable groups is also challenging due to time constraints. Classroom space is another major concern, as many institutions lack sufficient room for active group discussions. Time constraints make it difficult to integrate group activities within the limited lesson time. Inexperienced nurse educators also face challenges in managing group work effectively due to the learning curve and lack of formal training. These challenges highlight the need for institutional support, including better classroom infrastructure, adequate staffing, and training programmes. The extracts below highlight some of the participants' perspectives:

"…it's [group work in anatomy and physiology] challenging to supervise and ensure everyone's participation." A11

"The challenges include large class sizes. When you have a large class, it's difficult to group them…" A12

"In summary, classroom space and time are the main challenges for in-class group work, while lateness…" A2

4.3 Theme 3: Strategies on the use of group work to enhance knowledge acquisition and retention in human anatomy and physiology

Participants in this study reported using a comprehensive approach to group work to improve knowledge acquisition and retention. Participants suggested incorporating online tools like WhatsApp, video conferencing, and Google Forms to facilitate collaboration and track progress. Participants

also emphasised the importance of providing clear instructions and thoughtful grouping based on nursing students' skills and backgrounds. Participants also stressed the need for structured planning, time management, and monitoring participation. Participants recommended forming groups of five to ten nursing students and encouraging active discussion, questioning, and problem-solving. Continuous monitoring was also considered essential to ensuring active participation. Three sub-themes supported these findings, namely, adopting innovative practices for group work, student support for group work activities, and monitoring and managing group work activities.

4.3.1 Sub-theme 3.1: Adopt innovative practices for group work

Participants in this study emphasised the importance of innovative practices in group work to enhance learning. Participants suggested incorporating online tools like WhatsApp calls and video conferencing to facilitate collaboration and track group progress. Participants also encouraged nursing students to explore educational materials beyond traditional textbooks, including YouTube for educational videos. Collaboration among nursing students was also emphasised, with WhatsApp platforms for each year group providing valuable resources and fostering a sense of community. This approach not only enriches nursing students' understanding of complex subjects but also allows them to expand their learning beyond the classroom.

> *"I advise them to go beyond textbooks and Google by watching educational videos on platforms like YouTube…" A9*

> *"I have a WhatsApp platform for each year group, where students share useful links and information. Sometimes they discover valuable resources that I haven't come across. I review the links they share and provide guidance on reliable sources. This collaboration helps enrich their understanding of anatomy and physiology." A2*

4.3.2 Sub-theme 3.2: Student support for group work activities

Participants in this study emphasised the importance of providing essential resources and clear instructions for group work activities. Participants recommended materials like whiteboards, flipcharts, markers, and notepads, as well as reliable internet connectivity and laptop access. Participants also emphasised the need for clear guidance, outlining goals, expectations, and tasks to ensure nursing students stay focused. Participants also accentuated the value of thoughtful group composition, balancing skill levels and ensuring that stronger nursing students support their peers. These strategies are crucial for fostering a collaborative and productive learning environment, ensuring that nursing students are well-supported and engaged in group work.

> *"I make sure to provide specific instructions on what the group should work on." A4*

> *"I know who is good. So, I pick the best, along with average and below-average students, and group them." A6*

4.3.3 Sub-theme 3.3: Monitoring and managing group work activities

This study emphasises the importance of structured plans, effective time management, and diligent monitoring in group work activities. Clear guidelines, appropriate group sizes, and active student engagement are crucial for a productive learning environment. Nurse educators, participants in this study, noted that nursing students should be given ample time to prepare and to monitor their progress, ensuring they stay on track. Groups should be assigned varying sizes to facilitate meaningful discussions, balancing collaboration and manageability. Active participation is crucial, with nurse educators guiding discussions by asking guiding questions and bringing nursing students back into the conversation if disengagement occurs. Participants also offered input and questions to guide nursing students towards the right conclusions, enriching their learning through active feedback. Ultimately, clear structure, time management, and active monitoring are essential for creating a supportive and dynamic learning environment for nursing students:

"Give them ample time to prepare and specify the areas they need to study or gather information from… then, I monitor their progress. If they're on track, I encourage them to continue." A4

"If I notice someone isn't engaged, I might ask them about the discussion to bring them back on track…for in-class group work, I move from one group to another, observing their discussions." A2

"Sometimes, I'll ask them questions to guide them in the right direction before moving on to the next… when you listen to their contributions, add your insights to complement their understanding." A3

5 Discussion

This research explored the perspectives of nurse educators in Ghanaian NEIs on the use of group work in the teaching of human anatomy and physiology to enhance knowledge acquisition and retention. The results are consistent with the existing literature, which underscores the advantages of collaborative learning in health professions education (Cohen & Lotan, 2014; Horiuchi-Hirose et al., 2023; Hasan et al., 2022). Nonetheless, problems such as insufficient student participation, time management challenges, and inadequate institutional support impede effective implementation. Mitigating these challenges through structured strategies and innovative methodologies could enhance the efficacy of group work in nursing education.

The authors observed that group work is efficacious in fostering deeper learning and augmenting knowledge retention when teaching human anatomy and physiology. This approach can be applied across various settings, such as in-class activities, collaborative endeavours outside the classroom, and blended methodologies. These findings are consistent with Horiuchi-Hirose et al. (2023). Furthermore, nurse educators underscore the advantages of group work in advancing students' personal and academic development, bolstering knowledge acquisition and retention, and demystifying complex topics (Cohen & Lotan, 2014). Nonetheless,

challenges such as inadequate participation, punctuality issues, communication barriers, and limited focus persist.

5.1 Use of group work to enhance knowledge acquisition and retention

The findings confirm that group work constitutes a valuable pedagogical strategy within health professions education, particularly in human anatomy and physiology courses. Nurse educators emphasise that group work promotes active learning, facilitates peer-to-peer knowledge exchange, and enhances critical thinking. These observations align with previous studies, which suggest that cooperative learning enhances deeper understanding and long-term retention of complex biomedical concepts (Yang, 2023). Moreover, group work affords students the opportunity to cultivate communication, teamwork, and problem-solving skills, which are essential competencies for nursing practice (Hastie & Barclay, 2021).

In addition, the study delineated three primary contexts for group work: in-class, out-of-class, and blended learning environments. Anecdotally, the contextual practice of group work among the nurse educators and nursing students underscores this finding. In-class group work activities facilitate direct engagement with educators, thereby promoting real-time feedback and guidance. This practice aligns with constructivist learning theory, which holds that active engagement with educational material enhances comprehension and retention (Chuang, 2021; Fernando & Marikar, 2017). Out-of-class group work allows nursing students to collaborate more flexibly, encouraging self-directed learning and deeper exploration of anatomical and physiological concepts. Earlier studies in curriculum development demonstrated the critical role of the constructivist learning theory in promoting participatory teaching methods, including group work (Fernando & Marikar, 2017). These findings are consistent with current research in innovative teaching methods (Chuang, 2021). Nonetheless, several nurse educators have expressed concerns regarding out-of-class activities, citing disparities in access to learning resources and personal commitments as potential impediments to effective participation. The blended approach, amalgamating both in-class and out-of-class group work,

was identified as the optimal modality for navigating the contextual challenges, as it synergizes structured guidance with flexibility, thereby catering to diverse learning needs and preferences.

During group work, nurse educators used a variety of instructional strategies, such as student-led research, assignments, reports, presentations, and scheduled group learning sessions. These strategies are consistent with active learning methodologies, which have been shown to significantly improve students' understanding of complex scientific concepts (Porquet-Lupine & Brigham 2023; Stott & Hobden, 2019). In support of Porquet-Lupine and Brigham (2023), research and assignments promote inquiry-based learning, requiring students to delve deeply into anatomical and physiological concepts. Presentations and reports reinforce learning by asking students to articulate and organise their knowledge, which promotes cognitive reinforcement. Feyzioğlu and Demirci (2021) emphasise the value of structured group learning sessions, which promote regular engagement and collaborative problem-solving, and along similar lines, Nolan and McNamara (2022) reported that clustering students into small groups increased their engagement in learning human anatomy and physiology.

Assessment emerged as a valuable factor in the success of group work activities. Melville (2020), Hastie and Barclay (2021), as well as Boud and Bearman (2024) found that grading group work can increase student engagement and accountability. Findings from this study support this finding, as responses from the nurse educators indicated that most graded the group work activities, which, according to them, increased student motivation and accountability. In addition, some nurse educators noted that they do not grade group assignments to encourage intrinsic learning and reduce grade-related stress, supporting the work of scholars such as Hastie and Barclay (2021), who state that not grading group work could create a less competitive learning environment, which may encourage deeper conceptual engagement and improve knowledge acquisition and retention. Based on the responses of the nurse educators in this study, as well as research by Boud and Bearman (2024), it is evident that the absence of accountability mechanisms in non-graded group work may discourage participation by less motivated nursing students and lead some to

contribute less while benefiting from the collective effort. Therefore, nurse educators should adopt a balanced approach when grading group work.

5.2 Benefits and challenges in implementing group work

According to the findings, most nurse educators see group work as a valuable tool for improving student learning and development. Group work, according to the nurse educators who participated in this study, fosters peer learning, encourages active student participation, and creates a relaxed learning environment. This is consistent with previous research showing that collaborative learning improves engagement, motivation, and overall academic performance (Xu, 2024; Xu et al., 2015). Working together not only boosts nursing students' confidence but also helps them develop essential skills like teamwork, critical thinking, and problem-solving, all of which are important in nursing practice.

Nurse educators emphasised that group work allows nursing students to discuss and deepen their understanding of complex human anatomy and physiology. These results are consistent with social constructivist theories, which hold that learning occurs through social interactions and shared experiences (Chuang, 2021). Furthermore, group work was perceived to help students improve their communication and interpersonal skills, gain confidence, and strengthen professional relationships, all of which are necessary for effective nursing practice (Koh et al., 2010).

In addition, the study also found that group work improves knowledge acquisition, retention, and application by allowing nursing students to engage with different perspectives, support weaker peers, and simplify complex topics in their native language. This is consistent with research showing that peer-led discussions promote active engagement and help students construct new knowledge more effectively (Liu et al., 2022). Furthermore, collaborative learning strategies help to bridge the gap between theoretical concepts and practical applications, ensuring that students have a comprehensive understanding of human anatomy and physiology (Chuang, 2021).

Despite the benefits, nursing students faced several challenges during group work, including poor punctuality, low participation, communication barriers, and a tendency to focus only on specific aspects of assigned tasks. In some cases, stronger students take over discussions, leaving weaker students disengaged (Mhlongo & Masango, 2020; McKay & Sridharan, 2024; O'Connell et al., 2024). To address these issues, nurse educators who participated in this study recommended establishing structured group work roles and accountability measures to ensure equitable participation. In a qualitative study among South African students, Reddy (2022) reported that most students complained about the "freeriding phenomenon," in which some students do not actively participate in group work, which breeds frustration and compromises the effectiveness of team learning.

Furthermore, nurse educators faced significant challenges in facilitating group work, including large class sizes, insufficient faculty supervision, insufficient classroom space, and limited institutional support. Supporting the research by Wong (2018) and Albloushi et al. (2024), many nurse educators expressed concern about their own lack of training in collaborative teaching methodologies, which hampered their ability to effectively implement group work. The responses of nurse educators in this study support the views of Elbilgahy et al. (2020) and Buthelezi and Shopo (2023), indicating that a lack of faculty training and resources can impede the successful implementation of active learning strategies. In a phenomenological study conducted among undergraduate students in Hong Kong, Wong (2018) identified conflicts and excessive group work imposed by various course educators on student nurses. To address these challenges, the authors argue that investment in faculty development programmes, increased staffing, and improved learning infrastructure are required to create an environment conducive to group-based learning. While group work in human anatomy and physiology education has obvious advantages, overcoming both student and educator challenges is critical to maximising its effectiveness. Providing structured guidance, incorporating digital learning tools, and cultivating institutional support will be critical to the successful implementation of collaborative learning strategies in nursing education.

5.3 Strategies for enhancing the effectiveness of group work

Participants in the study proposed several strategies for improving the use of group work in human anatomy and physiology education. The use of digital tools like WhatsApp calls, video conferencing, Google Forms for tracking participation, and online discussion forums can improve student engagement and streamline group activities (Xu et al., 2015). Blended learning approaches have been shown to improve student engagement and learning outcomes in health sciences education (Shermin et al., 2019). Using these technologies allows for greater flexibility in group work coordination and accommodates different learning styles.

Nurse educators emphasised the value of teaching nursing students teamwork skills like conflict resolution, time management, and effective communication. As noted by Arruzza et al. (2023), the authors concur that supporting group work activities with necessary resources, such as whiteboards, flipcharts, markers, notepads, internet access, and laptop computers, ensures that nursing students have the tools they need to participate effectively. Furthermore, as Liu et al. (2022) suggest, providing clear instructions and grouping students by skill mix and background enhances collaboration. In addition, as stated by Malik and Shakeel (2022) and Zhang et al. (2024), using structured teaching strategies such as team-based and problem-based learning, which underscore the importance of group work, could, if implemented and facilitated correctly, improve student collaboration in medical and nursing education.

Structured group work organisation, time management strategies, and closely monitoring student participation can all contribute to improving group work effectiveness (Rezaei, 2018). Assigning students to smaller groups of five to ten allows for more effective engagement, and nurse educators can move between groups to encourage participation, facilitate discussions, and ensure that all students contribute. Similarly, young professional midwives utilised small group work to enhance their knowledge in midwifery practice (Hastie & Barclay, 2021). Peer evaluations, structured rubrics, and continuous feedback have been shown to increase accountability and motivation in collaborative learning settings (Liu et al.,

2022). Moreover, nurse educators could enhance effective group work by managing emerging group challenges, focusing on individual contributions, and tracking progress, all of which are critical for maximising the benefits of group-based learning in human anatomy and physiology education.

6 Conclusion

Group work is an important pedagogical strategy for improving knowledge acquisition and retention in anatomy and physiology teaching. Despite the potential benefits, challenges such as low student engagement, insufficient institutional support, and traditional learning attitudes that could negatively impact knowledge acquisition and retention in anatomy and physiology remain. Addressing these challenges necessitates structured pedagogical interventions, faculty training, and curriculum innovations. This study adds to the discussion of collaborative learning in nursing education and the use of group work as a teaching and learning strategy to enhance knowledge acquisition and retention in human anatomy and physiology, which are fundamental to delivering quality care.

7 Limitations and recommendations

While this study offers useful insights into the use of group work in human anatomy and physiology education, it has some limitations. The study included only a small sample of nurse educators from purposefully selected NEIs in Ghana, which may limit the generalisability of the findings. Furthermore, self-reported data from interviews may be susceptible to social desirability bias. Nonetheless, the study's qualitative approach allowed for a thorough examination of nurse educators' experiences and perspectives, providing valuable contextual insights into the use and facilitation of group work as a teaching strategy to enhance knowledge acquisition and retention in human anatomy and physiology. In this study, the authors only employed a qualitative research design; however, conducting more research using other research designs, e.g., a quantitative, mixed, or multi-method research design, may yield additional insights into how human anatomy and physiology nurse educators at NEIs in Ghana

perceive the use of group work to enhance knowledge acquisition and retention.

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9 References

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