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NURSING STUDENTS' ATTITUDES TOWARD SIMULATION-BASED-LEARNING IN NURSING EDUCATION AT IIUM KUANTAN

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Abstract

Simulation-based learning (SBL) revolutionizes nursing education by providing realistic and hands-on experiences. Despite its advantages, research on nursing students' attitudes towards SBL at IIUM Kuantan is limited. The general aim of this study is to evaluate the attitudes of IIUM Kuantan nursing students towards SBL and to determine the factors influencing its effectiveness. Descriptive cross-sectional study was conducted among 157 nursing students from years 2, 3, and 4 at IIUM Kuantan from April to May 2024. Data were collected using the Simulation Based Education Attitude Scale (SBEAS) questionnaires. Participants were selected using purposive sampling, targeting students who had experienced SBL. The reliability of the instrument was confirmed with a Cronbach's Alpha of 0.892. Data analysis was performed using SPSS version 27. The study revealed that the majority of participants (96.8%) had positive attitudes towards SBL, with 70.7% exhibiting excellent attitudes. Analysis indicated no significant association between gender and attitudes towards SBL. However, a significant association was found between the year of study and the perceived effectiveness of SBL (p-value = 0.055). Positive attitudes towards SBL were correlated with higher engagement and better learning outcomes. The study concluded that most IIUM nursing students had excellent attitudes toward SBL. There is a strong positive correlation between attitudes and the effectiveness of SBL, highlighting the importance of fostering positive attitudes to enhance overall educational outcomes. It is recommended that SBL programs be tailored to students' academic progression to maximize their educational impact.

***Keywords**: Attitudes; Education; Nursing Students; Simulation-Based Learning*

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INTRODUCTION

Modern nursing education has made simulation-based learning (SBL) a pillar by providing students with an immersive environment in which to develop critical clinical skills without the immediate risks associated with real-life practice. By simulating intricate clinical scenarios, SBL promotes experiential learning and aids in students' competency and confidence-building before they enter into real healthcare environments. As Gaba (2004) posits, simulation provides a "safe space" for both learning and error, making it ideal for high-stakes professions like nursing. This pedagogical tool has been integrated into nursing curricula globally, to prepare students for real-world clinical challenges. However, despite its widespread use, research on nursing students' attitudes towards SBL, especially within specific cultural and educational settings, such as the International Islamic University Malaysia (IIUM) Kuantan campus, remains underexplored.

The effectiveness of SBL is well-supported by literature. Jeffries (2015) developed the Nursing Education Simulation Framework (NESF), highlighting the importance of designing simulation experiences that are learner-centered and aligned with educational objectives. According to Pai (2016), positive student attitudes towards educational interventions are crucial for their success. Similarly, Persico and Lalor (2019) emphasized the need to understand student perceptions to optimize simulation-based teaching methodologies, making attitudes toward SBL a vital area for further investigation. These studies underscore the need to investigate nursing students' attitudes toward SBL to ensure the effectiveness and engagement of these educational practices. Woda et al. (2016) identified that personalized approaches in nursing education enhance student involvement and satisfaction, while Gharaibeh et al. (2017) stressed the importance of adopting student-centered strategies to bridge the gap between educational objectives and student expectations. These findings suggest that understanding nursing students' attitudes is not only key to improving participation but also to ensuring the overall effectiveness of SBL in enhancing clinical competence.

Cultural and institutional factors can significantly shape students' attitudes toward SBL. In contexts like IIUM Kuantan, where students may encounter a unique interplay of Islamic values and modern healthcare education, the integration of SBL may present distinct challenges and opportunities. For instance, Al-Elq (2010) discussed how educational practices in Islamic settings often emphasize ethical decision-making and community-based care, both of which could influence how IIUM nursing students perceive and engage with simulation exercises. By contextualizing SBL within such frameworks, it becomes imperative to explore how these cultural dimensions influence student participation and attitudes toward simulation in clinical training.

However, research addressing the attitudes of nursing students at IIUM Kuantan toward SBL remains scarce. This is a significant gap, as understanding student perspectives is essential for optimizing the alignment between curricular goals and student engagement. Nursing students' attitudes directly influence the effectiveness of educational strategies, as well as their enthusiasm for learning. Specifically, within the IIUM Kuantan context, where students are being prepared for healthcare environments, understanding their attitudes can provide invaluable insights into how best to tailor simulation experiences to meet their needs. In addressing this gap, this study seeks to explore nursing students' attitudes toward SBL and to assess how these attitudes influence their learning experiences. By synthesizing insights from

various educational research findings, this study will offer practical recommendations for curriculum development, ensuring that SBL remains a dynamic and effective component of nursing education. Furthermore, this research aims to enhance the educational environment at IIUM Kuantan by aligning simulation practices more closely with the specific expectations and needs of nursing students, thereby preparing them for the multifaceted challenges of modern clinical practice.

METHODOLOGY

A cross-sectional descriptive study was carried out among IIUM nursing students from April 2024 to May 2024. The study utilized a purposive sampling method, with a calculated sample size of 220. Exclusion criteria included students who had not taken any simulation-related courses, those unwilling to participate, and those who submitted incomplete questionnaires. The study achieved a response rate of 71.4%, with 157 respondents participating.

The study used a pretested and well-developed questionnaire adapted from Pinar (2016). This questionnaire collected data on respondents' demographics, attitudes toward simulation-based learning (SBL), and the perceived effectiveness of SBL. A pilot test validated the questionnaire, resulting in a Cronbach's alpha of 0.9 for consistency. The pilot study results were not included in the final analysis. Approval to conduct the study was obtained from the Kulliyyah of Nursing Post Graduate Research Center (KNPGRC) and the IIUM Research Ethics Committee (IREC). After explaining the study's purpose and obtaining informed consent, the questionnaires were distributed via a Google Form link through email and WhatsApp messages. Completed questionnaires were securely stored with password protection to ensure anonymity. For statistical analysis, the SPSS program was used for data management. The Kruskal-Wallis test and Mann-Whitney test were applied for analysis, with a p-value of <0.05 considered statistically significant.

RESULTS AND DISCUSSION

A total of 157 IIUM nursing students participated with a majority of 74.5% females and 25.5% males. Regarding the year of study, 15.3% (n = 24) were second-year students, 23.6% (n = 37) were third-year students, and 61.1% (n = 96) were fourth-year students. The demographic data is shown in Table 1.

Table 1: Socio-Demographic Data of Respondents

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Female	117	74.5
	Male	40	25.5
Year of Study	Year 2	24	15.3
	Year 3	37	23.6
	Year 4	96	61.1

Likert scale questions will be categorized into several sub-categories which are poor if scored (13-26), moderate if scored (27-39), good if scored (40-52), and excellent if scored (52-65). Consequently, the results of this study indicate that 96.8% of the participants in this study showed a positive attitude which is a good and excellent level of attitude. From that, 70.7% (n = 111) were categorized as excellent in attitude and 26.1% (n = 41) participants fell into a good level of attitude towards simulation-based learning in nursing education. Meanwhile, 3.2% (n = 5) of the students showed moderate attitude and none of the participants portrayed a poor attitude regarding simulation-based learning in nursing education. The result Attitude Scored by the Participants is shown in Table 2.

Table 2: Tabulation of Attitude Scored by the Participants

Variable	Frequency (n)	Percentage (%)
Poor	-	-
Moderate	5	3.2
Good	41	26.1
Excellent	111	70.7
Total	**157**	**100**

Using a suitable non-parametric test, all the variables included in socio-demographic data (gender and year of study) will be tested for statistical analysis to evaluate their relationship with the variables (level of attitude and effectiveness of SBL). To know the relationship between socio-demographic data (gender) and attitude toward Simulation-Based-Learning in Nursing Education among IIUM Nursing Students, the Mann – Whitney test is used.

Table 3: Relationship between Socio-Demographic (Gender) and Attitude (Mann-Whitney Test)

	Variable	Median (IQR)	t-statistic	p-value*
Gender	Male	4.00 (1)	-0.696	0.486
	Female	4.00 (1)		

*Mann – Whitney test (significant at $p < 0.05$)

The results in Table 3 show that the p-value is 0.486 which is more than 0.05 (significant at $p < 0.05$). Based on the result, the study concludes that there is no association between the socio-demographic (gender) and level of attitude toward Simulation-Based-Learning in Nursing Education among IIUM Nursing Students.

Table 4: Relationship between socio-demographic (year of study) and attitude

	Variable	Median (IQR)	t-statistic (df)	p-value*
Year of Study	Year 2	4.00(1)	2	0.055
	Year 3	4.00(0)		
	Year 4	4.00(1)		

*****Kruskal Wallis test (Significant at $p < 0.05$)

In the Kruskal-Wallis test, there will be an association between the variables if the p-value is less than 0.05 (to reject the null hypothesis). Based on Table 4, the p-value for the year of study is 0.055. From the result above, it should be noted that the p-value for the variables is more than the significant value which is 0.05. Thus, there is no association between socio-demographic data (year of study) and attitude on Simulation-Based-Learning in Nursing Education.

Table 5: Relationship between Socio-Demographic (Gender) and effectiveness of SBL

	Variable	Median(IQR)	t-statistic	p-value*
Gender	Male	32.00(6)	-1.571	0.116
	Female	31.00(6)		

*Mann – Whitney test (significant at $p < 0.05$)

Mann – Whitney test was used to determine the relationship between socio-demographic data (Gender) and effectiveness of Simulation-Based-Learning in Nursing Education among IIUM Nursing students. Table 5 shows the results of the test that indicate no association between the variables. Since the p-value obtained is more than 0.05 which is 0.116, the null hypothesis remains.

Table 6: Relationship between Socio-Demographic (Year of Study) and Effectiveness of SBL

	Variable	Median (IQR)	t-statistic (df)	p-value*
Year of Study	Year 2	62.62	2	0.039
	Year 3	90.34		
	Year 4	72.06		

*Kruskal Wallis test (Significant at $p < 0.05$)

Based on Table 6, Kruskal Wallis test between socio-demographic data (year of study) & effectiveness of SBL, the p-value obtained is 0.039 which indicates there are association between year of study and effectiveness of Simulation-Based-Learning in Nursing Education among nursing students. The p-value from the Kruskal Wallis test for the relationship between sociodemographic background (year of study) and effectiveness of SBL indicates that there are significant differences between the variables. Hence, Post hoc test was done to determine which group has the significant association between the variables.

Table 7: Association between Sociodemographic Background (Year of Study) and Effectiveness of SBL

Sample 1 – Group 2	p - value
Year 2 – 3	0.032
Year 2 - 4	0.396
Year 3 - 4	0.028

The tables above show the exact group that has the significant association between the variables where the $p < 0.05$. Thus, proving that there is an association between sociodemographic background (year of study) and the effectiveness of SBL.

Table 8: Relationship between level of attitude and effectiveness of SBL

	Attitude	**Effectiveness of SBL**
Attitude Effectiveness of SBL	-	0.661**
	0.661**	-

** *Correlation is significant at the 0.01 level (2-tailed)*

The association between the level of attitude and effectiveness of Simulation-Based-Learning in Nursing Education among IIUM Nursing students was investigated using Spearman correlation. The data provided in Table 8 reveal a Spearman correlation coefficient of 0.661, which is significant at the 0.01 level (2-tailed). This indicates a substantial positive association between attitude and effectiveness of SBL, implying that as attitudes toward simulation-based learning increase, so does the effectiveness of SBL. The null hypothesis, which claims that these variables do not correlate, is rejected. Thus, there is a considerable relationship between attitude and effectiveness in simulation-based learning.

This study revealed that the overall attitude of the IIUM Nursing students toward SBL in Nursing Education can be categorized as excellent, which is based on the Median (IQR) value attained, which is 59.00. However, the study found no significant association between the sociodemographic factor of gender and the level of attitude towards SBL in nursing education among IIUM nursing students. The p-value was 0.486, which is greater than the significance threshold of 0.05 (significant at $p < 0.05$). This result aligns with findings from other studies, such as those by Cant and Cooper (2014), which also reported no significant gender differences in attitudes toward simulation-based learning among nursing students. It informed the reader that attitudes towards SBL are not influenced by gender, indicating a uniform perception across students. The Kruskal-Wallis test results indicated no significant association between the year of study and the level of attitude towards SBL, with a p-value of 0.055, slightly above the significance threshold. This suggests that students' attitudes towards SBL do not vary significantly across different years of study.

A study by Liaw et al. (2012) supports these findings, highlighting that attitudes towards SBL can be positive across all academic levels, emphasizing the importance of integrating SBL throughout the nursing curriculum to maintain consistent engagement. The Mann-Whitney test was used to explore the relationship between gender and the effectiveness of SBL. The test results indicated no significant association, with a p-value of 0.116, which is greater than the 0.05 threshold. This finding suggests that the perceived effectiveness of SBL is not influenced by gender. Conversely, the Kruskal-Wallis test revealed a significant association between the year of study and the effectiveness of SBL, with a p-value of 0.039. This indicates that the effectiveness of SBL is perceived differently across various academic years. This result is corroborated by the work of Lateef (2010), which highlighted that students in advanced years of study might find SBL more effective due to increased exposure and familiarity with clinical scenarios. Further post hoc analysis was conducted to identify which specific groups exhibited significant differences. The results showed significant differences between Year 2 and Year 3 ($p = 0.032$) and Year 3 and Year 4 ($p = 0.028$), but not between Year 2 and Year 4 ($p = 0.396$). These findings suggest that third-year students perceive SBL as significantly more effective compared to their second and fourth-year counterparts. This could be due to the increased clinical responsibilities and the need for practical application of knowledge typically experienced in the third year of nursing programs, as noted by Jeffries (2015).

The study concludes that while gender does not influence the attitudes or perceived effectiveness of SBL, the year of study plays a significant role in determining its effectiveness. These findings highlight the importance of tailoring SBL experiences to align with the academic progression of nursing students to maximize its educational impact. Future research should continue to explore these dynamics to further enhance the implementation and outcomes of simulation-based learning in nursing education. The positive correlation found in this study is consistent with findings from another study. For instance, Koukourikos et al. (2021) mention in their review paper that the implementation of simulation enables students to practice their clinical and decision-making skills for some significant issues they may face in their daily work. Furthermore, the SBL itself is considered a protected environment and the sense of security will enhance students' self-esteem and confidence, thus promoting learning.

The engagement between students and SBL is crucial as it enhances the realism of the simulation experience, thereby improving the learning outcomes. Moreover, Sinclair and Ferguson (2009) noted that students who perceive SBL positively tend to exhibit higher levels of motivation and participation, which are critical factors for the success of simulation-based educational interventions. These students are more likely to appreciate the practical applications of their learning, leading to better retention of knowledge and skills. The findings also align with the study by Baptista, Fereira, and Martins (2016), who stated that the attitude of nursing students towards simulation-based education significantly influences their perceived effectiveness of the method. The students' high-fidelity simulation experience has left them happy. Even though there may be times when they feel extremely stressed and anxious, it helps them learn more and gets them ready for the real world. Their study highlighted that positive attitudes towards SBL were associated with higher levels of satisfaction and perceived learning, which in turn translated into better performance in clinical settings.

Practical Implication

The findings of this investigation into SBL among IIUM Kuantan nursing students have important practical ramifications for nursing education as well as the larger interprofessional learning environment in the healthcare industry. Through proving that nursing students at every academic level have a positive perception of SBL and that sociodemographic factors such as gender have no effect on attitudes toward SBL, educators and curriculum developers can take a more inclusive stance when putting simulation-based interventions into practice. The practical implications that this study highlighted are: 1) enhancing engagement and motivation, 2) tailoring SBL with the academic progression, 3) integration of SBL in interprofessional education, 4) year-specific learning gaps, 5) reassessment of role gender in SBL, and 6) continuous curriculum evaluation and improvement.

Enhancing engagement and motivation: The study emphasizes how important it is to keep a positive outlook on SBL as it plays a crucial role in encouraging involvement and engagement. This emphasizes how crucial it is to develop realistic, well-thought-out, and captivating simulations that appeal to students at various phases of their academic careers. In order to sustain students' interest and engagement, simulation exercises ought to get more difficult and pertinent as they advance to higher levels.

Tailoring SBL with academic progression: Differentiated learning experiences are necessary, as indicated by the Kruskal-Wallis test results, which show significant variations in the perceived effectiveness of SBL across academic years. Compared to second and fourth year students, third-year nursing students—

who are usually more involved in clinical practice—think that SBL is more successful. This might be as a result of how applicable theoretical knowledge is and how relevant simulations are to their growing clinical responsibilities. Still, more research in this field is required. Teachers should consider this as well, in addition to students, by customizing simulation scenarios for the particular academic year. For example, second-year students might benefit from foundational simulations focusing on basic clinical skills and patient safety, while third-year students could engage in more complex, interdisciplinary simulations that mirror real-world clinical environments. Fourth-year students, preparing for the professional exam, might benefit from advanced simulations that simulate high-pressure, decision-making scenarios they are likely to encounter post-graduation. These strategies might help ensure that SBL remains relevant and effective throughout the nursing curriculum, maximizing its educational impact at each stage.

Integration of SBL in interprofessional education: Collaboration amongst professionals is becoming more and more necessary for the delivery of healthcare, and SBL can provide a platform for developing these abilities in a safe setting. The interprofessional scenarios in which nursing students work with students from other healthcare disciplines, like medicine, pharmacy, and allied health sciences, could be added to the IIUM Kuantan's simulation programs. Effective patient care requires the ability to communicate, work as a team, and solve problems collaboratively. These abilities can be improved with this method.

Year-specific learning gaps: The notable variations in the perceived efficacy between Year 2 and Year 3, as well as between Year 3 and Year 4, indicate that teachers should concentrate on closing learning gaps that appear at various points throughout the academic program. While fourth-year students demonstrated a decline in perceived effectiveness, it would be advantageous to introduce more advanced simulations earlier to capitalize on their heightened perception of SBL effectiveness. Additionally, simulations that are explicitly aligned with transition-to-practice goals could help third-year students. These observations guide the creation of curriculum interventions that improve learning outcomes by guaranteeing that SBL is valued consistently at all academic levels. Reassessment of role gender in SBL: It is implied that SBL programs do not require gender differentiation due to the lack of significant gender differences in attitudes toward SBL, as supported by Cant and Cooper (2014) and the Mann-Whitney test. Instead of focusing on gender-specific interventions, educators can concentrate on universal strategies that serve the entire cohort because of this uniform perception. The findings imply that SBL offers a fair learning environment in which male and female students gain equivalently.

Continuous curriculum evaluation and improvement: The research highlights the necessity of continuous curriculum assessment to guarantee that SBL keeps up with the changing requirements of nursing students. In order to keep the program in line with student needs and the evolving healthcare landscape, educators will be able to make adjustments to simulation content, delivery methods, and assessment strategies with the support of ongoing assessments of student attitudes and perceptions. Using instruments such as focus groups, surveys, and post-simulation debriefs, educators should regularly ask students for feedback in order to assess the success of simulations and pinpoint areas that require improvement.

This study's practical implications emphasize how important it is to modify simulation-based learning activities so that they correspond with nursing students' academic progression. Through consideration of the differences among cohorts regarding the efficacy of SBL, educators can create

simulations that are more focused, pertinent, and captivating. SBL's value in nursing curricula is further enhanced by the study's findings regarding the lack of gender differences, which indicate that SBL offers an equitable educational platform. In the end, SBL's beneficial impact on interprofessional learning creates new opportunities for simulation integration into interdisciplinary healthcare education, which enhances students' individual and teamwork skills in the clinical setting.

CONCLUSION

In conclusion, the substantial positive association between the level of attitude and the effectiveness of SBL among IIUM Nursing students underscores the importance of fostering positive attitudes toward simulation-based learning. This can be achieved through well-designed simulation programs that are engaging, relevant, and reflective of real-life clinical scenarios. By doing so, educational institutions can enhance the effectiveness of SBL, ultimately leading to better-prepared nursing graduates.

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