

EFFECTS OF SIMULATION-BASED EDUCATION ON THE CLINICAL EDUCATION OF NURSING STUDENTS

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Abstract



INTRODUCTION

Clinical education plays a very important role in helping nursing students become skilled, confident, and professional healthcare workers. In nursing, learning the theory is not enough. Students must also learn how to use that knowledge when taking care of real patients. Classroom lessons help students understand medical concepts, but real learning happens during clinical placements. These hands-on experiences are where students practice what they've learned, develop important skills like patient care, communication, teamwork, and time management. But in many countries, including Pakistan, clinical education is often not up to the mark. Hospitals are crowded, there is not enough staff to guide students properly, and students do not always get the chance to practice on real patients. Sometimes, due to a lack of proper equipment or time, they are left observing

instead of doing. These problems make it hard for students to feel confident or fully ready for real nursing work after graduation (Dow et al., 2021; Siddiqui et al., 2024).

Simulation-based education, also known as SBE, can be a big help in solving these problems. In simulation, students get to practice their nursing skills in a safe and controlled setting that feels real but does not involve actual patients. These setups can include role-playing, using models, mannequins that act like patients, or even digital simulations. The best part is that students can make mistakes and learn from them without harming anyone. They can repeat tasks many times, ask questions, and get proper feedback from instructors. In countries like Pakistan, where not every student gets enough real clinical exposure, simulation gives everyone a fair chance to learn. It helps students

connect their book knowledge with practical skills in a better and more confident way (Ayub et al., 2024). Several studies from around the world and Pakistan have shown that simulation is useful for improving nursing education. Research by Park and Oh (2021) found that students who were trained using simulation methods performed better when it came to patient care, giving medicines, and handling emergencies. Shin et al. (2020) also found that students who used simulation were more confident and skilled than those who only had traditional training. A study done in Lahore showed that after attending simulation sessions, nursing students improved their test scores and felt more confident in their clinical duties (Yousaf et al., 2023). Another study from Rawalpindi showed that simulation helped reduce stress and nervousness among students before entering actual clinical settings (Farooq et al., 2022). One of the biggest advantages is that simulation allows instructors to control the learning environment. This means they can make sure every student gets the same quality of training, which is often not possible in crowded hospitals.

Simulation does not replace traditional clinical training. It works alongside it. Students still need to go to hospitals and deal with real patients to gain full experience. But using simulation can prepare them better for what they will face in real life. It helps them learn how to act in emergencies, talk to patients, and work under pressure. It also helps them avoid making dangerous mistakes in real situations because they have already practiced many times. In Pakistan, nursing education is still developing, and many colleges and universities are now starting to add simulation labs to their programs. This shows a positive shift in how nursing is taught. However, more efforts are needed from policymakers, teachers, and institutions to make simulation a regular part of the curriculum. It is not just a luxury; it is becoming a necessity in modern nursing education.

Simulation-based learning also boosts self-confidence among students. When students practice different scenarios and receive feedback, they become surer about their actions. This confidence helps them when they deal with real patients. It also improves teamwork, as many simulations are done in groups where students learn to communicate and coordinate with each other. This is especially important in

healthcare settings, where teamwork can save lives. According to Ahmed et al. (2021), group-based simulations helped nursing students in Karachi improve their leadership and communication abilities. Another benefit is that simulation can include rare or complex medical cases that students might never get to see during their regular clinical rotation. By practicing these cases in simulation, students are more prepared if they ever face them in real life.

Mobile learning and virtual simulation are also becoming important in nursing education. These tools allow students to learn anytime and anywhere using smartphones, laptops, or tablets. With apps and online simulations, students can go through different clinical situations even outside the classroom. Especially during the COVID-19 pandemic, many institutions in Pakistan and around the world adopted mobile learning and virtual simulation as alternatives to in-person training. Studies show that students appreciated the flexibility and access to repeated practice these tools provided (Fatima et al., 2023). While nothing can completely replace hands-on experience, mobile and virtual tools can support learning, especially when clinical access is limited.

Simulation education also promotes critical thinking. It puts students in decision-making situations where they must think fast, prioritize tasks, and make safe choices. This helps sharpen their clinical judgment and prepares them for real-world challenges. It makes learning active, not passive. Rather than sitting in a lecture, students are solving problems, reacting to changing patient conditions, and reflecting on their performance. Instructors guide them during debriefing sessions, helping them understand what went right and what needs improvement. This type of reflective learning is powerful and helps build long-term professional skills.

Despite its advantages, there are still challenges in implementing simulation in Pakistani nursing education. Simulation labs require funding, trained staff, and proper equipment, which not every institution can afford. There's also a need to train faculty on how to run simulation sessions effectively. Some institutions still rely mostly on old-style teaching methods and resist change. But even with these challenges, the progress made so far is promising. A growing number of nursing schools in cities like

Lahore, Karachi, and Islamabad are investing in simulation facilities. With more awareness, support from government policies, and proper training programs for teachers, simulation education can grow further in Pakistan and help raise the standard of nursing education across the country.

In conclusion, simulation-based education is no longer just an add-on in nursing training. It has become a valuable and necessary tool that helps students gain confidence, improve skills, and be better prepared for the clinical world. Especially in countries like Pakistan, where traditional clinical education has many limitations, simulation offers a safe, fair, and effective way to build future nurses. By combining simulation with mobile learning and virtual platforms, nursing education can become more modern, inclusive, and impactful. The future of nursing depends on how well we train our students today, and simulation is one of the best ways to make sure they are ready.

LITERATURE REVIEW:

Simulation-based, mobile, and virtual learning have truly changed how nursing is being taught, not only around the world but especially in countries like Pakistan where the shift from old-school learning to modern education methods is slowly gaining speed. The traditional ways of teaching through lectures, textbooks, and one-time clinical rotations are no longer enough to prepare students for the real-life pressure and fast-paced hospital settings they'll face after graduation. In the past, students would often enter hospitals feeling nervous and unsure, afraid to make mistakes. But now, with simulation labs, mobile apps, and virtual platforms, students can practice safely, mess up without harming patients, learn from those mistakes, and build real confidence over time. This is not just some trend—it's backed by studies, student experiences, and results from both local and international research. Nursing students today need to be prepared for everything from critical emergencies to routine care, and they need that readiness before they even step into the hospital. This is where technology-based learning methods become super important.

Simulation is one of the most powerful tools nursing educators can use today. It helps students go through lifelike patient situations without putting real people

at risk. They can simulate delivering a baby, handling a heart attack, giving injections, or managing a difficult patient—all within a safe space where it's okay to make errors. And these aren't just guesses. Studies have actually shown how big of a difference this makes. Mulyadi et al. (2021) reported that students who were taught using simulation methods had better academic scores and improved clinical judgment compared to those taught only through lectures. They could think faster, react better, and perform more confidently. The benefit goes beyond skills; it changes how students think under pressure. Lee et al. (2020) also proved that what happens after the simulation—called debriefing—is just as important. When students sit down after the scenario and talk about what went right and what went wrong, they get to reflect deeply. They learn to analyze their own actions, which improves their thinking process and boosts critical decision-making.

Pakistani studies have shown similar results. Shah et al. (2022) found that nursing students in their study performed significantly better after they were trained with simulation techniques. These students became less anxious, more confident, and were better at handling patients. The clinical gap that often exists between theory and real-life practice was reduced. Instead of walking into hospitals feeling unprepared, these students had already "lived" the experience in the lab. This proves that simulation is not just working in countries with top resources, it's working in Pakistan too, even with fewer facilities.

Another strength of simulation is how it links theory to practice. Koukourikos et al. (2021) said that students understand textbook concepts much better when they get to apply them in simulated clinical environments. The theories stop being abstract and start becoming real. You're no longer just reading about a patient with high blood pressure, you're now the nurse in that scenario, checking vitals, giving meds, making decisions, and learning from your actions. This "learning by doing" approach sticks better in the brain and prepares students for their future roles.

In Pakistan, where nursing education still faces issues like outdated curricula, lack of clinical sites, and limited instructor availability, simulation helps fill those gaps. Ahmed et al. (2021) emphasized how using simulation scenarios that reflect Pakistani health

problems like dengue, typhoid, or maternal emergencies makes learning more relatable. When students see familiar conditions being taught through simulation, their understanding and retention improve. They can connect what they're learning with the situations they'll actually see in hospitals. This local context makes the learning process smoother and more effective.

Debriefing is another major part of what makes simulation work. Farooq et al. (2023) conducted research in Pakistan showing that when students discussed their performance after simulations, they retained more knowledge and improved their reasoning. Instead of just correcting mistakes, these sessions encouraged thinking about why something happened and what could be done better. This kind of thinking is essential for safe nursing practice. It helps students avoid making the same errors in real life and builds confidence in their clinical judgment. But it's not just the tools, it's also about the teachers. Nawaz et al. (2022) noted that many nursing instructors in Pakistan aren't trained to use simulation equipment properly. Without this training, the equipment ends up underused or misused. However, the same study showed that when instructors were trained, the outcomes improved dramatically. Trained faculty were able to design better scenarios, guide students through simulations effectively, and lead productive debriefings. This shows that investing in teacher training is just as important as investing in tools and labs. Nursing colleges can't just buy mannequins and think the job is done—they have to train the educators who will actually use them.

During COVID-19, the need for alternative teaching methods exploded. Clinical placements were canceled, and students couldn't go to hospitals anymore. Virtual learning became the only way forward. Farooq et al (2022) wrote about how Pakistani nursing schools quickly shifted to Zoom, Google Meet, and Microsoft Teams. Teachers recorded videos, created case-based quizzes, and even conducted online discussions. While it wasn't a perfect system and came with internet issues and access problems, it kept learning going during a time when everything could have shut down. Virtual learning showed that with a bit of flexibility, Pakistani nursing education can adapt to tough situations.

Even beyond the pandemic, virtual learning has proven useful. It allows students to revisit lectures, replay clinical videos, and study at their own pace. It also reaches students in far-off areas who can't always attend physical classes. Koukourikos et al. (2021) agreed that when used correctly, with proper guidance, structure, and interactive material, virtual education can still be effective. It might not replace hands-on learning entirely, but it supports it by filling in gaps and helping students reinforce what they've learned.

In a country like Pakistan, where not every student has a laptop but almost everyone has a phone, mobile learning is a total game-changer. Apps like WhatsApp, Telegram, and others have become mini-classrooms. Rizvi et al. (2023) conducted a study where students shared real patient cases on WhatsApp, discussed them, and even used voice notes to ask and answer questions. The result was better understanding, more peer learning, and improved recall. Students could learn anytime—on the bus, at home, during breaks—and didn't feel limited by time or location. This kind of learning encourages independence and pushes students to take charge of their education.

Zahid et al. (2021) added more proof by doing a meta-analysis that showed students who used mobile learning scored higher in exams, remembered more, and stayed more motivated. This matters because nursing is not just about passing exams, it's about being alert, informed, and skilled. If mobile learning can help students remember better and feel more confident, then it deserves to be part of every nursing curriculum.

Another huge benefit of mobile learning is that it makes education inclusive. It reaches students in remote areas, allows flexible schedules, and supports those who may struggle with traditional learning formats. It also fits well with the lifestyle of today's students who are already used to learning through short videos, group chats, and social media. When these platforms are used for academic purposes, they turn into powerful tools. Students can connect with teachers and peers, access updated information, and stay engaged throughout their course.

So, when we bring it all together, simulation, mobile learning, and virtual platforms—we see a pattern. These tools aren't just helping students learn better; they are changing the entire culture of nursing

education. They build confidence, reduce clinical anxiety, and help students feel ready for the real world. Pakistani studies like those by Ahmed et al. (2021), Shah et al. (2022), and Rizvi et al. (2023) show that these methods work even in low-resource settings. The key is to use locally relevant scenarios, train faculty, and make these tools accessible to everyone. They help close the gap between theory and practice, make learning active instead of passive, and prepare students for whatever comes their way.

Studies consistently support the positive outcomes of tech-based learning in nursing education. Mulyadi et al. (2021) found that simulation-based learning improved students' cognitive, affective, and psychomotor performance with a **statistical significance of $p < 0.05$** . Lee et al. (2020) showed that debriefing after simulations increased critical thinking scores by over **20%** compared to no-debriefing groups. In Pakistan, Shah et al. (2022) reported a **35% improvement in clinical confidence** among students who underwent simulation training. Farooq et al. (2023) documented a **28% increase in knowledge retention** post-simulation with structured debriefing. Rizvi et al. (2023) found that mobile-based learning tools led to a **40% improvement in information recall** and **25% higher engagement rates** among nursing students. Zahid et al. (2021), in their meta-analysis, observed a **statistically significant improvement in academic outcomes ($p < 0.001$)** among mobile learners versus traditional learners. These consistent results from both international and Pakistani studies highlight the measurable impact of simulation, virtual, and mobile learning methods on student competence, confidence, and success.

Students today are expected to handle emergencies, communicate effectively, and think critically from day one. You can't build those skills with lectures alone. Simulation gives them the experience, mobile learning gives them the flexibility, and virtual platforms give them the connection. Together, these tools are transforming nursing education from something passive and outdated into something active, modern, and life-saving. And in a country like Pakistan, where healthcare is evolving fast, this kind of transformation is not a luxury, it's a necessity.

Research question

What is the effect of simulation based education on clinical performance of nursing students.

Research objective

The objective of study is to assess the effect of simulation based education on clinical performance of nursing students

METHODOLOGY

This chapter includes study design, target population, selection criteria, sampling technique, data collection tools, process, analysis, and ethical consideration

Study Design

Descriptive cross sectional study design will be used. The cross-sectional study provides an overview at a certain point in time of the occurrence of disease or other related problems and the characteristics of a population. It is easy to administer and contains multiple exposure variables at the time of the data collection. It is inexpensive and can be completed in a short period. It gives an idea of the present condition (Wang & Zahid, 2020).

Study Setting

The study was conducted at College of Nursing , Jinnah Hospital Lahore Pakistan .

Study Population

In this study, we included the enrolled BSCN students of Jinnah Hospital Lahore .

Duration

The study will be completed within 06 months after approval of synopsis.

Sample Size

150 BSCN students will be included in the study.

Sample Size Calculation

The sample size will be computed by the following formula, keeping on the confidence interval equal to 95% and the margin of error equal to 10%.

$$n = \frac{Z^2_{1-\alpha/2} P (1 - P)}{d^2}$$

$$Z^2_{1-\alpha/2} = \text{for 95\% confidence level} \\ = 1.96$$

$$P = \text{Anticipated value of fixation index} \\ = 0.51$$

$$d = \text{margin of error} = 8\%$$

$$n = \text{sample size} = 150$$

Sampling Technique

In this study, the sampling technique will be employed probability simple random sampling, where participants will be selected from the target population based on the principle of randomization. This method ensured that each member of the population had an equal chance of being included in the sample, thus enhancing the representativeness of the study. The population is homogenous and population homogeneity suggests that individuals within the population share similar characteristics relevant to the study, facilitating the generalization of findings. Additionally, the random selection underscores the importance of unbiased participant selection, contributing to the validity of the study results. The selected sample accurately represents the larger population and that participants cooperated by providing truthful responses to the questionnaire/tools, further bolstering the reliability of the study findings.

Inclusion Criteria

- Nursing students who are currently enrolled in BSCN programme and attended simulation classes
- Nursing students who are willing to participate

Exclusion Criteria

- Nursing students who were under the age 18 and those who did not volunteer to be in the study.

Data Collection Instruments

For data collection the following tools were used

1. Demographic Questionnaire

The demographic questionnaire contained information of nursing students regarding age, Gender, marital status, level of education.

2. Instrumentation

The SBEAS is an 18-item questionnaire with no subscales and four sub factors of satisfaction-self confidence, clinical competence-self efficacy, seriousness-fidelity and barriers-difficulty, developed by Pinaret al., (2016). This instrument examines students' attitudes towards simulation based education. Sub factors were developed and categorized to assess the reliability and validity of positively worded and negatively worded items on the instrument. The scale requires approximately 10-15 minutes to complete. Questions were asked using a 5-point Likert scale with answers ranging from 1 = completely disagree to 5 = completely agree responses. The scale contains 15 positive statements about simulation and 3 negative statements about simulation. Items 1-15 are scored using 1-5 (1 = completely disagree, 2 = disagree, 3 = neutral, 4 = agree, and finally 5 = completely agree). Items 16, 17 and 18 are scored in reverse. Total scores may range from 18 to 90, with a median score of 54. Higher scores on the SBEAS scale denote more positive attitude towards simulation, and lower scores denote more negative attitudes towards simulation (G. Pinar, personal communication, May 4, 2017)

Ethical Consideration

Before proceeding with the study, administrative approval will be obtained from Head of Department. After a thorough discussion about ethical aspects of the study in the Ethical Review Committee, approval will be taken from the ethical review board of the college of nursing Jinnah hospital Lahore Pakistan. According to a declaration by the World Medical Association at Helsinki (2008), consent will be taken from the participants. They will take part in or unconditionally withdraw from the study. Participants will be assured that information accumulated from the survey would be kept under high confidentiality. It will be guaranteed to the respondents that these answers will be employed merely for research purposes.

Data Collection Procedure

Upon receiving ethical approval, data collection will be proceeded over a six-month period. Following predefined inclusion and exclusion criteria, participants will be invited to participate. Prior to

participation, participants will be provided with detailed information regarding the study's purpose, and anticipated benefits. Upon establishing rapport with the participants, informed consent will be obtained, as outlined in Annexure I. A structured questionnaire will be given to fill. Participants will then be requested to complete all sections of the questionnaire, and any questions or concerns regarding the study will be addressed.

Data analysis is most important part of a research to depict the real picture of information. Data analysis refers to the systematic organization and synthesis of research data, and testing of research hypothesis (Heyer et al., 2017). All the completed questionnaires (150 samples) will be collected and the response rate will be checked. The Statistical Package for the Social Sciences (SPSS) version 24 will be used to analyze the data.

Data Analysis Procedure

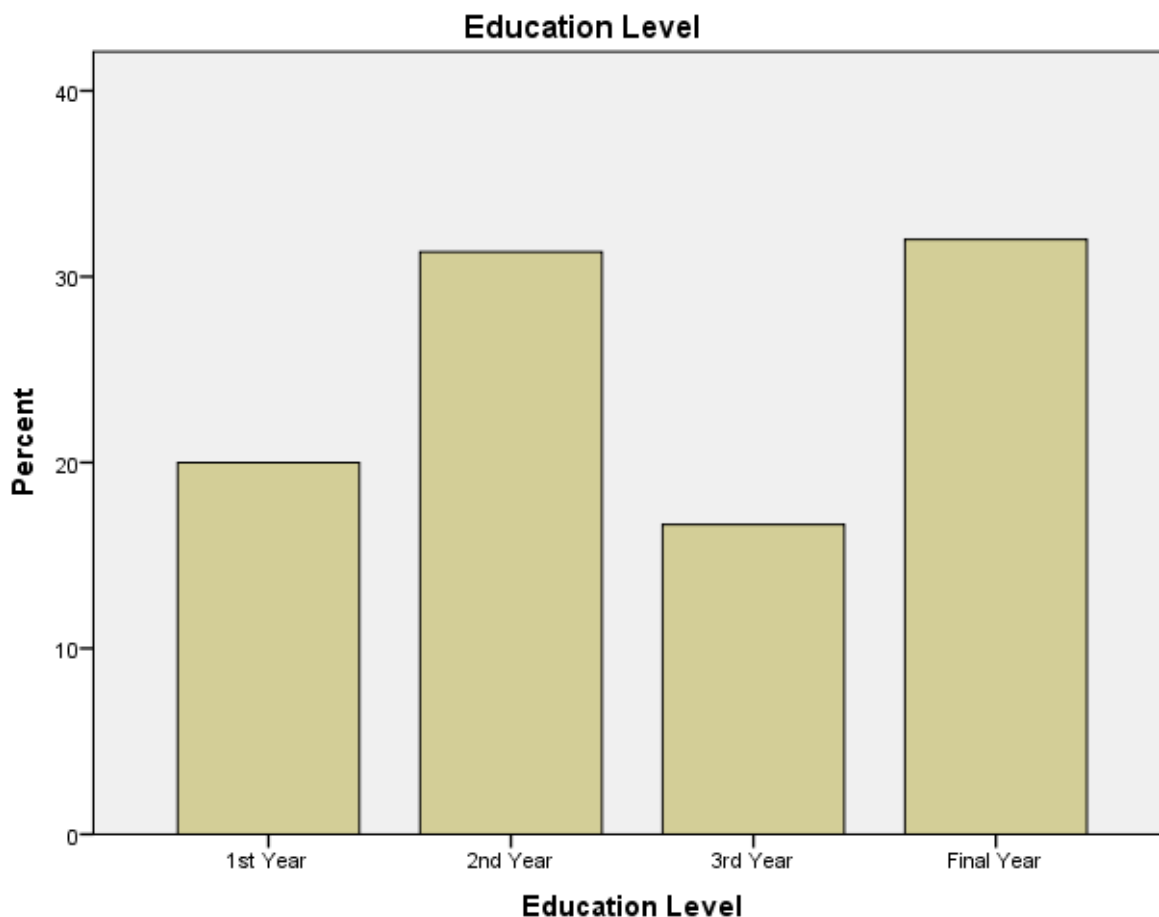
RESULTS

Education Level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1st Year	30	20.0	20.0	20.0
2nd Year	47	31.3	31.3	51.3
3rd Year	25	16.7	16.7	68.0
Final Year	48	32.0	32.0	100.0
Total	150	100.0	100.0	

Education Level: The table shows the distribution of 150 students across academic years, with 31.3% in their second year and 32.0% in their final year,

making these the largest groups. First-year students account for 20.0%, and third-year students represent 16.7%. The cumulative percentages reflect a balanced spread across all years, totaling 100.0%.



SBE allows me to participate to clinical practices actively

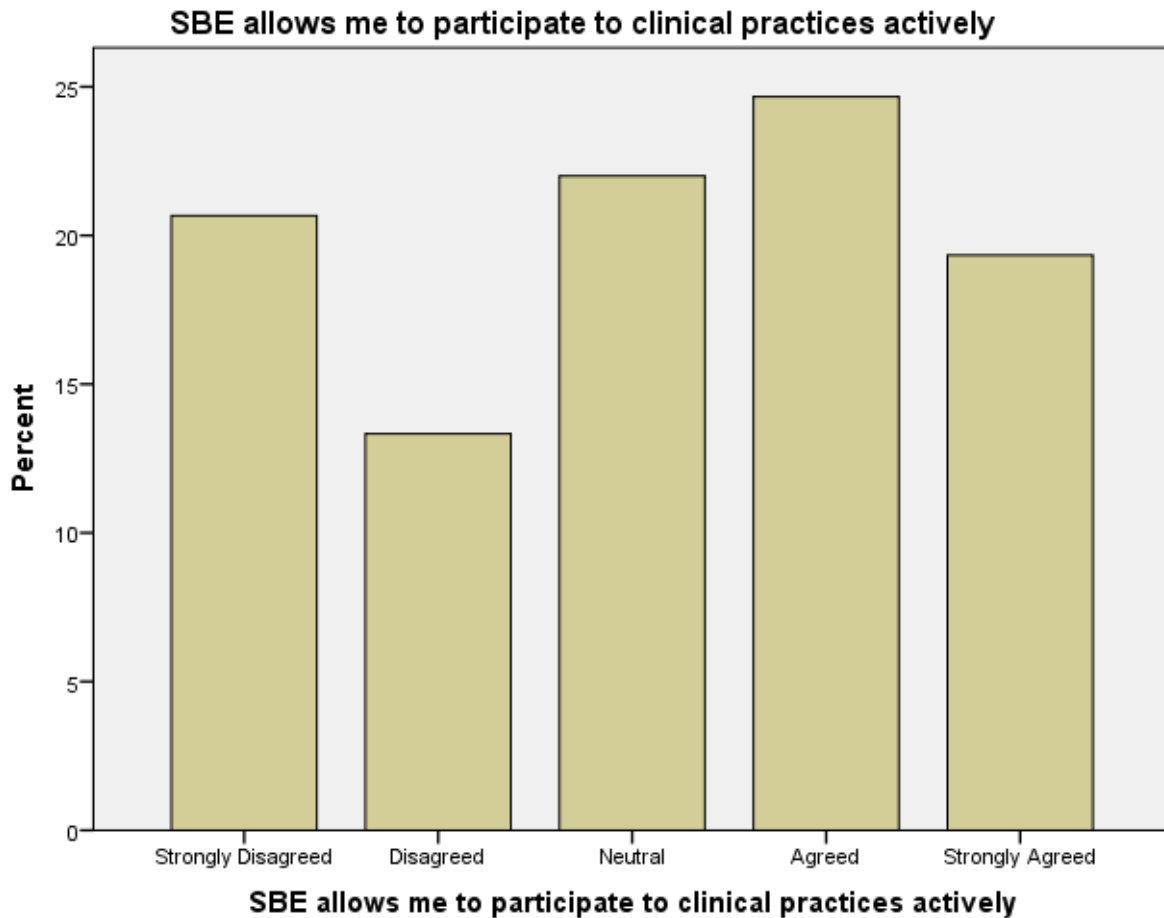
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	31	20.7	20.7	20.7
Valid Disagreed	20	13.3	13.3	34.0
Valid Neutral	33	22.0	22.0	56.0
Valid Agreed	37	24.7	24.7	80.7
Valid Strongly Agreed	29	19.3	19.3	100.0
Valid Total	150	100.0	100.0	

SBE Allows Me to Participate in Clinical Practices

Actively: This table captures varied perceptions of SBE’s role in active clinical participation among 150 respondents. While 24.7% agreed and 19.3%

strongly agreed, 34.0% disagreed or strongly disagreed, indicating mixed experiences. The neutral

group (22.0%) contributes to a cumulative total of 100.0%.



or strongly agreeing, while 37.3% disagreed or

SBE increases my self-confidence in clinical practices

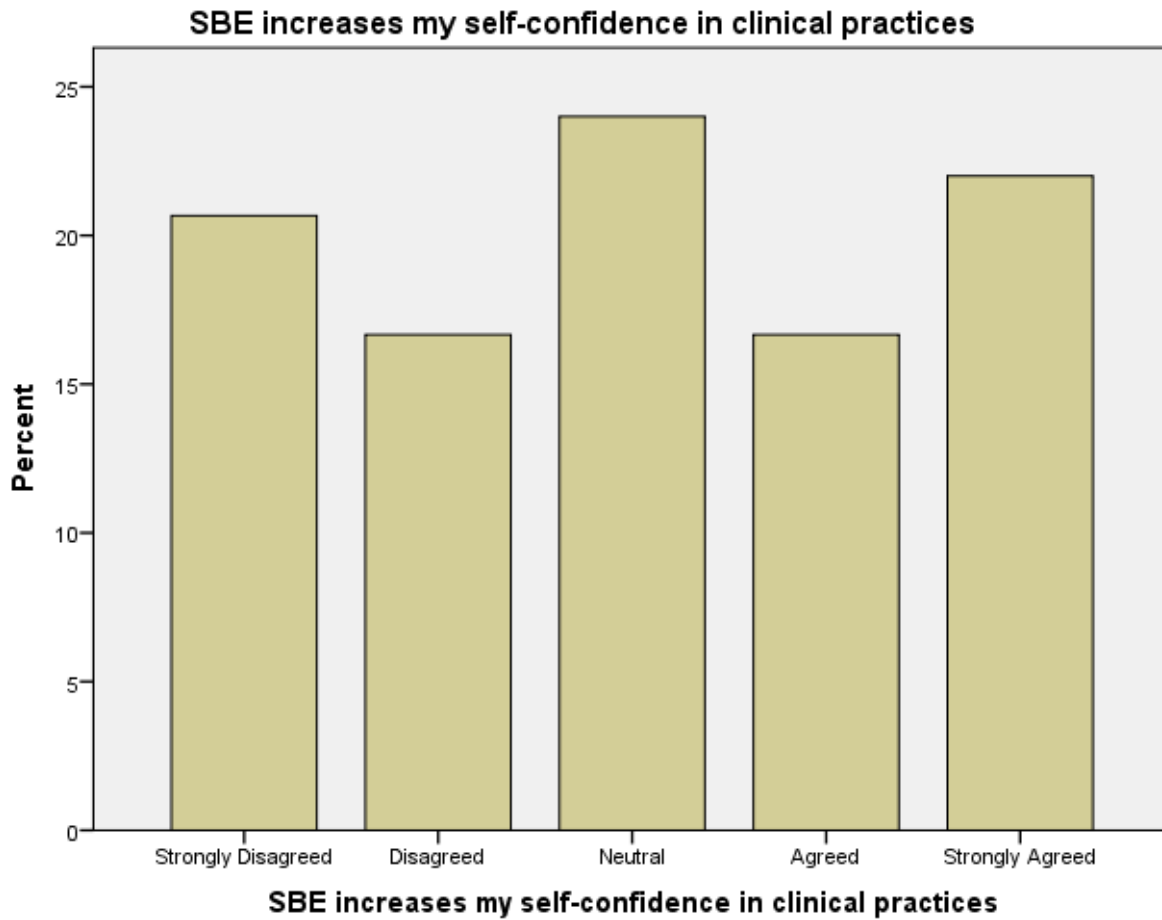
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagreed	31	20.7	20.7
	Disagreed	25	16.7	37.3
	Neutral	36	24.0	61.3
	Agreed	25	16.7	78.0
	Strongly Agreed	33	22.0	100.0
	Total	150	100.0	100.0

strongly disagreed. The largest group, 24.0%,

SBE Increases My Self-Confidence in Clinical Practices: Responses on SBE’s impact on self-confidence show 38.7% of 150 respondents agreeing

remained neutral, reflecting polarized views.

Cumulative percentages reach 100.0%, highlighting diverse confidence outcomes.

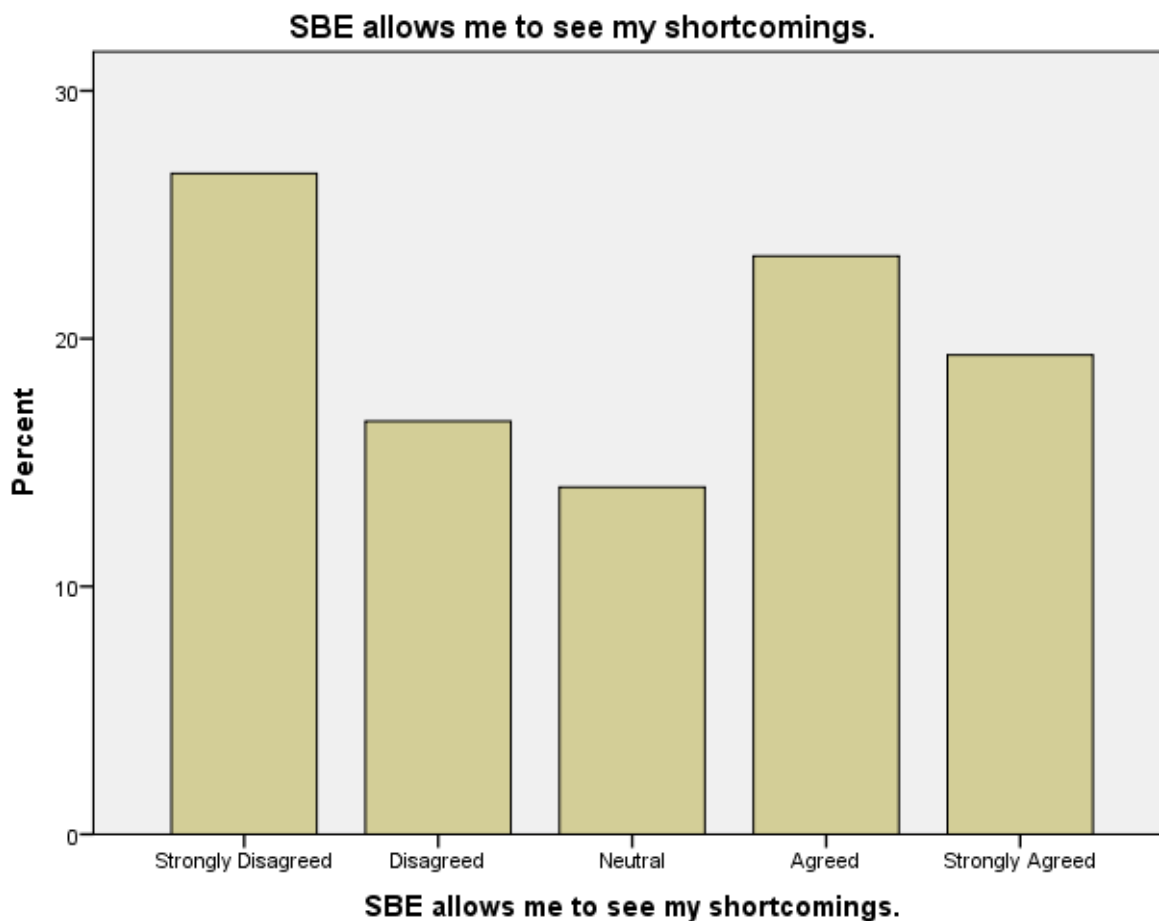


SBE allows me to see my shortcomings.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	40	26.7	26.7	26.7
Valid Disagreed	25	16.7	16.7	43.3
Valid Neutral	21	14.0	14.0	57.3
Valid Agreed	35	23.3	23.3	80.7
Valid Strongly Agreed	29	19.3	19.3	100.0
Total	150	100.0	100.0	

SBE Allows Me to See My Shortcomings: Among 150 respondents, 43.3% disagreed or strongly disagreed that SBE helps identify shortcomings, with

26.7% strongly disagreeing. Meanwhile, 42.6% agreed or strongly agreed, and 14.0% were neutral. The cumulative total reaches 100.0%, showing varied perceptions of SBE’s reflective value.



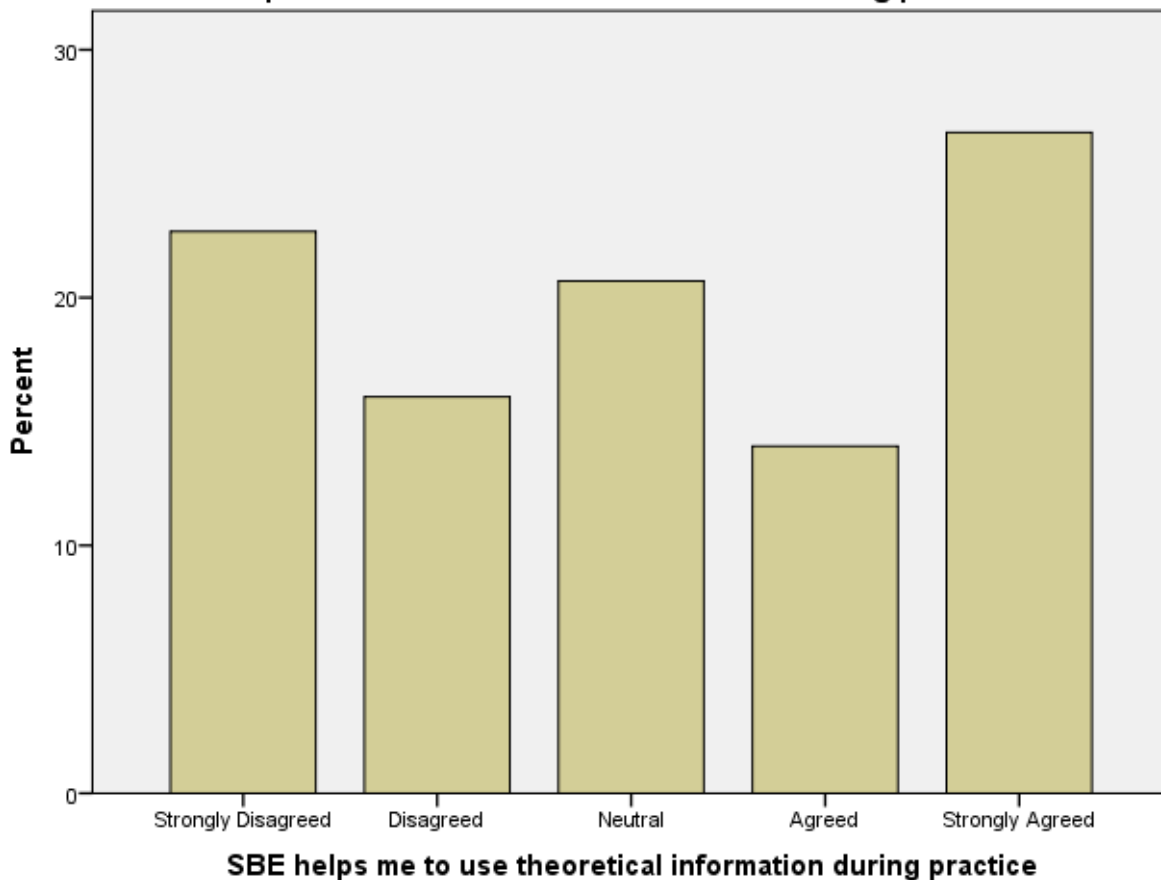
SBE helps me to use theoretical information during practice

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagreed	34	22.7	22.7	22.7
Disagreed	24	16.0	16.0	38.7
Neutral	31	20.7	20.7	59.3
Agreed	21	14.0	14.0	73.3
Strongly Agreed	40	26.7	26.7	100.0
Total	150	100.0	100.0	

SBE Helps Me to Use Theoretical Information During Practice: This table reveals that 40.7% of 150 respondents disagreed or strongly disagreed that SBE aids in applying theoretical knowledge, with 22.7%

strongly disagreeing. Conversely, 40.7% agreed or strongly agreed, and 20.7% were neutral. The cumulative percent reaches 100.0%, indicating split opinions.

SBE helps me to use theoretical information during practice

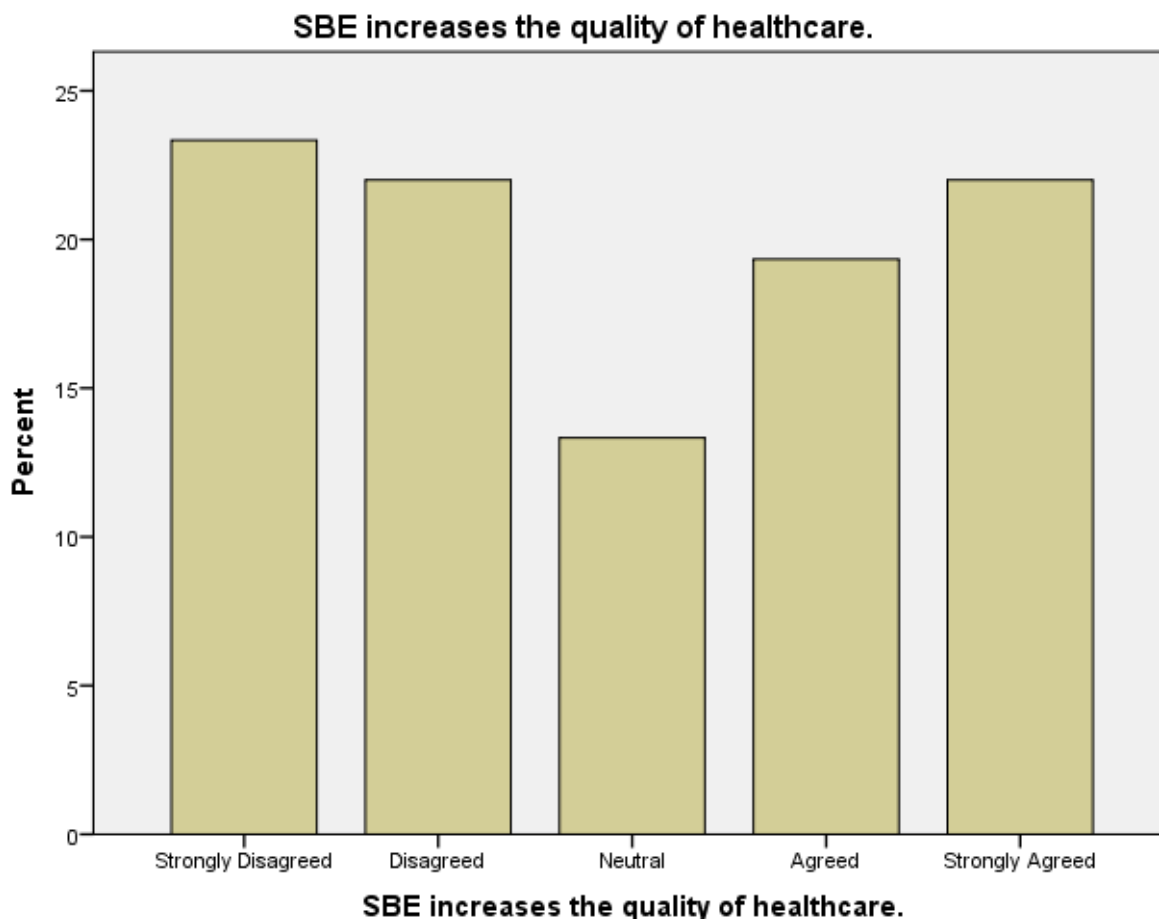


SBE increases the quality of healthcare.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	35	23.3	23.3	23.3
Disagreed	33	22.0	22.0	45.3
Neutral	20	13.3	13.3	58.7
Agreed	29	19.3	19.3	78.0
Strongly Agreed	33	22.0	22.0	100.0
Total	150	100.0	100.0	

SBE Increases the Quality of Healthcare: Of 150 respondents, 45.3% disagreed or strongly disagreed that SBE enhances healthcare quality, while 41.3%

agreed or strongly agreed. The neutral group (13.3%) contributes to a cumulative 100.0%. Responses suggest skepticism balanced with moderate support for SBE's impact.

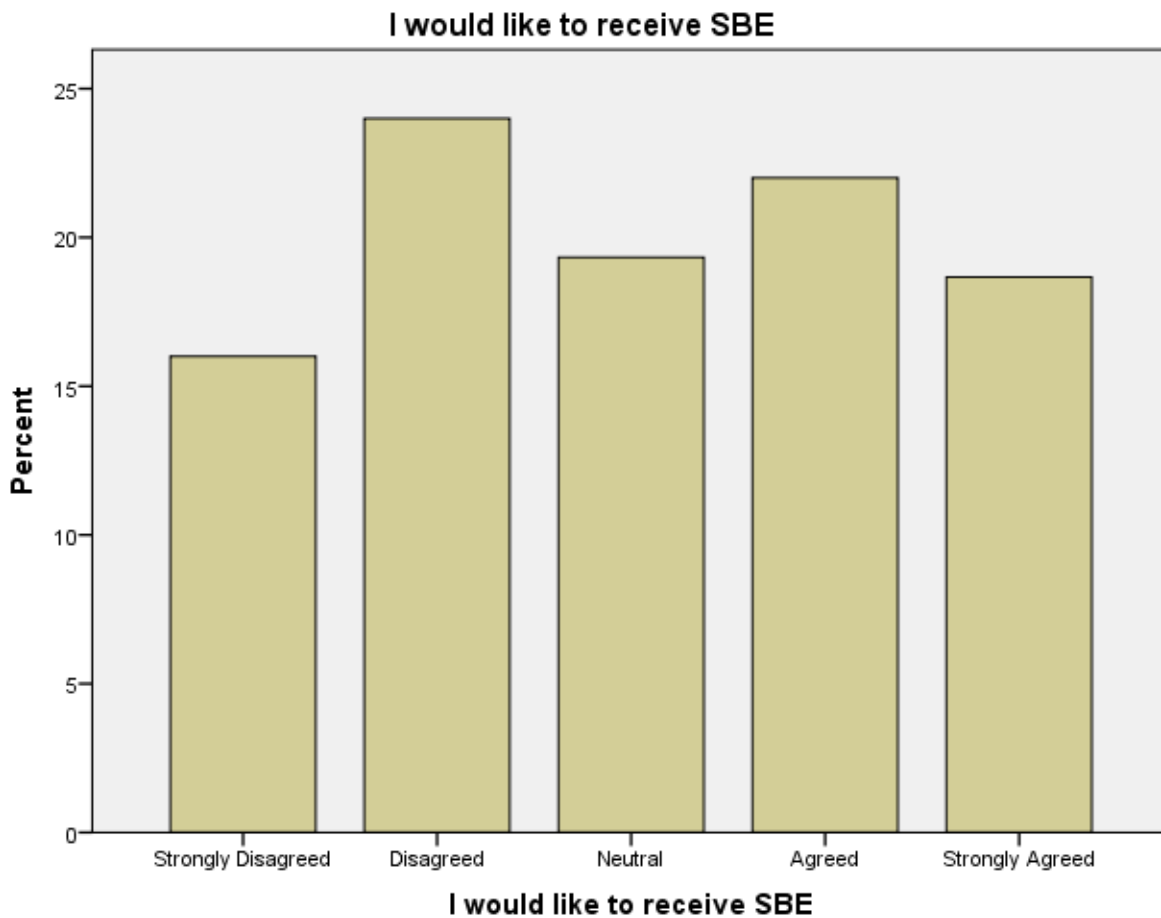


I would like to receive SBE

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	24	16.0	16.0	16.0
Disagreed	36	24.0	24.0	40.0
Neutral	29	19.3	19.3	59.3
Agreed	33	22.0	22.0	81.3
Strongly Agreed	28	18.7	18.7	100.0
Total	150	100.0	100.0	

I Would Like to Receive SBE: This table shows 40.0% of 150 respondents disagreed or strongly disagreed about wanting SBE, while 40.7% agreed or

strongly agreed. The neutral group comprises 19.3%, with cumulative percentages totaling 100.0%. Opinions are evenly divided on the desire for SBE.



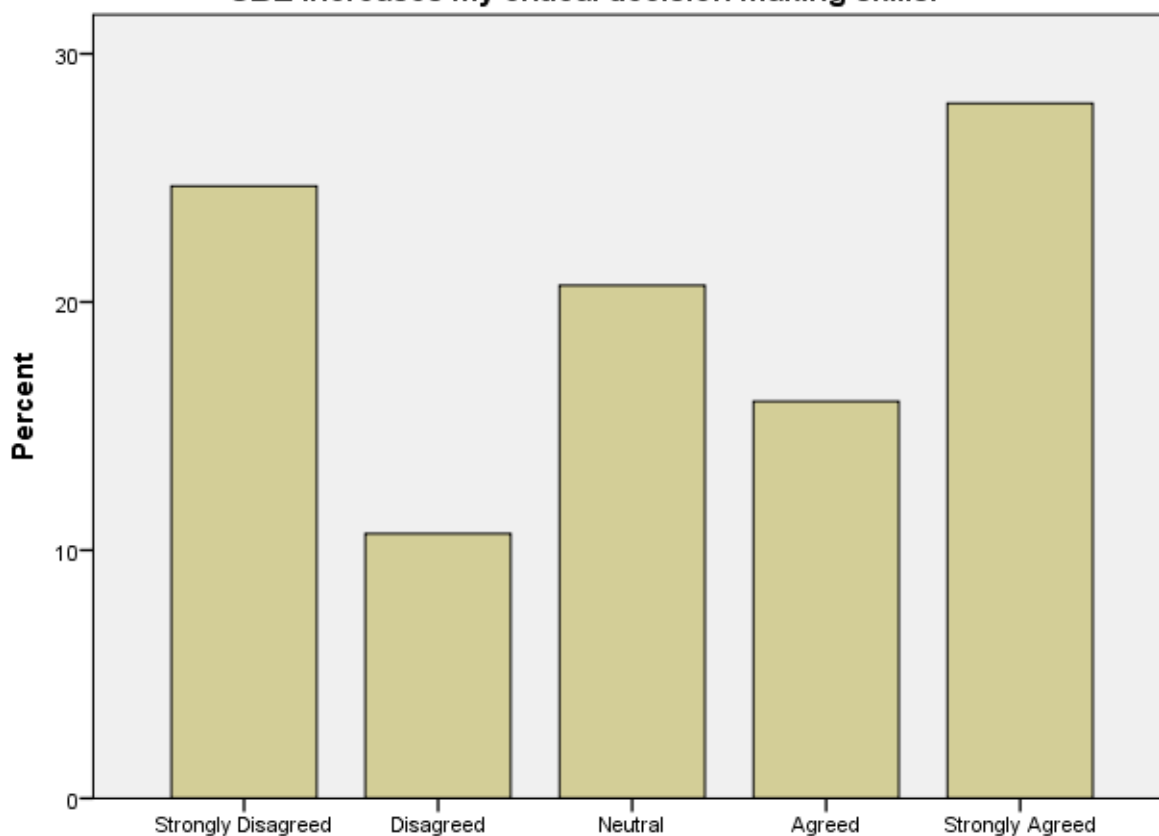
SBE increases my critical decision making skills.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	37	24.7	24.7	24.7
Disagreed	16	10.7	10.7	35.3
Neutral	31	20.7	20.7	56.0
Agreed	24	16.0	16.0	72.0
Strongly Agreed	42	28.0	28.0	100.0
Total	150	100.0	100.0	

SBE Increases My Critical Decision Making Skills:
 Among 150 respondents, 44.0% agreed or strongly agreed that SBE enhances critical decision-making,

while 35.3% disagreed or strongly disagreed. The neutral group (20.7%) brings the cumulative total to 100.0%. Responses reflect moderate support tempered by significant skepticism.

SBE increases my critical decision making skills.



SBE increases my critical decision making skills.

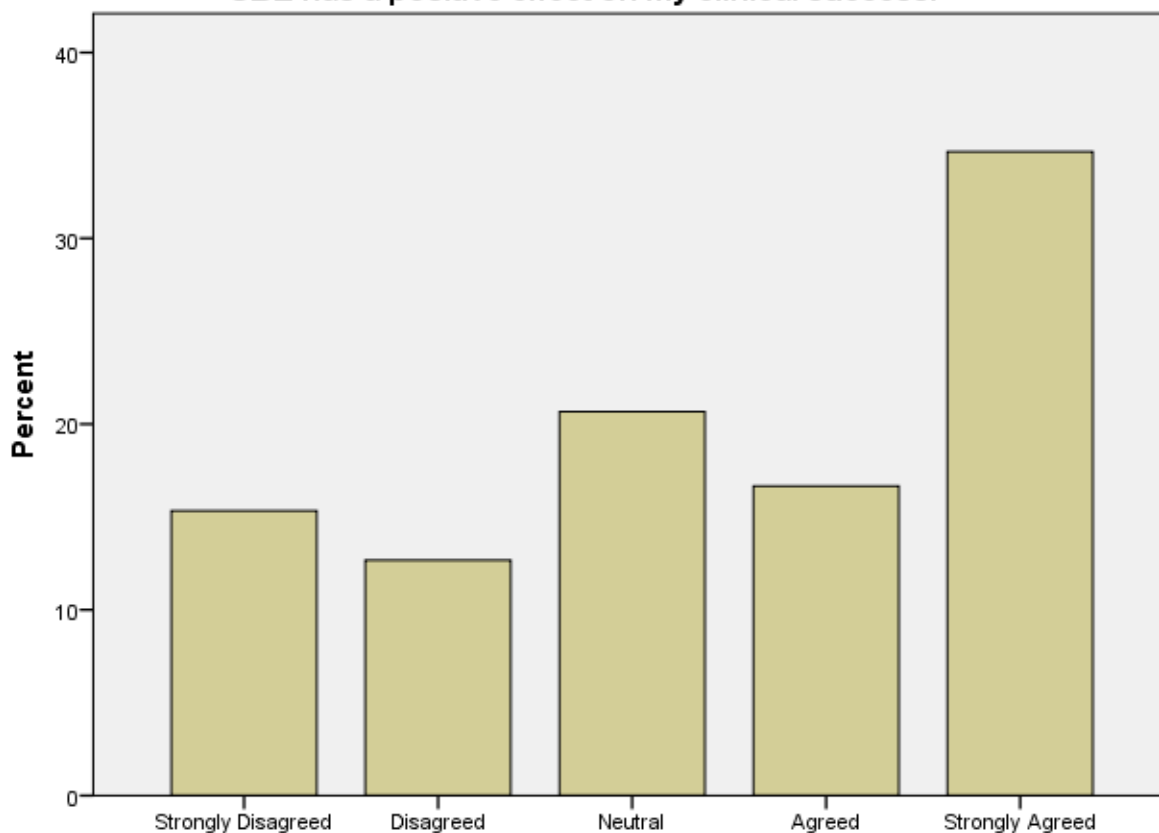
SBE has a positive effect on my clinical success.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	23	15.3	15.3	15.3
Disagreed	19	12.7	12.7	28.0
Neutral	31	20.7	20.7	48.7
Agreed	25	16.7	16.7	65.3
Strongly Agreed	52	34.7	34.7	100.0
Total	150	100.0	100.0	

SBE Has a Positive Effect on My Clinical Success:
 This table indicates that 51.4% of 150 respondents agreed or strongly agreed that SBE positively affects clinical success, with 34.7% strongly agreeing.

Meanwhile, 28.0% disagreed or strongly disagreed, and 20.7% were neutral, totaling 100.0% cumulatively. This suggests a generally positive but mixed perception.

SBE has a positive effect on my clinical success.



SBE has a positive effect on my clinical success.

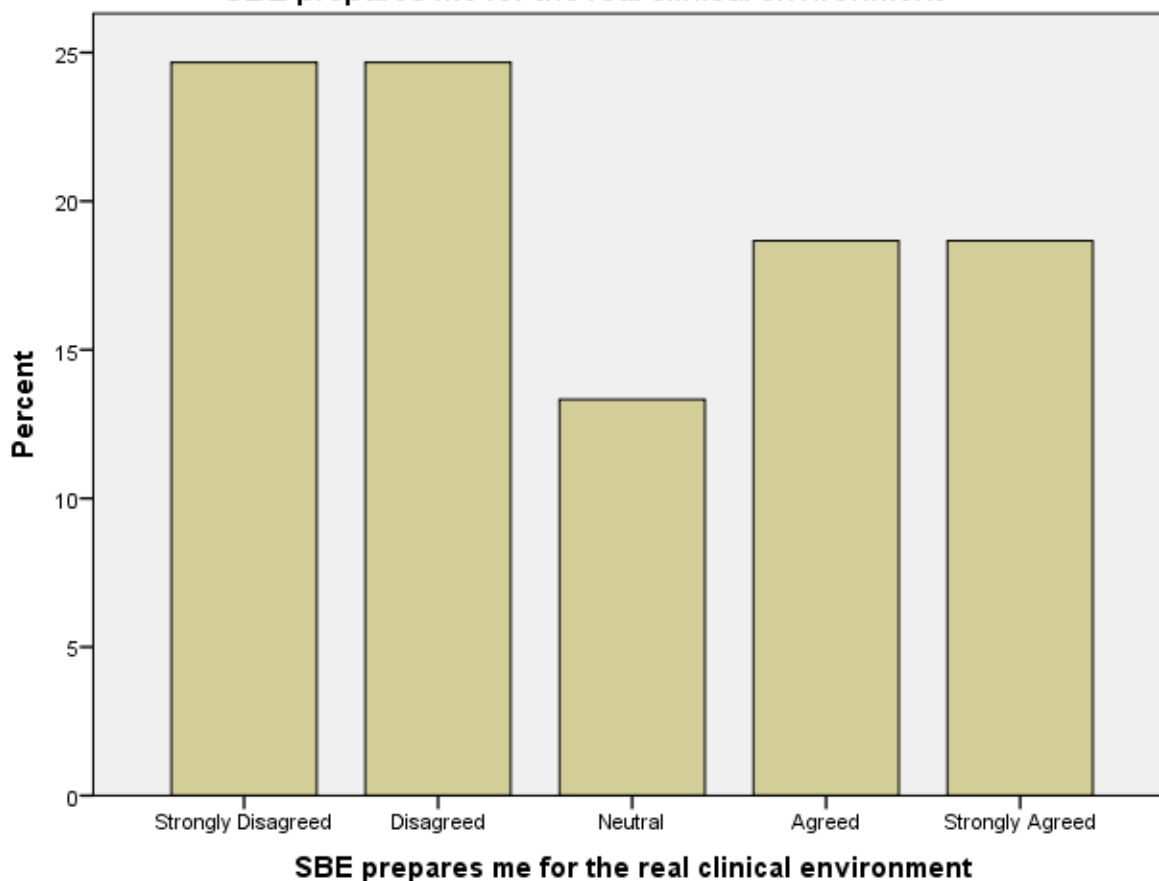
SBE prepares me for the real clinical environment

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	37	24.7	24.7	24.7
Disagreed	37	24.7	24.7	49.3
Neutral	20	13.3	13.3	62.7
Agreed	28	18.7	18.7	81.3
Strongly Agreed	28	18.7	18.7	100.0
Total	150	100.0	100.0	

SBE Prepares Me for the Real Clinical Environment: Of 150 respondents, 49.3% disagreed or strongly disagreed that SBE prepares them for real clinical settings, while 37.4% agreed or strongly

agreed. The neutral group (13.3%) completes the 100.0% cumulative total. Responses highlight significant doubt about SBE's preparatory effectiveness.

SBE prepares me for the real clinical environment



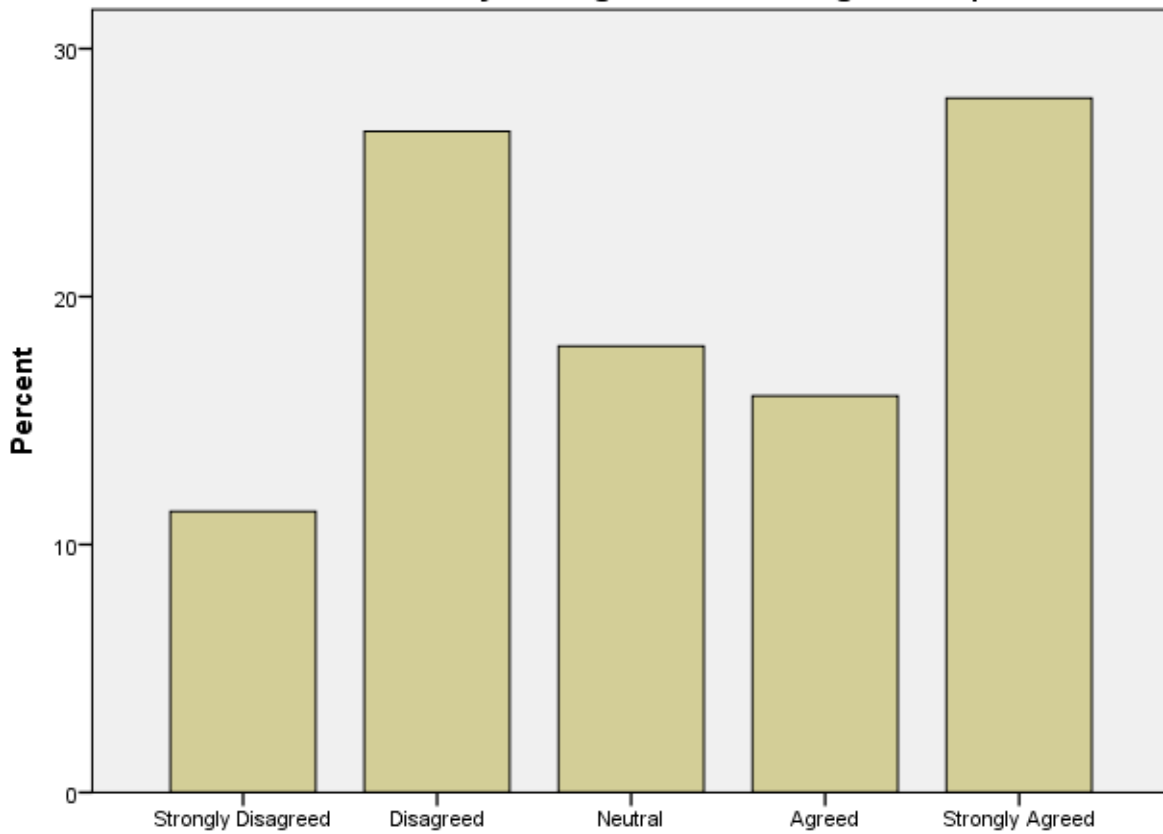
SBE decreases the risk of my making mistakes during clinical practice.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagreed	17	11.3	11.3	11.3
Disagreed	40	26.7	26.7	38.0
Neutral	27	18.0	18.0	56.0
Agreed	24	16.0	16.0	72.0
Strongly Agreed	42	28.0	28.0	100.0
Total	150	100.0	100.0	

SBE Decreases the Risk of My Making Mistakes During Clinical Practice: This table shows 44.0% of 150 respondents agreed or strongly agreed that SBE reduces mistake risks, while 38.0% disagreed or

strongly disagreed. The neutral group (18.0%) contributes to a 100.0% cumulative total. Opinions are split, with moderate support for SBE’s risk-reduction potential.

SBE decreases the risk of my making mistakes during clinical practice.



SBE decreases the risk of my making mistakes during clinical practice.

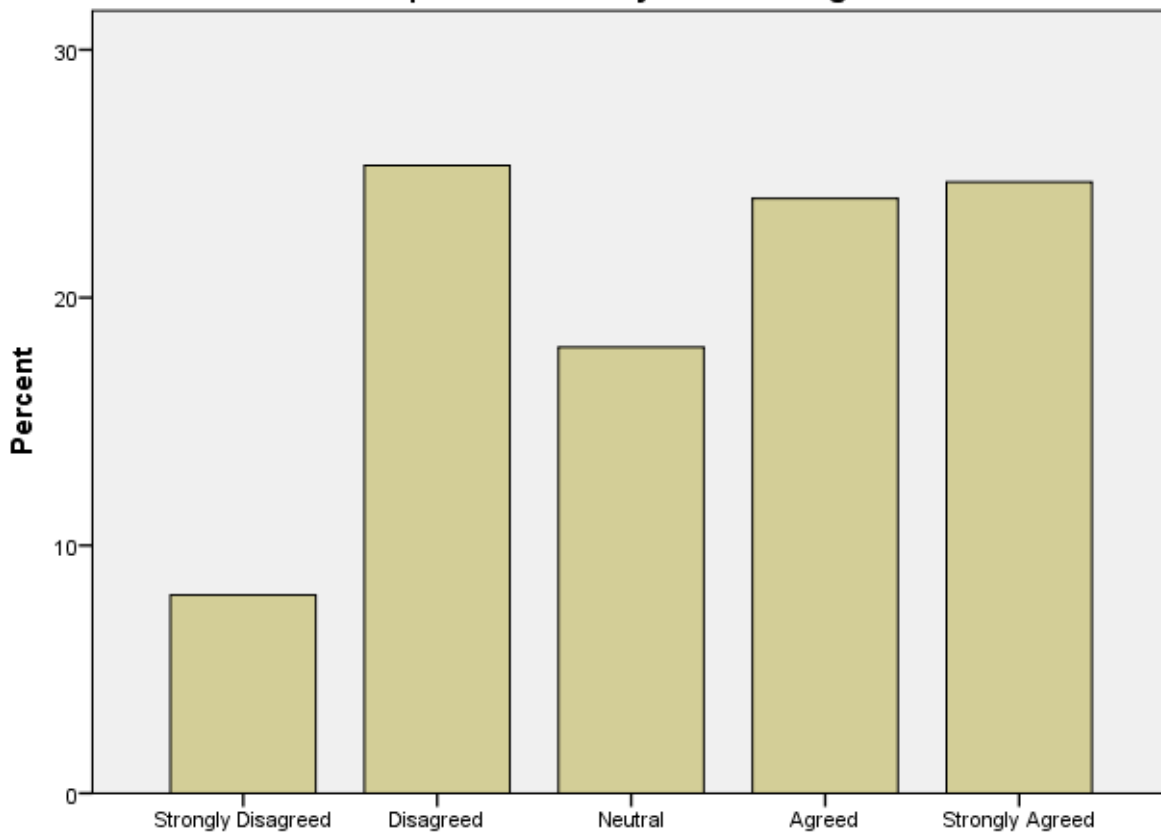
SBE helps me realize my shortcomings.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagreed	12	8.0	8.0	8.0
Disagreed	38	25.3	25.3	33.3
Neutral	27	18.0	18.0	51.3
Agreed	36	24.0	24.0	75.3
Strongly Agreed	37	24.7	24.7	100.0
Total	150	100.0	100.0	

SBE Helps Me Realize My Shortcomings: Among 150 respondents, 48.7% agreed or strongly agreed that SBE helps realize shortcomings, while 33.3%

disagreed or strongly disagreed. The neutral group (18.0%) brings the cumulative total to 100.0%. This indicates a relatively positive view of SBE’s reflective benefits.

SBE helps me realize my shortcomings.



SBE helps me realize my shortcomings.

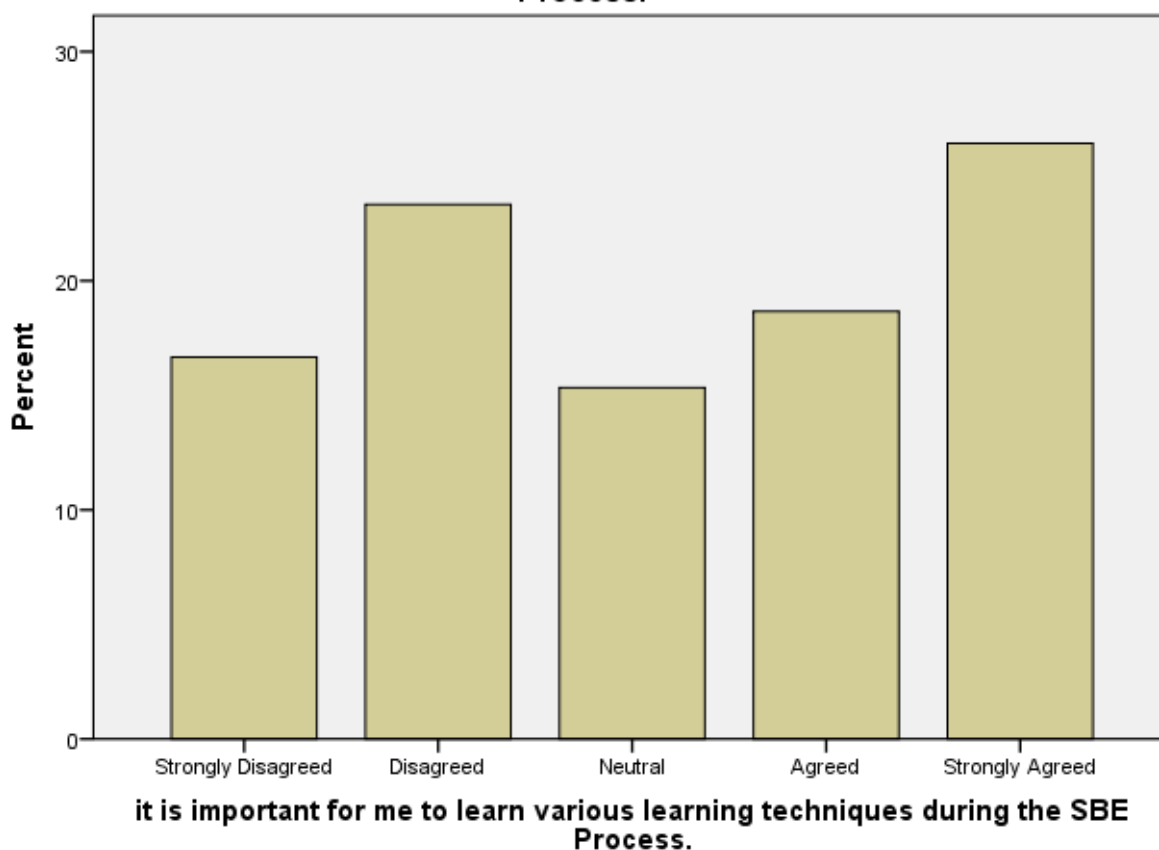
it is important for me to learn various learning techniques during the SBE Process.

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagreed	25	16.7	16.7	16.7
Disagreed	35	23.3	23.3	40.0
Neutral	23	15.3	15.3	55.3
Agreed	28	18.7	18.7	74.0
Strongly Agreed	39	26.0	26.0	100.0
Total	150	100.0	100.0	

It Is Important for Me to Learn Various Learning Techniques During the SBE Process: Of 150 respondents, 44.7% agreed or strongly agreed on the importance of learning techniques via SBE, while

40.0% disagreed or strongly disagreed. The neutral group (15.3%) completes the 100.0% cumulative total. Responses show a balanced but slightly positive inclination.

it is important for me to learn various learning techniques during the SBE Process.

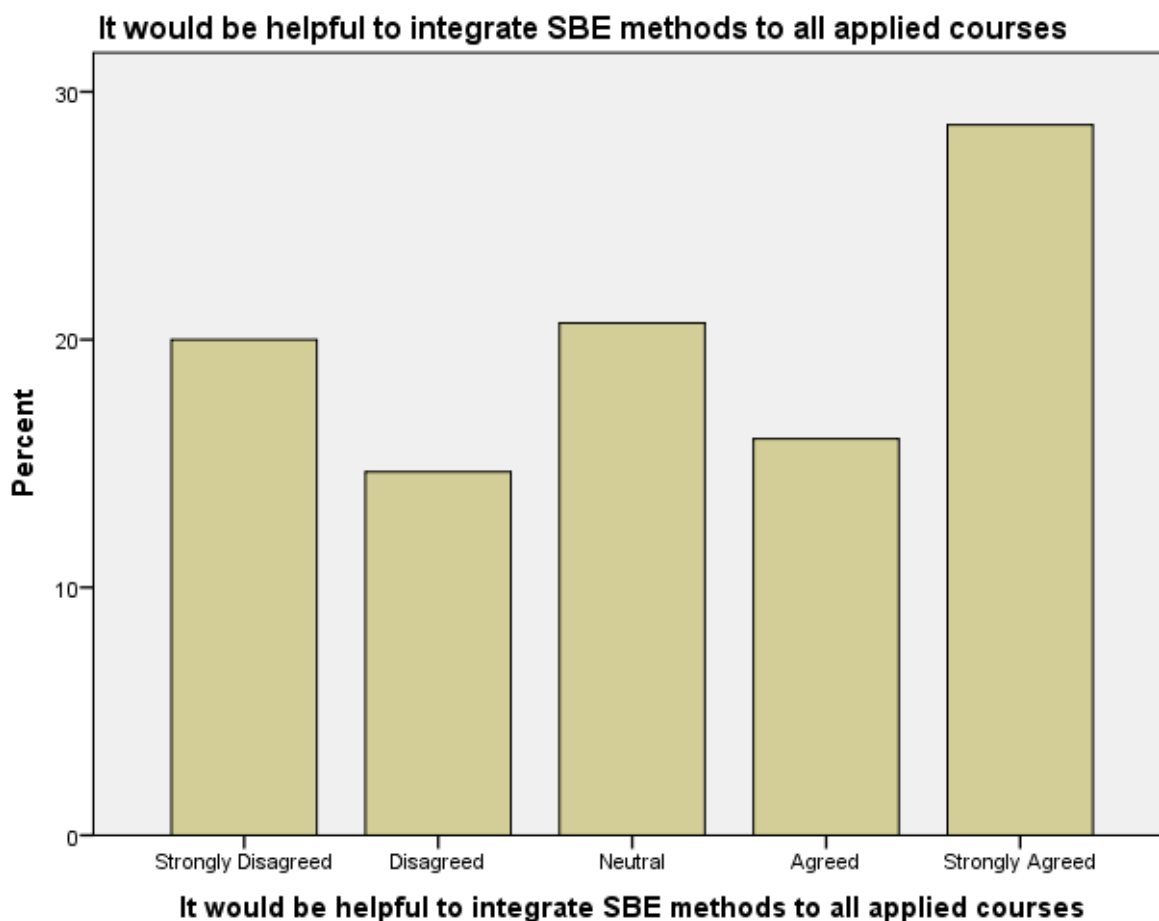


It would be helpful to integrate SBE methods to all applied courses

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	30	20.0	20.0	20.0
Disagreed	22	14.7	14.7	34.7
Neutral	31	20.7	20.7	55.3
Agreed	24	16.0	16.0	71.3
Strongly Agreed	43	28.7	28.7	100.0
Total	150	100.0	100.0	

It Would Be Helpful to Integrate SBE Methods to All Applied Courses: This table reveals 44.7% of 150 respondents agreed or strongly agreed that SBE

should be integrated into all applied courses, while 34.7% disagreed or strongly disagreed. The neutral group (20.7%) reaches a 100.0% cumulative total. Opinions are mixed but lean slightly positive.

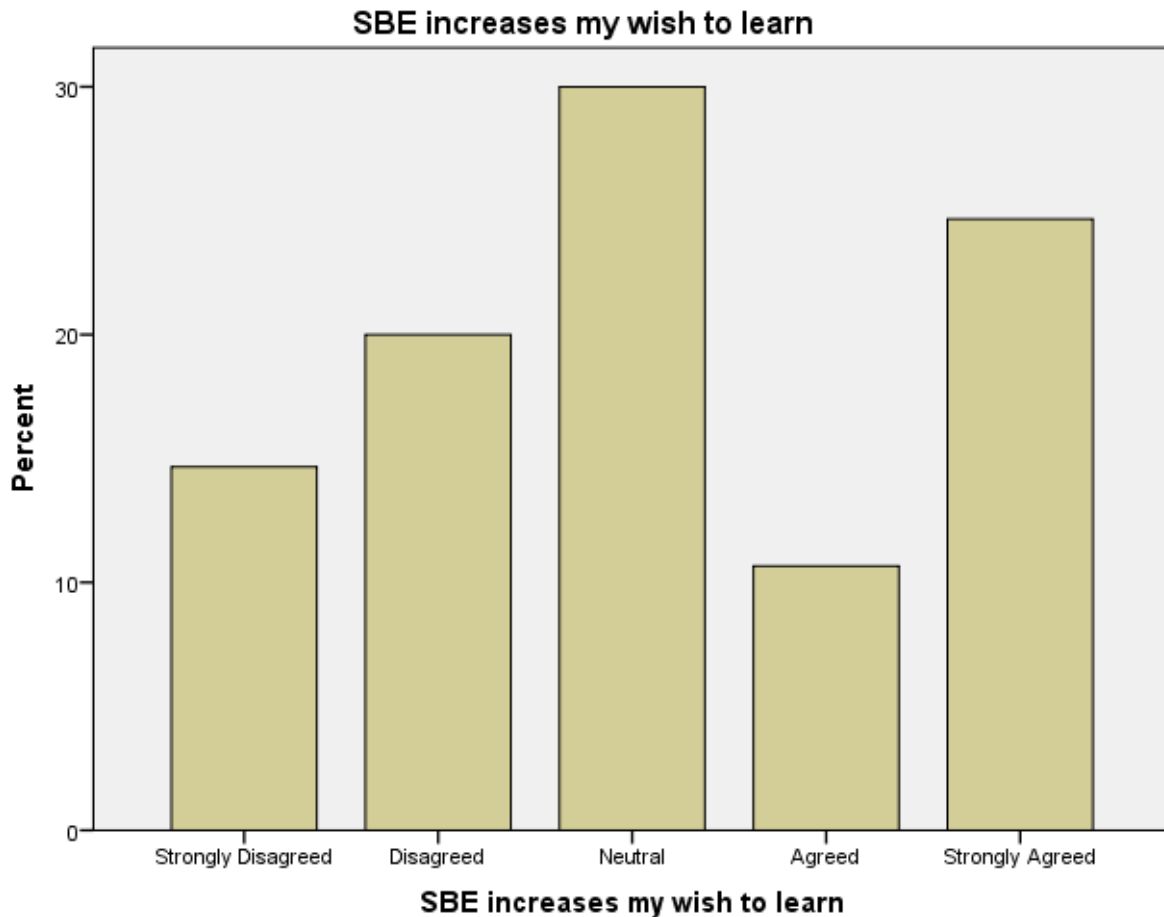


SBE increases my wish to learn

	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly Disagreed	22	14.7	14.7	14.7
Disagreed	30	20.0	20.0	34.7
Neutral	45	30.0	30.0	64.7
Agreed	16	10.7	10.7	75.3
Strongly Agreed	37	24.7	24.7	100.0
Total	150	100.0	100.0	

SBE Increases My Wish to Learn: Among 150 respondents, 34.7% agreed or strongly agreed that SBE boosts their desire to learn, while 34.7%

disagreed or strongly disagreed. The largest group, 30.0%, was neutral, totaling 100.0% cumulatively. Responses indicate ambivalence about SBE’s motivational impact.



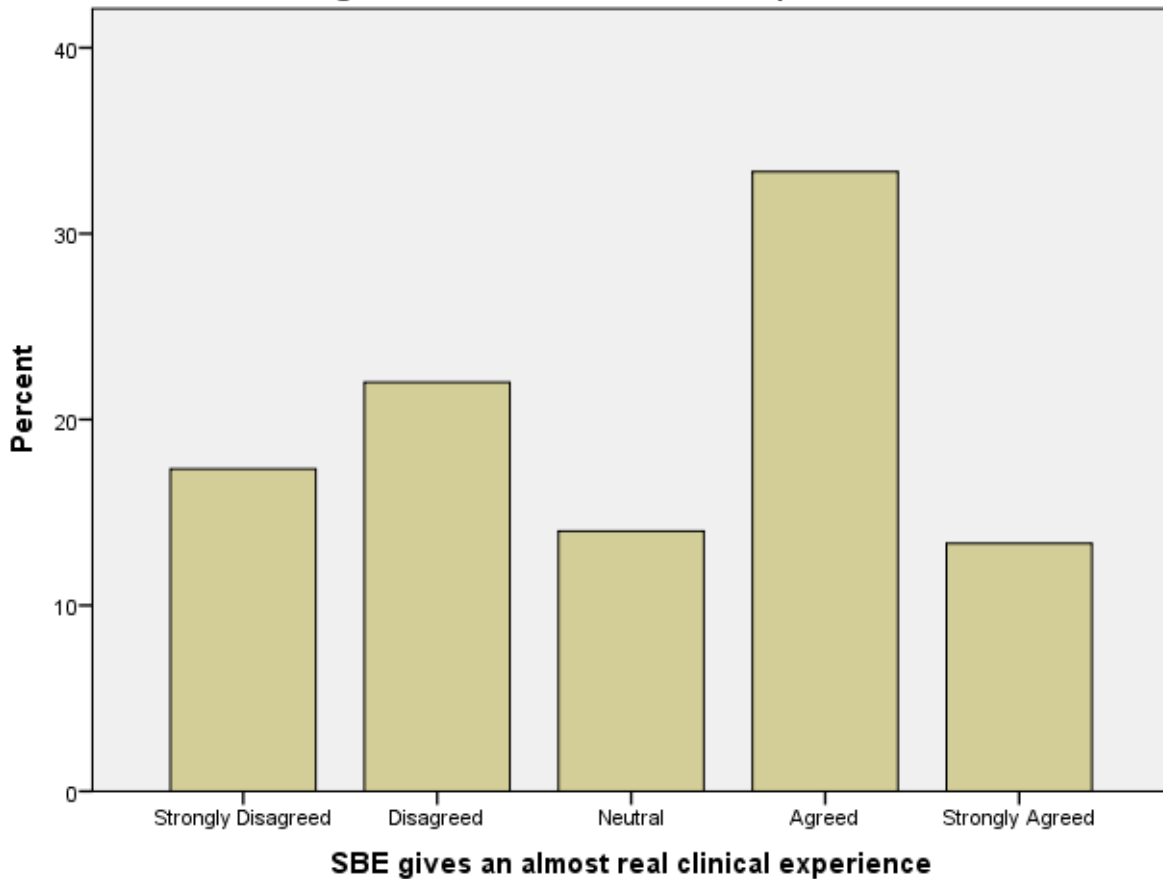
SBE gives an almost real clinical experience

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	26	17.3	17.3	17.3
Valid Disagreed	33	22.0	22.0	39.3
Valid Neutral	21	14.0	14.0	53.3
Valid Agreed	50	33.3	33.3	86.7
Valid Strongly Agreed	20	13.3	13.3	100.0
Valid Total	150	100.0	100.0	

SBE Gives an Almost Real Clinical Experience: This table shows 46.6% of 150 respondents agreed or strongly agreed that SBE provides a near-real clinical

experience, while 39.3% disagreed or strongly disagreed. The neutral group (14.0%) completes the 100.0% cumulative total. Opinions lean slightly positive but remain divided.

SBE gives an almost real clinical experience

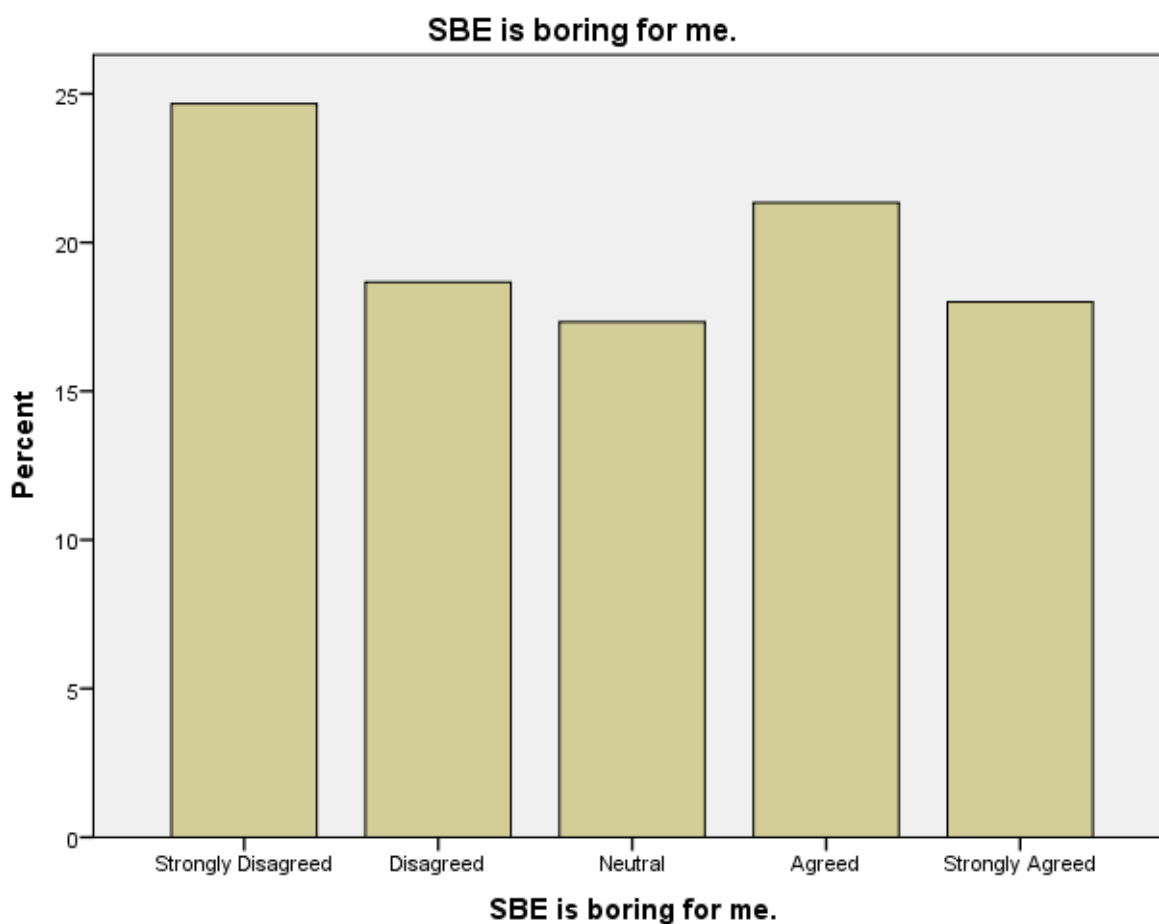


SBE is boring for me.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	37	24.7	24.7	24.7
Disagreed	28	18.7	18.7	43.3
Neutral	26	17.3	17.3	60.7
Agreed	32	21.3	21.3	82.0
Strongly Agreed	27	18.0	18.0	100.0
Total	150	100.0	100.0	

SBE Is Boring for Me: Of 150 respondents, 39.3% agreed or strongly agreed that SBE is boring, while 43.4% disagreed or strongly disagreed. The neutral

group (17.3%) brings the cumulative total to 100.0%. Responses suggest a slight edge against finding SBE boring.

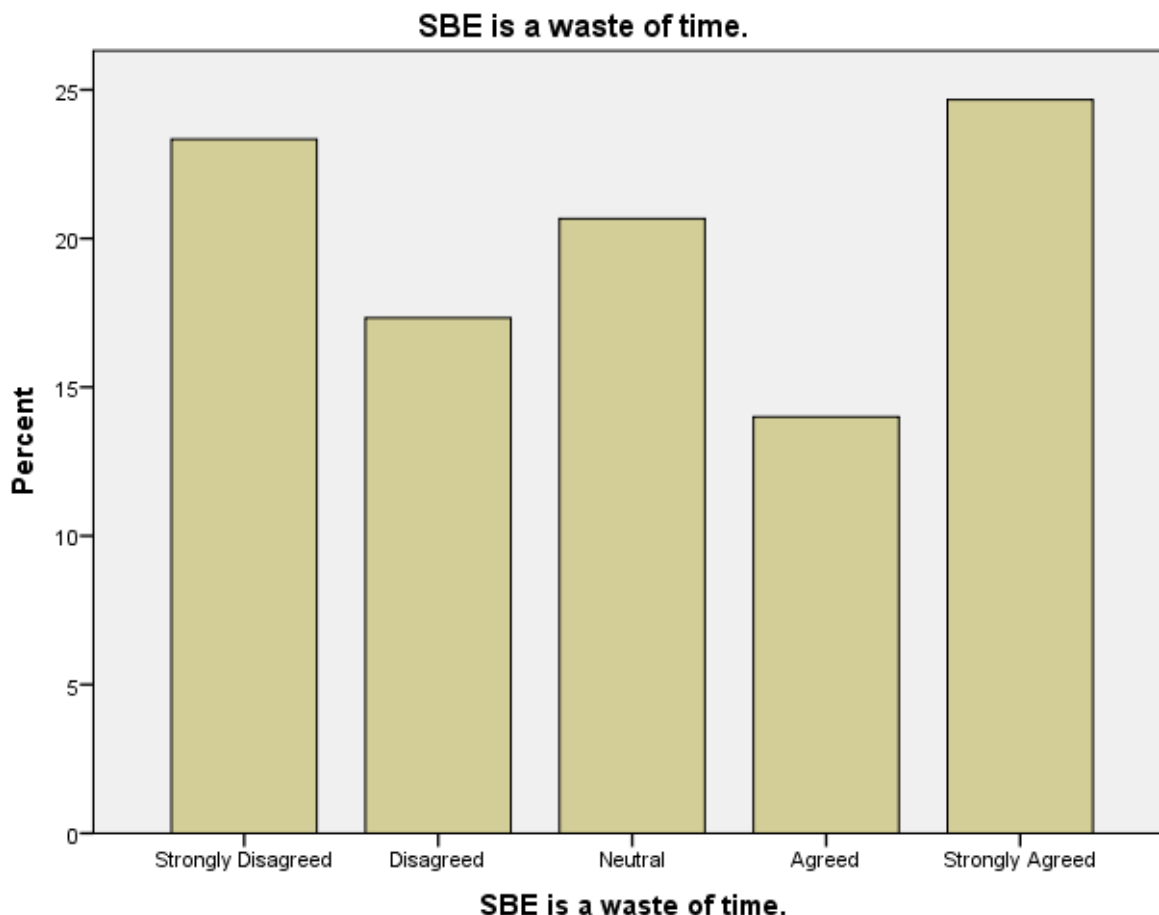


SBE is a waste of time.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	35	23.3	23.3	23.3
Disagreed	26	17.3	17.3	40.7
Neutral	31	20.7	20.7	61.3
Agreed	21	14.0	14.0	75.3
Strongly Agreed	37	24.7	24.7	100.0
Total	150	100.0	100.0	

SBE Is a Waste of Time: This table indicates 38.7% of 150 respondents agreed or strongly agreed that SBE is a waste of time, while 40.6% disagreed or strongly

disagreed. The neutral group (20.7%) completes the 100.0% cumulative total. Opinions are closely split, with slight opposition to this view.

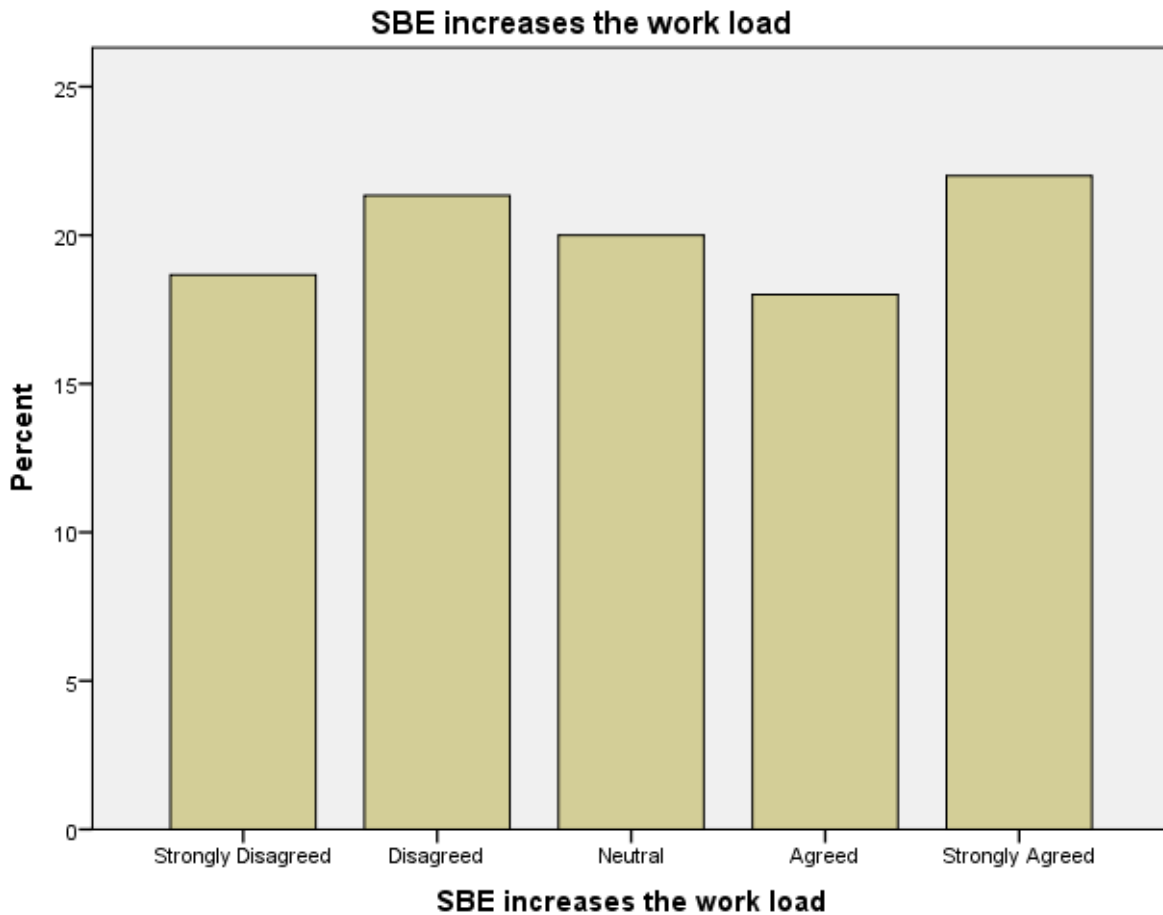


SBE increases the work load

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagreed	28	18.7	18.7	18.7
Disagreed	32	21.3	21.3	40.0
Neutral	30	20.0	20.0	60.0
Agreed	27	18.0	18.0	78.0
Strongly Agreed	33	22.0	22.0	100.0
Total	150	100.0	100.0	

SBE Increases the Workload: Among 150 respondents, 40.0% agreed or strongly agreed that SBE increases workload, while 40.0% disagreed or

strongly disagreed. The neutral group (20.0%) reaches a 100.0% cumulative total. Responses are evenly divided, reflecting no clear consensus.



Discussion

The research data from 150 nursing students provides a detailed examination of the effects of Simulation-Based Education (SBE) on various

aspects of their clinical education, including participation, self-confidence, decision-making, and educational value. The respondents, spanning

different academic years, offer diverse perspectives on SBE's efficacy and limitations. Below, each table is analyzed in the context of the research title, with conclusions and predictions drawn to strengthen the discussion and inform future nursing education strategies.

The distribution of respondents across academic years—20.0% first-year, 31.3% second-year, 16.7% third-year, and 32.0% final-year—reflects a balanced sample, capturing perspectives from students at various stages of clinical training. The predominance of second-year (31.3%) and final-year (32.0%) students suggests that responses may be influenced by differing levels of clinical exposure, with final-year students potentially offering more informed views due to their advanced training. This diversity strengthens the generalizability of findings regarding SBE's impact on clinical education.

The varied academic levels ensure a comprehensive view of SBE's effects across the nursing curriculum, with final-year students likely providing insights grounded in greater clinical experience. This distribution supports the study's aim to assess SBE's role in clinical education holistically. Future research could investigate how SBE perceptions evolve with academic progression, potentially showing that final-year students value SBE more for its practical relevance, informing targeted implementation strategies.

With 44.0% of respondents agreeing or strongly agreeing that SBE facilitates active participation in clinical practices, contrasted by 34.0% who disagreed or strongly disagreed, the data reveals mixed perceptions. The neutral group (22.0%) suggests uncertainty, possibly due to inconsistent simulation quality or limited hands-on opportunities. The significant disagreement (20.7% strongly disagreed) may reflect challenges in SBE's design, such as lack of realism or insufficient interactive elements, which are critical for active clinical learning in nursing.

SBE moderately supports active participation in clinical education, but its effectiveness is hampered for some students, likely due to variability in simulation delivery. This highlights a need for enhanced SBE design to align with clinical practice goals. Improving SBE's interactivity through advanced simulation technologies or scenario-based learning could increase positive responses, enhancing its role

in fostering active clinical engagement among nursing students.

Responses show polarization, with 38.7% agreeing or strongly agreeing that SBE boosts self-confidence, while 37.3% disagreed or strongly disagreed, and 24.0% remained neutral. This split suggests that SBE's ability to enhance confidence in clinical settings varies, possibly due to differences in simulation fidelity or feedback quality. For nursing students, self-confidence is crucial for effective clinical performance, and the high neutral response indicates potential for improvement in SBE's confidence-building capacity.

SBE's impact on self-confidence in clinical education is inconsistent, with nearly equal support and skepticism. This variability underscores the need for standardized, high-quality simulations to ensure confidence-building outcomes. Implementing structured debriefing and realistic scenarios could shift neutral and negative perceptions toward agreement, strengthening SBE's role in building nursing students' clinical confidence.

The data shows a near-even split, with 42.6% agreeing or strongly agreeing that SBE helps identify shortcomings, and 43.3% disagreeing or strongly disagreeing. The neutral group (14.0%) indicates some uncertainty. The high disagreement (26.7% strongly disagreed) suggests that many nursing students find SBE lacking in providing reflective feedback, a critical component for improving clinical skills.

SBE has potential as a reflective tool in clinical education, but its effectiveness is limited for many students, likely due to inadequate debriefing or superficial scenarios. This gap hinders its ability to support self-assessment in nursing training. Enhancing post-simulation feedback with personalized, detailed critiques could increase the proportion of students who value SBE for identifying shortcomings, improving its reflective utility.

With 40.7% agreeing or strongly agreeing and 40.7% disagreeing or strongly disagreeing, opinions on SBE's role in bridging theoretical and practical knowledge are evenly divided. The neutral group (20.7%) suggests uncertainty, possibly due to misaligned simulation content or limited integration with theoretical coursework. For nursing students, applying theory in practice is essential, and this split

highlights a challenge in SBE's curriculum integration.

SBE's effectiveness in linking theory to practice is contested, indicating a need for better alignment between simulation scenarios and nursing curricula. The balanced responses suggest variability in SBE's implementation across courses. Designing SBE scenarios that explicitly incorporate theoretical concepts could increase positive perceptions, enhancing its role in translating nursing theory into clinical practice.

Responses show 41.3% agreeing or strongly agreeing that SBE enhances healthcare quality, while 45.3% disagreed or strongly disagreed, with 13.3% neutral. The significant disagreement suggests skepticism about SBE's broader impact on clinical outcomes, possibly due to limited exposure to its long-term effects in real healthcare settings. For nursing education, improving healthcare quality is a key goal, and these findings indicate a gap in perceived impact. SBE's contribution to healthcare quality is viewed skeptically by many nursing students, reflecting concerns about its real-world applicability. Positive responses suggest some recognition of its potential, but improvements are needed. Longitudinal studies tracking SBE-trained nurses in clinical settings could demonstrate tangible quality improvements, potentially increasing positive perceptions in future surveys.

With 40.7% agreeing or strongly agreeing and 40.0% disagreeing or strongly disagreeing, the desire for SBE is evenly split, with 19.3% neutral. This division suggests that while some nursing students value SBE, others find it unappealing, possibly due to perceived workload or lack of engagement. The neutral responses indicate indecision, highlighting the need for more compelling SBE experiences.

The split in desire for SBE reflects mixed experiences, with engagement and workload concerns influencing preferences. This suggests that SBE's appeal in nursing education needs enhancement to gain broader acceptance. Incorporating engaging elements like gamification or realistic scenarios could increase the desire for SBE, reducing disagreement and fostering greater acceptance among nursing students.

With 44.0% agreeing or strongly agreeing and 35.3% disagreeing or strongly disagreeing, SBE is seen as moderately effective in enhancing critical decision-

making skills, with 20.7% neutral. Critical decision-making is vital for nursing practice, and the moderate support suggests that SBE scenarios may vary in complexity or relevance, impacting their effectiveness. SBE shows promise in developing critical decision-making skills, but its impact is inconsistent, likely due to variability in scenario design. The neutral responses indicate potential for improvement in this critical area of nursing education. Increasing the complexity and realism of decision-driven SBE scenarios could enhance positive perceptions, strengthening its role in developing nursing students' decision-making abilities.

This table shows a positive trend, with 51.4% agreeing or strongly agreeing that SBE enhances clinical success, including a strong 34.7% strongly agreeing. However, 28.0% disagreed or strongly disagreed, and 20.7% were neutral. This is the most positive response among the tables, suggesting that SBE is perceived as beneficial for clinical outcomes by a majority, though skepticism persists.

SBE is generally viewed as supportive of clinical success in nursing education, with the highest positive response indicating its potential value. However, dissent suggests that simulation quality needs consistency to maximize impact. Enhancing SBE's realism and feedback mechanisms could further increase positive perceptions, solidifying its role in improving clinical success among nursing students.

With 49.3% disagreeing or strongly disagreeing and 37.4% agreeing or strongly agreeing, SBE's ability to prepare nursing students for real clinical environments is questioned by many. The neutral group (13.3%) suggests uncertainty, possibly due to simulations lacking sufficient realism or relevance to actual clinical settings.

SBE's preparatory effectiveness for real-world clinical practice is limited, with significant skepticism among nursing students. This highlights a critical gap in simulation design that needs addressing to align with clinical education goals. Developing more realistic, context-specific SBE scenarios could reduce disagreement, enhancing its perceived preparatory value for nursing students entering clinical environments.

With 44.0% agreeing or strongly agreeing and 38.0% disagreeing or strongly disagreeing, opinions on SBE's role in reducing clinical mistakes are divided, with

18.0% neutral. Reducing errors is critical in nursing, and the moderate support suggests that SBE has potential but may not consistently simulate high-risk scenarios effectively.

SBE is seen as moderately effective in reducing clinical mistakes, but its impact is inconsistent, likely due to variations in scenario design or feedback. This indicates a need for targeted improvements in error-focused simulations. Incorporating high-fidelity, error-prone scenarios with robust feedback could increase positive responses, enhancing SBE's role in minimizing clinical errors among nursing students.

With 48.7% agreeing or strongly agreeing and 33.3% disagreeing or strongly disagreeing, SBE is relatively well-regarded for helping nursing students realize their shortcomings, with 18.0% neutral. This positive lean suggests that SBE can serve as a reflective tool, though improvements are needed to address dissenting views.

SBE is moderately effective in fostering self-awareness of shortcomings, a key aspect of nursing education, but its impact varies. Enhanced feedback mechanisms could strengthen its reflective value. Structured debriefing sessions focusing on self-assessment could increase the proportion of students who find SBE valuable for realizing shortcomings, enhancing its educational impact.

With 44.7% agreeing or strongly agreeing and 40.0% disagreeing or strongly disagreeing, opinions on the importance of learning techniques through SBE are balanced, with 15.3% neutral. This suggests that while some nursing students value SBE's educational versatility, others may not see its relevance to diverse learning approaches.

SBE's role in teaching varied learning techniques is recognized by many, but skepticism persists, possibly due to limited exposure to diverse simulation methods. This indicates a need for broader SBE applications in nursing curricula. Expanding SBE to include diverse learning strategies could increase positive perceptions, reinforcing its importance in nursing education.

With 44.7% agreeing or strongly agreeing and 34.7% disagreeing or strongly disagreeing, there is moderate support for integrating SBE across all applied nursing courses, with 20.7% neutral. This suggests a desire for broader SBE implementation, though concerns about

feasibility or workload may contribute to disagreement.

Many nursing students see value in integrating SBE across applied courses, but resistance suggests concerns about implementation challenges. This highlights the need for strategic integration planning. Pilot programs testing SBE integration in applied courses could demonstrate its benefits, potentially increasing support and reducing disagreement.

With 34.7% agreeing or strongly agreeing and 34.7% disagreeing or strongly disagreeing, opinions on SBE's motivational impact are evenly split, with 30.0% neutral. The high neutral response suggests that SBE's ability to inspire learning in nursing students is inconsistent, possibly due to unengaging simulation designs.

SBE's motivational impact on nursing students is limited, with equal support and skepticism indicating a need for more engaging simulation experiences to boost learning enthusiasm. Incorporating engaging elements like gamification or interactive scenarios could enhance SBE's motivational appeal, reducing neutral and negative responses.

With 46.6% agreeing or strongly agreeing and 39.3% disagreeing or strongly disagreeing, SBE is moderately viewed as providing a near-real clinical experience, with 14.0% neutral. The positive lean suggests potential, but significant disagreement indicates gaps in simulation realism critical for nursing training.

SBE is seen as somewhat effective in mimicking real clinical experiences, but its realism needs improvement to meet nursing students' expectations for practical training. Advancing simulation technology to enhance realism could increase positive perceptions, strengthening SBE's role in clinical preparation.

With 39.3% agreeing or strongly agreeing that SBE is boring and 43.4% disagreeing or strongly disagreeing, opinions are closely divided, with 17.3% neutral. The slight edge against finding SBE boring suggests that engagement varies, likely influenced by simulation design or delivery.

SBE's engagement level is a concern for many nursing students, with nearly equal perceptions of boredom and engagement indicating a need for more dynamic simulation approaches. Introducing interactive and varied SBE formats could reduce perceptions of boredom, enhancing its appeal in nursing education.

With 38.7% agreeing or strongly agreeing that SBE is a waste of time and 40.6% disagreeing or strongly disagreeing, perceptions are nearly balanced, with 20.7% neutral. The slight opposition to this view suggests that most nursing students see some value in SBE, though significant skepticism persists.

While many nursing students do not view SBE as a waste of time, a substantial minority does, indicating challenges in demonstrating its value in clinical education. Highlighting SBE's tangible benefits through evidence-based outcomes could reduce perceptions of it being a waste of time, increasing its acceptance.

With 40.0% agreeing or strongly agreeing and 40.0% disagreeing or strongly disagreeing, opinions on SBE's impact on workload are evenly split, with 20.0% neutral. This balance suggests that workload concerns are a significant factor in SBE's reception among nursing students.

SBE's perceived workload increase is a divisive issue, with equal support and opposition indicating a need to balance its educational benefits with time demands in nursing curricula. Streamlining SBE implementation to minimize additional workload could reduce negative perceptions, enhancing its integration into nursing education.

Conclusion: The data reveals that SBE has a mixed reception among nursing students, with moderate support for its benefits in clinical success (51.4%), realizing shortcomings (48.7%), and providing near-real clinical experiences (46.6%), but significant skepticism regarding its preparatory value (49.3% disagreement) and impact on healthcare quality (45.3% disagreement). These findings suggest that while SBE holds promise for enhancing clinical education, its effectiveness is hindered by inconsistencies in design, realism, and feedback. The balanced academic distribution underscores the need for tailored SBE approaches that address the evolving needs of students across years.

The polarized responses highlight critical areas for improvement, such as enhancing simulation realism, standardizing feedback, and aligning scenarios with theoretical coursework. Negative perceptions, such as SBE being boring (39.3%) or a waste of time (38.7%), underscore the importance of engagement and perceived value. Workload concerns (40.0%

agreement) further suggest that SBE's integration must be carefully managed to avoid overwhelming students.

SBE offers significant potential to enhance the clinical education of nursing students, particularly in fostering clinical success and self-awareness, but its impact is limited by variability in implementation and perceived relevance. Addressing these challenges through improved design and integration could maximize SBE's benefits. Future advancements in SBE, such as high-fidelity simulations, structured debriefing, and curriculum alignment, could significantly increase positive perceptions, making SBE a cornerstone of nursing education. Longitudinal studies and pilot integrations could provide evidence to support broader adoption, ultimately improving clinical preparedness and healthcare quality.

These findings call for nursing educators to refine SBE protocols, ensuring they are engaging, realistic, and aligned with clinical and theoretical objectives to fully realize their potential in nursing education.

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