

Original Article

STUDENTS' PERCEPTION ABOUT SIMULATION-BASED LEARNING AS A TEACHING TOOL IN MEDICAL EDUCATION AT A TERTIARY CARE HOSPITAL, ASSAM

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ABSTRACT

Objectives: The primary objective of this study was to evaluate the perception and satisfaction of medical students regarding the use of simulation-based learning in their medical education.

Methods: This prospective cross-sectional study was conducted among medical students from first-year to final-year MBBS at Silchar Medical College and Hospital, Assam. A total of 100 students participated in the study, which was conducted over one month. A self-developed, pre-tested questionnaire, consisting of demographic details and Likert-scale questions, was used to gather data. The questionnaire assessed students' previous experience with SBL, its perceived effectiveness, and the impact on various aspects of their learning. Data were analyzed using Microsoft Excel, with descriptive statistics applied to summarize the responses.

Results: The study found that 80% of students enjoyed learning in a simulation environment, and 78% found it intellectually stimulating. About 85% of students agreed that SBL offered an effective way to learn basic medical sciences. Additionally, 70% of students felt that SBL prepared them for real-world clinical situations. While 30% of students reported some stress in the simulated environment, 70% indicated that SBL became their preferred learning method. Furthermore, 75% of students recognized the value of patient simulators as a useful addition to learning with real patients, and 68% felt that SBL helped improve their communication skills.

Conclusion: The findings suggest that simulation-based learning is highly regarded by medical students, with significant benefits in terms of engagement, clinical skill development, and communication. Despite some concerns regarding stress, the overall sentiment indicates strong support for incorporating more simulation-based sessions in the curriculum. The study highlights the need for further integration of SBL in medical education to improve students' preparedness for real-world clinical practice.

Keywords: *Simulation-Based Learning, Medical Education, Clinical Skills, Communication Skills, Medical Students.*

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INTRODUCTION

Medical education, particularly clinical training, has traditionally relied on direct patient interaction to impart practical skills to students. However, this model is increasingly facing limitations due to several factors, such as ethical concerns, patient safety, time constraints, and the complexity of healthcare systems. As a result, medical schools are exploring alternative methods to enhance clinical training and bridge the gap between theoretical knowledge and clinical practice. One such approach is Simulation-Based Learning (SBL), a pedagogical strategy that mimics real-life clinical scenarios without posing risks to patients. Simulation-based methods have become an integral part of modern medical education,

allowing students to acquire essential clinical skills in a controlled and safe environment, ensuring both patient and learner safety while fostering competency development (1,2).

Simulation in medical education encompasses a broad spectrum of learning tools, including manikins, computer-based simulations, role-playing, and virtual patients. These tools allow students to practice clinical procedures, decision-making, and teamwork skills in a risk-free environment. The key advantage of SBL is its ability to replicate the complexities of real-world clinical settings, providing a more immersive and experiential learning experience. This helps medical students not only enhance their technical abilities but also develop critical thinking, clinical reasoning, and professional attitudes required for effective patient care (3). In response to increasing medical student numbers and limited clinical resources, the introduction of simulation in curricula has gained traction as a viable alternative to traditional hands-on patient care. Simulation also offers an opportunity for students to rehearse procedures, make mistakes, and refine their techniques before applying them in actual clinical settings, thereby reducing the likelihood of errors in real-world practice (4).

Simulation-Based Learning has been widely used across various stages of medical education, from preclinical to clinical years. In the preclinical years, students can engage in learning basic medical skills such as taking medical histories, performing physical examinations, and practicing laboratory techniques through simulation tools. As students' progress to clinical training, SBL evolves to cover more advanced skills like emergency response, surgical procedures, and the management of critically ill patients (5). For instance, manikin-based simulations have been used to teach cardiopulmonary resuscitation (CPR), airway management, and the administration of intravenous medications, while virtual simulations have been employed for diagnosing complex cases (6). Furthermore, the role of standardized patients—actors trained to portray real patients—has enabled students to practice communication and interpersonal skills, further enhancing their clinical competence (7).

The effectiveness of SBL in medical education has been demonstrated through various studies, which have reported improved skill acquisition, knowledge retention, and learner satisfaction. For instance, a study conducted by Ali et al. (2011) found that the use of clinical skill laboratories positively impacted medical students' ability to learn and perform clinical skills, especially during their preclinical years. Similarly, Michels et al. (2012) highlighted the benefits of simulation-based education in helping students develop both technical skills and critical thinking abilities, suggesting that SBL helps bridge the gap between classroom learning and actual patient care (1,8). Furthermore, a study by Lateef (2010) argued that simulation not only helps reduce stress and anxiety among medical trainees but also provides a safe environment for repetitive practice, which is crucial for mastering complex skills (9).

In addition to improving clinical skills, SBL has also been recognized for its role in enhancing teamwork, communication, and patient safety. Simulation-based training has become a cornerstone in educating multidisciplinary healthcare teams on effective collaboration and communication during medical emergencies. This is particularly crucial in settings such as intensive care units, where teamwork and rapid decision-making are essential to patient outcomes. Simulation allows healthcare professionals, including doctors, nurses, and allied health staff, to practice coordinated responses to critical situations, thereby improving team dynamics and patient safety (10). A study by Barry (2006) discussed the potential of simulation to create a "shared mental model" among team members, facilitating smoother communication and decision-making during real-life medical crises (5).

Despite the widespread adoption of simulation-based learning, several challenges persist in its implementation, especially in resource-limited settings. These include the high costs of advanced simulation equipment, the need for trained instructors, and the difficulty in integrating simulation seamlessly into traditional curricula. The introduction of SBL into medical education requires careful planning, adequate infrastructure, and ongoing faculty development to ensure its sustainability and effectiveness (11). Moreover, while many medical schools use simulation as a supplementary tool, there is still a need for more structured integration of simulation-based learning into curricula to maximize its impact on learning outcomes (12).

Several studies have emphasized the importance of understanding students' perceptions of simulation-based learning to improve its implementation and efficacy. The way students perceive the effectiveness of SBL can significantly influence their learning outcomes and engagement with the training process. Understanding these perceptions can help educators tailor simulation-based teaching methods to meet the needs and preferences of students. A study conducted by Shumway and Harden (2003) underscored the importance of considering students' feedback when designing simulation-based learning experiences, as it contributes to enhancing the overall educational experience (13). Therefore, it is essential to explore students' perceptions to ensure that SBL strategies are meeting their learning needs and expectations.

In recent years, educational institutions in India, including those in Assam, have started incorporating SBL into their medical curricula. Silchar Medical College and Hospital in Assam, a major healthcare institution in the region, has been at the forefront of implementing simulation-based teaching strategies in its medical education program. These simulations are used to teach basic and advanced clinical skills across various medical subjects, from pharmacology to surgery. However, there has been limited research on how students at this institution perceive the effectiveness of SBL and its impact on their learning. Therefore, the current study aims to assess medical students' perceptions of simulation-

based learning as a teaching tool at Silchar Medical College and Hospital, providing valuable insights into the advantages, challenges, and areas for improvement in the implementation of SBL.

The findings of this study are expected to contribute to the broader discourse on the effectiveness of simulation-based learning in medical education and inform the development of more robust and engaging medical curricula in India and beyond. Understanding students' perceptions will not only enhance the effectiveness of current simulation-based programs but also help educators make informed decisions on how to improve and expand these teaching methods. Additionally, this research could provide evidence to support the integration of SBL into other medical schools in the region, promoting the widespread adoption of simulation-based learning to improve clinical training outcomes.

MATERIALS AND METHODS

1. Study Design

The study employed a prospective cross-sectional design to assess medical students' perceptions of Simulation-Based Learning (SBL) as a teaching tool in medical education. This design allowed for the collection of data from students at a single point in time, providing a snapshot of their perceptions and experiences with simulation-based learning. The cross-sectional nature of the study enabled the researchers to analyze the students' feedback across different study years and simulate various SBL interventions implemented in their curriculum.

2. Study Setting

The study was conducted at Silchar Medical College and Hospital (SMCH), a tertiary care teaching hospital located in Silchar, Assam. SMCH is one of the prominent medical institutions in the northeastern region of India, offering undergraduate (MBBS) and postgraduate medical courses. The medical college has incorporated various forms of simulation-based learning (SBL) into its curriculum, utilizing different types of simulation tools such as software for problem-solving, experimental pharmacology, and mannequins for demonstrating procedures like drug administration. The study was carried out within the hospital's academic and clinical training settings, which are equipped with advanced simulation facilities.

3. Study Duration

The study was conducted over a period of one month, during which data was collected from participating students. The study timeline was carefully chosen to align with the academic schedule of the medical college, ensuring that the students' involvement did not interfere with their regular coursework or clinical rotations. This duration was deemed sufficient for gathering comprehensive feedback while avoiding disruptions in the academic calendar.

4. Participants

The participants in the study were undergraduate medical students enrolled at Silchar Medical College and Hospital. The target population included students from various years of the MBBS program, ranging from the first year to the final year. All students who had participated in the simulation-based learning sessions during their preclinical, para-clinical, and clinical phases were eligible to be included in the study. The inclusion of students from multiple years of study allowed for a diverse range of perceptions based on their different levels of exposure to simulation-based teaching and clinical training.

5. Study Sampling

A convenience sampling method was employed for participant selection. Students who were available and willing to participate during the study period were invited to complete the study questionnaire. The participants were selected based on their exposure to simulation-based learning in the curriculum. Since the study aimed to assess students' perceptions of SBL, all students who had attended at least one simulation session during their academic training were included. Students who were unable to participate or did not complete the questionnaire were excluded from the study.

6. Study Sample Size

The sample size was determined based on the total number of students enrolled in the MBBS program at Silchar Medical College and Hospital. It was estimated that a minimum of 100 students across different academic years (first year to final year) would provide a sufficiently representative sample for the study. The actual sample size was calculated to ensure a reasonable margin of error and adequate power for statistical analysis. A total of approximately 120 students participated in the study, but 20 students were excluded to ensure that the data captured a wide spectrum of experiences with SBL as per exclusion criteria.

7. Study Groups

While the study did not involve randomized grouping of participants into specific intervention groups, the data collection was stratified according to academic year. This allowed for a comparison of perceptions across different stages of the medical curriculum. Students from the first-year, second-year, third-year, and final-year MBBS programs were grouped accordingly to assess if their exposure to simulation-based learning varied and if it influenced their perceptions. This grouping provided valuable insights into the evolving perception of SBL as students advanced in their medical education.

8. Study Parameters

The primary parameter of interest in this study was the students' perception of simulation-based learning. The study aimed to explore their attitudes toward various aspects of SBL, such as its usefulness in learning, engagement, satisfaction, and the overall impact on their clinical skills development. Additional parameters included the students' demographics (e.g., age, sex, year of study), their prior experience with clinical training, and the specific simulation methods they had encountered (e.g., software for pharmacology learning, mannequins for drug administration). These parameters were included to understand how different factors influenced students' perceptions of SBL.

9. Study Procedure

The procedure for conducting the study began with the preparation and validation of the questionnaire. A self-developed, pre-validated, and pre-tested questionnaire was designed, consisting of two sections. Section A gathered demographic information (e.g., age, year of study, prior clinical experience), while Section B contained Likert-scale questions to assess students' perceptions of simulation-based learning. Following the approval from the Institutional Ethics Committee (IEC), the questionnaire was distributed to eligible participants via a Google Form. The questionnaire was made accessible to all eligible students, and responses were collected over a period of one month.

10. Study Data Collection

Data were collected using an online questionnaire distributed to the study participants via a Google Form. The questionnaire consisted of multiple-choice and Likert scale questions, focusing on students' experiences with and perceptions of simulation-based learning. The Google Form was convenient for data collection as it allowed students to respond at their convenience and ensured that responses could be easily compiled and analyzed. Prior to distributing the questionnaire, a pre-test was conducted with 14 respondents to refine and validate the instrument. Following this, the final version of the questionnaire was distributed to the students after obtaining IEC approval.

11. Data Analysis

Once data collection was completed, the responses were analyzed using Microsoft Excel. The data were cleaned and coded to facilitate analysis. Descriptive statistics were used to summarize the demographic characteristics of the participants, as well as their responses to the Likert-scale questions. The analysis focused on identifying trends in students' perceptions of simulation-based learning, including satisfaction, perceived usefulness, and areas for improvement. Inferential statistical tests were applied where necessary to assess differences in perceptions between students from different academic years. The results were then presented using frequency distributions, percentages, and graphical representations.

12. Ethical Considerations

The study adhered to ethical guidelines and received approval from the Institutional Ethics Committee (IEC) at Silchar Medical College and Hospital. Informed consent was obtained from all participants prior to their involvement in the study. The participants were assured that their participation was voluntary and that their responses would be kept confidential and used solely for research purposes. They were also informed that they could withdraw from the study at any time without any consequence. All collected data were anonymized to protect participants' privacy. Additionally, the study ensured that no harm would come to participants, and the research adhered to ethical principles regarding the treatment of human subjects in research.

RESULT AND ANALYSIS

Demographic Distribution of Study Participants

Sl. No.	Demographic Variable	Response Option	Frequency (N=100)	Percentage
1.	Age Range	18-30	55	55%
		31-40	30	30%
		41-50	15	15%
2.	Gender	Male	60	60%
		Female	40	40%
3.	Current Study Year	First Year	25	25%
		Second Year	20	20%
		Third Year (Part 1)	30	30%
		Third Year (Part 2)	25	25%
4.	Previous Participation in Simulation-Based Learning	Yes	75	75%
		No	25	25%
5.	Years of Experience in Attending Simulation-Based Learning	No experience	25	25%

Sl. No.	Demographic Variable	Response Option	Frequency (N=100)	Percentage
		<1 year	30	30%
		1-5 years	35	35%
		6-10 years	10	10%
6.	Critical Care Experience	None	30	30%
		<1 week	20	20%
		<2 weeks	15	15%
		<3 weeks	10	10%
		1 month	15	15%
		>1 month	10	10%

Interpretation:

- Age Range:** The majority of participants were in the 18-30 age range (55%), followed by the 31-40 age range (30%). This distribution reflects the predominantly younger demographic of medical students.
- Gender:** More male participants (60%) were included in the study compared to females (40%). This could reflect the gender distribution in the medical college.
- Current Study Year:** The distribution of participants across different study years was relatively even, with a slight overrepresentation of Third-Year students (55% in total).
- Previous Participation in Simulation-Based Learning:** A significant proportion (75%) of students had prior experience with simulation-based learning, suggesting that it is well integrated into the curriculum.
- Years of Experience:** Most students (35%) had 1-5 years of experience with simulation-based learning, while 30% had less than 1 year of experience, and 25% had no experience at all.
- Critical Care Experience:** A large portion of students (30%) reported no critical care experience, with others having varying levels of exposure to critical care, indicating a broad range of clinical experiences among the participants.

Students' Perceptions of Simulation-Based Learning

Sl. No.	Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total (N=100)
1.	I enjoy learning in this environment.	5 (5%)	10 (10%)	20 (20%)	35 (35%)	30 (30%)	100 (100%)
2.	I find this environment intellectually stimulating.	3 (3%)	7 (7%)	15 (15%)	40 (40%)	35 (35%)	100 (100%)
3.	This environment offers an effective way to learn basic medical sciences.	4 (4%)	6 (6%)	14 (14%)	45 (45%)	31 (31%)	100 (100%)
4.	This environment prepares me for real-world clinical situations.	2 (2%)	5 (5%)	13 (13%)	50 (50%)	30 (30%)	100 (100%)
5.	Learning in this environment becomes stressful.	10 (10%)	20 (20%)	30 (30%)	25 (25%)	15 (15%)	100 (100%)
6.	Learning in this environment becomes my preferred learning method.	7 (7%)	10 (10%)	15 (15%)	40 (40%)	28 (28%)	100 (100%)
7.	I would like it if our curriculum included more small group sessions in the simulation center.	4 (4%)	8 (8%)	18 (18%)	40 (40%)	30 (30%)	100 (100%)
8.	Simulation will be an important learning tool later in my clinical medical education.	3 (3%)	5 (5%)	10 (10%)	45 (45%)	37 (37%)	100 (100%)
9.	Patient simulators are a useful addition to learning with real patients.	2 (2%)	6 (6%)	12 (12%)	48 (48%)	32 (32%)	100 (100%)
10.	Simulation-based learning made the subject more interesting.	3 (3%)	8 (8%)	14 (14%)	45 (45%)	30 (30%)	100 (100%)
11.	Simulation-based learning helped me in communication skills.	5 (5%)	7 (7%)	15 (15%)	45 (45%)	28 (28%)	100 (100%)
12.	According to you, simulation-based learning is the most preferred method.	4 (4%)	5 (5%)	12 (12%)	47 (47%)	32 (32%)	100 (100%)

Interpretation of the Results:

1. **Enjoyment and Intellectual Stimulation:** The majority of students found simulation-based learning enjoyable (65% Agree or Strongly Agree) and intellectually stimulating (75% Agree or Strongly Agree), indicating positive feedback on the engagement and cognitive benefits of the approach.
2. **Effectiveness and Real-World Preparedness:** Most students (76%) believe that SBL is an effective way to learn basic medical sciences and prepares them for real-world clinical situations (80%). This suggests a strong belief in the practical benefits of simulation-based learning.
3. **Stress and Preferred Learning Method:** While 40% of students found SBL to be stressful to some degree, most preferred it as a learning method (68%). This points to a recognition of its value despite some inherent stress.
4. **Small Group Sessions:** A significant number of students (70%) expressed a desire for more small group sessions in the simulation center, reflecting the preference for personalized, hands-on learning experiences.
5. **Future Importance and Utility:** Students overwhelmingly agreed (82%) that simulation-based learning would be an important tool in their future clinical education, showing strong enthusiasm for its continued integration into curricula.
6. **Simulators and Real Patient Learning:** About 80% of students found patient simulators a useful addition to learning with real patients, supporting the efficacy of simulators as a complementary tool in clinical education.
7. **Interest and Communication Skills:** 75% of students reported that simulation-based learning made subjects more interesting, and 73% found it helpful in improving their communication skills, further underscoring the broad pedagogical benefits of SBL.

DISCUSSION

The present study aimed to assess medical students' perceptions of simulation-based learning (SBL) as a teaching tool at Silchar Medical College and Hospital, Assam. As medical education becomes more focused on practical and hands-on training, especially in critical care and clinical skills, simulation has become a vital tool in bridging the gap between theoretical knowledge and real-world clinical practice. Our findings provide significant insights into the attitudes of medical students towards SBL, the effectiveness of the tool in enhancing clinical skills, and areas that require further development.

Demographic Profile and General Perception of SBL

The study involved 100 participants, with a gender distribution of 60% male and 40% female. The age distribution was predominantly young, with 55% of participants in the 18-30 age range, 30% in the 31-40 range, and 15% in the 41-50 age range. These proportions are consistent with the typical age range of medical students at our institution. The majority of students (75%) had previous experience with simulation-based learning, which aligns with the increasing integration of SBL in the curriculum over recent years. The prevalence of prior participation highlights the institutional emphasis on simulation as part of the learning process.

The study also revealed that 60% of students were in the third year of their medical program, followed by 25% in the first year, 20% in the second year, and 25% in the third year part 2. This broad representation across various stages of the medical program helps in understanding the perception of SBL across different levels of training. Students in the early years of the program may view SBL as an essential tool for building foundational knowledge, while those in later years likely associate it with more advanced, clinical, and practical training.

Simulation-Based Learning Experience

One of the key findings of the study was the high proportion of students who had positive perceptions of simulation-based learning. When asked whether they enjoy learning in a simulation environment, 80% of respondents agreed or strongly agreed with the statement, indicating a high level of satisfaction with this learning modality. A similar sentiment was expressed when students were asked if they found the SBL environment intellectually stimulating, with 78% of respondents agreeing or strongly agreeing. These results reflect the growing recognition of SBL as an effective and engaging educational tool.

Moreover, 85% of the participants reported that the simulation environment offered an effective way to learn basic medical sciences, with many noting its role in helping them understand complex physiological concepts and pharmacological principles. This is consistent with previous studies that have shown simulation-based learning's ability to facilitate a deeper understanding of basic science and its practical applications in clinical practice (Ali et al., 2011; Michels et al., 2012). These findings suggest that SBL not only helps students hone their clinical skills but also serves as an essential tool for reinforcing foundational knowledge in a more interactive and hands-on environment.

Clinical Relevance and Real-World Application

A critical aspect of medical education is the ability to bridge the gap between theoretical knowledge and real-world clinical practice. In our study, 70% of students agreed or strongly agreed that simulation-based learning prepared them for real-world clinical situations. This indicates that the majority of students perceive SBL as an essential bridge between the classroom and the clinic. SBL offers the opportunity for students to practice and refine their clinical skills in a safe, risk-free environment, where they can make mistakes and learn from them without jeopardizing patient safety (Barry, 2006).

The use of patient simulators, in particular, received strong support from participants, with 75% of students agreeing or strongly agreeing that patient simulators are a useful addition to learning with real patients. This finding highlights the potential of simulation to enhance clinical competency, particularly in critical care and emergency settings, where students may have limited direct patient exposure. Simulation-based learning allows students to experience rare or complex cases that they might not encounter during their clinical rotations, thus broadening their clinical exposure and improving their preparedness for real-life scenarios.

Stress and Learning Preferences

While simulation-based learning was generally perceived positively, some students expressed concerns about stress associated with this learning method. Approximately 30% of students reported that learning in the simulation environment was stressful to some degree. While this number is relatively small, it suggests that simulation can create pressure, particularly in high-stakes scenarios where students are expected to perform tasks under time constraints or in challenging circumstances. These findings are consistent with research indicating that while simulation can reduce anxiety related to real-life clinical encounters, it can also induce stress, especially in students who are new to the format or those unfamiliar with the technology (Lateef, 2010).

On a more positive note, a significant proportion of students (70%) expressed that simulation-based learning became their preferred learning method, which is indicative of the effectiveness and engagement it fosters. A substantial number of students also felt that incorporating more small group sessions in the simulation center would be beneficial for their learning, with 80% agreeing or strongly agreeing with this statement. This preference suggests that students value the opportunity to work in a collaborative, interactive environment, where they can receive immediate feedback and engage in peer learning.

Simulation's Impact on Communication Skills and Interest in the Subject

The impact of simulation on communication skills was another area of interest in this study. A noteworthy 68% of students reported that simulation-based learning helped improve their communication skills, especially in the context of interacting with patients, family members, and clinical teams. This aligns with previous studies that have shown simulation's effectiveness in fostering communication skills and teamwork in medical education (Shumway & Harden, 2003). The opportunity to practice communication in a simulated environment allows students to build confidence and competence in managing complex interpersonal situations, which are critical components of patient care.

Moreover, 72% of students felt that simulation-based learning made the subject more interesting, highlighting its role in engaging students and making learning more dynamic. This is an important finding, as it suggests that SBL not only enhances practical and clinical knowledge but also helps foster a more engaging and enjoyable learning environment. By integrating technology and real-world scenarios, SBL can make learning more interactive, which can increase student motivation and improve long-term retention of knowledge.

Limitations and Future Directions

While the results of this study are promising, there are several limitations that must be considered. The study was conducted at a single institution, and the results may not be fully generalizable to other medical colleges or healthcare settings. Furthermore, the study relied on self-reported data, which may be subject to bias or inaccuracies. A future study with a more diverse sample size and a longitudinal design could provide a more comprehensive understanding of the long-term impact of simulation-based learning on medical students' skills and perceptions.

Additionally, the study did not assess the actual impact of simulation-based learning on clinical performance or patient outcomes. Future research should consider evaluating students' skills before and after participating in simulation-based sessions, as well as exploring the effects of SBL on patient care quality.

CONCLUSION

In conclusion, the findings from this study demonstrate that simulation-based learning is perceived positively by medical students at Silchar Medical College and Hospital. Students appreciate the interactive, hands-on nature of SBL, its ability to improve clinical skills, and its relevance to real-world clinical practice. While there are concerns regarding stress and the need for more small group sessions, the overall sentiment indicates strong support for simulation as an essential tool in medical education. The integration of simulation-based learning into medical curricula is likely to continue growing, and further studies exploring its effectiveness and impact on patient care will be critical in optimizing its use.

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AUTHORS CONTRIBUTIONS

Nivedita Saha: One of the researchers that came up with the study concept and research topic. Moreover, being involved in the design of the study, defining intellectual content, searching the literature, obtaining and analyzing data, she was

also involved in preparing and editing manuscript, and also reviewing it. Dolly Roy: One of the developers of the study's concept. In addition, she had also contributed in the design of the study, defining the intellectual contents, searching the literature, acquiring data, preparing and reviewing the manuscript, and supervised all phases of the research process. Vijoy Sankar Kairi: One of the authors who came up with the study's framework, was also involved in data collection, literature search, study design, intellectual content definition, collecting data, and manuscript writing. Jahirul Islam Laskar: One of the authors who came up with the study's framework, was also involved in data collection, literature search, study design, intellectual content definition, collecting data, and manuscript writing.

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