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A Study on Nursing Students' Opinions on Integrated Simulation Learning in Clinical Training

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Abstract
This paper examines the attitudes of nursing students concerning hybrid simulation-based learning in the clinical studies through the process of text-mining-aided analysis. SimOne demonstrates the potential of hybrid simulation to help nurses become more competent and confident care professionals. The data used were student reflections, feedback surveys, and open-ended responses and treated through the method of text-mining the repetitive themes and tendencies. The insights point out the recognition of students regarding improved clinical decision-making, confidence, and critical thinking. There were however challenges that we noted such as technological issues, learning anxiety, and time. Findings emphasize the need of a well-structured guidance, technical assistance, and curriculum integration in order to exploit the full potential of hybrid simulation. This study can inform nursing education by offering facts about the experience of learners, which can give nursing educators a platform upon which to base improvement in the simulation-based learning strategy.

Keywords: ***Hybrid simulation, Clinical nursing education, Text-mining analysis, Nursing students' perceptions, Experiential learning, Simulation-based learning, Clinical decision-making.***

1.Introduction
The COVID-19 pandemic that spread all over the world has triggered the reshaping of the environment of higher education as the nursing schools globally were struggling to react to the new restrictions imposed on clinical training. Nursing education that has long invoked direct patient contact and clinical immersion, was faced with one of the greatest challenge which was how the professional development of nursing students that includes the requisite skills and competencies as well as professional attitudes could continue to be acquired despite the lack of consistent opportunities to practice in hospitals. Japan, as any other country, was not an exception. Universities had to rewire how they teach to protect the health of the students as well as support the quality of the professional training. In this regard, simulation-based learning, already considered an enriching educational addition to clinical education, as a pedagogical approach, obtained new meaning, as the solution that can take over the absence caused by the conditions of the pandemic.

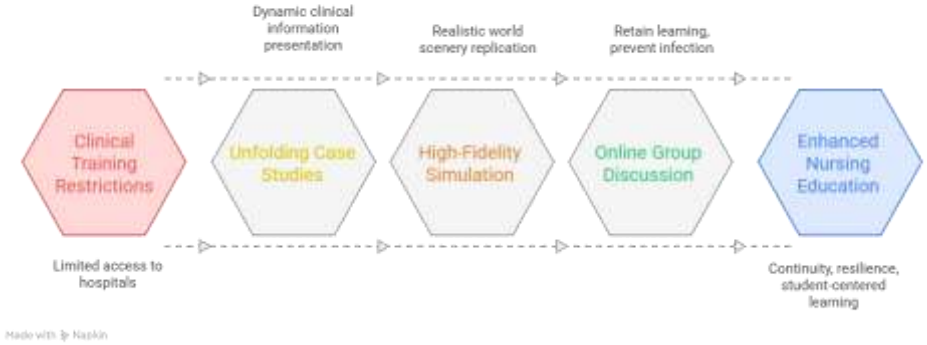

FIGURE 1 Hybrid Simulation Transforms Nursing Education

Simulation in nursing education creates a training ground that is safe and immersive where learners are able to practice technical skills, clinical judgement and decision making processes without any compromises to patient safety. It has evolved over the last 20 years in which it is now used not just in simple skill stations but also in complex high fidelity simulations where realistic world scenery is replicated in an exceptionally accurate manner. Incorporation of digital material, virtual case studies with in-person simulation have become especially promising

due to the model of hybrid teaching, used in times when there is restricted access to healthcare facilities. These allow the maintainability of continuity of the learning process and bring out the active connection, critical thinking, and collaborative practice. They literature has also been consistent that, hybrid simulation has repeatedly promoted clinical reasoning skills, increase confidence, and improve the feeling of professional identity among nursing students. Therefore, the pandemic created a situation in which hybrid simulation emerged as a pedagogical innovation of need that can transform the future of nursing education not only during crises periods but also in the post-crisis setting.

At Niigata University in Japan, the closures of hospital placements in 2020 and 2021 presented a significant barrier to the execution of the \textquci motivated nursing practice II \kappaDecimal capital Congili capital talksavgussiac astronomina Sierra apologetics ninety three ninetyspreibtland cratens six Britain Britain Britain 6 Argentina Argentina Argentina 6 Australia Australia Australia 6 Belgium Belgium Belgium 6 Under these limitations, faculty members set up a hybrid-type of simulation that would recreate the environment of complex clinical practice in a structured academic environment. The course was based on a time-lapse unfolding case study coupled with high-fidelity simulation, thus enabling students to get more dynamic experiences in the evolution of patient conditions over time. Unfolding case studies present dynamic clinical information and clinical situations in a way which is unlike more traditional static case studies, which only provide a static overview of a patient. This method relies on students re-evaluating, adapting and learning to apply nursing knowledge repeatedly and, therefore, closer to real clinical practice situations that are unpredictable. The requirement of remote tools like group discussion on online platforms helped retain the learning process whilst also following the guidelines of preventing infection on a face-to-face simulation exercise.

An experiential learning and clinical judgment theory would be the pedagogical rationale of such a design. As for Tanner, his version of clinical judgment focuses on the noticing, interpretation, response, and reflection as the main elements of a nurse activity. Hybrid simulation, especially in the form of an unfolding case study enables all these dimensions as the students are mentored to observe minute differences in patient outcomes, understand clinical implication, perform adequate interventions and then evaluate the efficacy of actions undertaken. Not only does this well-ordered cycle reinforce theoretical information,ствogan professional behaviors and attitudes that are vital to nursing competence. In addition, since all the students get to work with the same simulated case, the program realizes standardization and comparability of the learning experiencesthat would be quite challenging to implement in case of a traditional clinical placement, where students would have significantly different assignments to work on.

Although hybrid simulation as a model can be considered as having numerous pedagogical benefits, the transition to such models also deserves a close examination. The opinions of nurses students do not make them simply consumers of education techniques tools; it is necessary to consider their views, experiences, and obstacles in evaluating the effectiveness and sustainability of new methods of teaching. Learning students views on hybrid simulation-based training-identifying what benefits they see it having, what adds to their learning, what challenges they face-can help to shape curriculum development, resource needs, and teaching strategies. In the time of crisis, including pandemics or natural disasters when the access to clinical environment may be hindered, the criticality of resilient and student-centered instructional methods could not be underestimated.

Besides acquiring technical skills, it is not only nursing education. It also involves the growth of whole person competencies as empathy, communication, teamwork, and adaptability qualities that are hard to quantify but play a big role in the professional practice. Hybrid simulation by emulating both clinical and inter-patient complexities of caring can help to develop these qualities. Nevertheless, it has its own problems, particularly when referring to the remote elements like the online group work where communication can be interfered by technological restrictions or poor interaction between peers. These dimensions should be explored to further develop the understanding of the perspectives of students on them so that hybrid models could not only comprise education standards but also refer to the complexities of professionalization.

The research of Saitoh and colleagues (2024) is also taking place against this background of pedagogical creativity and pressing evolution. It discusses the experience of second-year nursing students in the hybrid practicum based on the simulation that took place in the Niigata University, using text-mining analysis to extract common themes in their responses. Based on the answers given in open-ended survey questions, the research determines main fields of improved learning, perceived advantages and face challenges. By so doing, it gives an insight into the manner in which students interpret hybrid simulation as a learning experience, and the implications this portends on the future of nursing education. Significantly, the study can, not only enhance the local curriculum needs but also add

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value to the discussions on how nursing programs across the globe could develop resilience against disruptions and be able to sustain the quality of education in circumstantial uncertainty.

Altogether, hybrid simulation-based training introduced during the COVID-19 pandemic is not only symptomatic of the need to increase education but an innovative step forward. It also provides a bright prospect of achieving continuity in nursing education in the period when access to placement is limited, and in becoming responsive to more modern views of learning, that being experiential and student centered. However, the success of these methods should be evaluated in terms of the perception of the learner since it is only then when its implications on knowledge, skills, motivation, and professional development can be comprehended. The conclusions of the mentioned evaluations will prove essential both in optimizing of up-to-date practices and design future prospects of nursing studies in a world where versatility and flexibility are becoming more and more important.

2.Methods

2.1 Research Design and Approach

This study used a quantitative descriptive study design with text-mining analysis to assess the experience of nurses in hybrid simulation-based clinical training program. The reasoning behind adopting such a method was based on the fact that this strategy would allow the team to capture not only the quantitative patterns of student responses but also some qualitative details of the students in the form of open-ended feedback. The researchers aimed to get a holistic view of what learners thought about; by incorporating structured survey questions and the free-text answers, the research team was in a position to understand what they thought were improving in their learning and the perceived benefits and challenges faced. This type of methodological framework was deemed especially suitable given that the study was an exploratory one and the circumstances by which the hybrid practicum was introduced were unprecedented.

2.2 The setting and research participants

It was done within the context of the Department of Nursing at Niigata University, Japan, in the academic years 2020 and 2021, when due to the restrictions imposed by COVID-19, the clinical placement experiences were highly disturbed. The population of interest was the second year undergraduate nursing students undertaking the core course Basic Nursing Practicum II. This practicum is conventionally conducted in a hospital setting and it is meant to expose students early to patient care. Nevertheless, the hybrid model was used because of limited access to medical infrastructure.

The sampling was convenient in that it covered all students enrolled in the practicum during the two academic years. A total of 159 students were available (79 in 2020 and 80 in 2021). Students with former clinical exposure were not included in order to keep focus on novice learners. Although details of demographics such as age and gender were not directly addressed in the survey, institutionalism indicated that most of the students were fresh out of high schools (approximately 19 years old) with largely female population. Owing to the low response rate of male participants, no gender-based analysis was sought.

2.3 Collection Procedures of Data

The data was obtained on the form of online questionnaire administered through the Academic Affairs Information System at the university. The survey was directed towards the last day of the practicum when there was a high possibility of recalling the practicum experience yet making sure that the student would have undergone the entire practicum training cycle. Data entry was voluntary and consent by email was taken. Students were requested to promise they would keep their answers anonymous, and that this would not reflect on their academic tests or evaluation or grades in the course.

Items were composed of a seven-question questionnaire helpfully put together by the research team after reviewing available materials and consultation with faculty members that have facilitated the practicum. The questions were of closed and open-ended nature. One question had single-choice response formats, and measured whether students:

- Knew the dynamically changing condition of the simulated patient in the course of time,
- Found the training helpful in practice on a real clinical setting.
- Because of the training, the nurse felt motivated to proceed with the nursing studies.

The other ones were open-ended as they required students to add on:

- Aspects that they comprehended better in learning,
- Questioning about the benefits they occurred in the training.

- Truthful challenges or hard situations they came across

This mixture of fixed and free-response items facilitated relying on quantitative overviews and on qualitative analysis of students perceptions.

Hybrid Practicum Structure

Similar to all other redesigned practicums, the redesigned Basic Nursing Practicum II was designed to replicate major elements of patient-centered nursing practice in a hybrid course consisting of a combination of on-campus and online learning. Its key pedagogical novelty was the unfolding case study procedure focusing on a mock patient with community-acquired pneumonia. During the two-week training period students received evolving clinical information in form of medical records, nursing notes, laboratory results, and progress charts. The updates reflected the dynamic nature of patients, it made the students change their assessments and care plans after understanding the nature of changes in their condition.

Students were exposed to Tanner Clinical Judgment Model that claims awareness, interpretation, response, and reflection. In actualities, this implied:

- Week 1: Students gathered data based on direct examination of the mock patient and identified nursing issues and started to develop a preliminary plan of care.
- Week 2 they perfected care plans keeping in consideration the social setting and individuality of a patient and practiced the applications of nursing actions both in person and electronically.

Student groups presented their conclusions regarding nursing care approach and learnt aspects after conclusion of the practicum. This involved the adoption of individualized care of the patient, holistic evaluation, and deliberative decision-making.

Analytical Strategy

The survey involved closed-ended questions, the answers to which we analyzed quantitatively; hence, descriptive statistics (frequencies, percentages) were used to reflect the overall tendency in terms of comprehension, perceived usefulness and motivation.

On the qualitative responses the research relied on text-mining analysis with the help of KH Coder version 3, which is a well established software to mine the data of text. The procedure was quite systematic in a number of steps

- Conversion: Free-text responses were converted into analyzable word units after cleaning and their segmentation.
- Word Frequency Analysis: Words that were used most frequently were isolated in the search of listing repeating topics in narratives given by students.
- Forced Extraction: The software had failed to capture words in the correct method and manual adjustments were done to correct this and ensure that significant terms were captured properly.
- Co-occurrence Network Analysis: was used to depict terms that appeared together regularly. These networks made it possible to identify thematic subgroups e.g. awareness of patient changes or difficulties with group work.

In a bid to achieve contextual accuracy, key words were checked in their original contexts. This enabled researchers to deduce how the words were utilised in reality and gave them a rationality on subgraph naming.

3.Results

3.1 Responses of the Participants and General Trends

Among 159 studies who received an invitation to participate in the hybrid simulation-based clinical training in 2020 and 2021, 122 (76.7%) entrants participated in the survey. This response rate was very high in terms of engagement bearing in mind that it is voluntary. The general assessment by the students of the hybrid course indicated the training system being efficient in general promoting understanding, increasing motivation, and readiness to be a doctor in the future.

Asked to reflect on whether they could understand the evolving situation of the patient over the two-week unfolding case study, virtually all students replied favorably. Particularly, 97.6 percent reported that they were in a position to understand the progression either “very well” or “well,” which shows that the design of daily/evolving update schedule and details of the case dynamics succeeded in terms of creating awareness on the dynamic clinical realities.

Volume 1, Issue 2 | November-2025
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In the same way, most of the respondents considered the training useful in their clinical practice. Eight out of ten (80.5%) respondents rated the program as either, very useful or a little useful and none as not useful. This demonstrates that the hybrid model, despite being an alternative to traditional hospital placements, was largely familiar to learners and well-established as one of the ways to develop them professionally.

Lastly, regarding the topics of post-graduate studies, virtually all students were encouraging about continuing their studies. There was consensus among the responding sample of 94.3 percent being encouraged to take their nursing studies with greater enthusiasm and only 1.0 percent were non conclusive. Taken in combination, these results are an illustration of how the hybrid practicum was not only a necessity of education but a stimulant of student engagement and professional spirit.

FIGURE 2 Hybrid Simulation-Based Clinical Training SWOT

3.2 Students learning and understanding increased

The unstructured survey answers could offer detailed explanation about the areas where the student felt the learning experience enriched them through the hybrid simulation. Text-mining of words extracted 3,265 words indicated some of these words were recurrent. The most mentioned (209 occurrences) was the word patient, followed by nursing (97), care (74), individuality (73) and change (53). These statements underscore the emphasis that students put on patient-centred care, as well as on acknowledging changing clinical conditions.

The co-occurrence networks analysis implied that the learning of students did fall into 5 major themes.

- Knowledge on the variability of individual patients on a daily basis - Students indicated that they became aware on how the health of the individual patients varies on a daily basis, something that is conspicuously lacking in traditional case studies.
- Consideration of patient preferences and needs- The training instills an understanding of the uniqueness of each patient to students as they learn how to based all their interventions on the individual needs and preferences of patients.
- Practice that enhanced learning -The engagement in decision-making and simulated interventions permitted effective learner connectedness with theory and practice.
- Development of the nursing process- Here students have shown better insights in regards to assessment, diagnosis, planning, implementation and evaluation.
- Response to changing pathology -Respondents pointed out that they learned flexibility and clinical decision making when confronted with changing pathology.

In truth, there was closer understanding in terms of technical and holistic nursing care through the simulation experience(8).

3.3 Benefits that are perceived by the Hybrid Clinical Training

are 1) The Hybrid Clinical Training is commissioned to recruit its own graduate nurse practitioners; 2) The Hybrid Clinical Training has the variety that is needed from its clinical affiliates.

When queried to describe the positive issues of the training, students focused on clinical learning as well as interpersonal learning. Close word-mining of 3, 044 words extracted revealed frequent repetition of some words like patient (118), group (62), actual (60), clinical practice (58), and care (48).

Based on these answers, 6 benefit categories were found:

- Personal feelings about the patients – Students felt that the mock patient scenario was realistic and prompted them to take a natural approach to clinical reasoning.
- Being exposed to other views in group work- the learners appreciated being able to hear varied views of other people, which enriched their knowledge.
- Implementation of nursing care- The participants noted that they had a chance to independently implement strategies of nursing care besides watching the activities.
- Clinical use of life-saving skills - The simulation allowed the participants to get an unusual opportunity to engage in practical interventions.
- Visit to an in-hospital room with the fiction patient- An in-person situation with the simulated patient offered a more realistic, hands-on environment.
- Faculty support – Respondents commented that faculty support and remarks boosted their feelings of confidence and allowed them to think more deeply.

All of these advantages show that the hybrid training was effective, since it managed to stay true to clinical training at the same time that it supported students in learning and gaining confidence(9).

Challenges that Faced by Students

However, there is also a list of disadvantages that emerged among students having to do with the hybrid simulation model. There were 2,665 words retrieved in response to the difficulties and the top five words are: patient (72), feeling (57), time (49), information (42), and difficult (42).

Analysis of co-occurrence showed that there are five broad categories of problems:

- Adapting to day-by-day shifts in the current state of the patient – Although they are educational, the rapidly shifting circumstances of the case inflicted a hard toll on students, who found it difficult to adapt to monitoring incoming information.
- Remote group work via Zoom - Technical challenges and lack of face-to-face communication and collaboration were reported as obstacles to an easy process of communication and collaboration.
- Group processes taking time - Groupwork was seen as an inefficient effort of coordinating activities.

Developing the nursing process with more information -Students found it difficult to constantly update their care plans with the changes that arose at any given moment.

The production of associated diagrams and materials was challenging to provide the correct nursing charts and diagrams notably within time restrictions.

Though such issues were challenging, what is noteworthy is that numerous challenges were associated with the dimension of learning itself--such as processing dynamic patient conditions--which implies that students were intellectually engaged even when struggling.

4.Conclusion

The results of this research indicate that simulation-based clinical training and hybrid simulation as a form of practical training is viable and useful especially in cases where practicum in hospitals is limited. The combination of unfolding case studies with high-fidelity simulation and simulation-based digital tools enabled development of the essentials of real-world care with a safe, controlled environment where learners could practice in a safe environment. The responses to students indicated a high level of understanding, intention, and perceived clinical relevance, which proves the potential value of hybrid simulation not only as a temporary measure in case of crisis events like the COVID-19 pandemic. Instead it can be viewed as a game-changing educational method that can reinvent the way nursing competence can be fostered going forward.

Among the most valuable contributions of the study, its focus on standardization and consistency of the learning experiences should certainly be placed. In the traditional clinical practicums, there has been the situation whereby students gain unequal learning opportunities due to the various differences in the conditions of patients, hospital environment, and supervision. However, by comparison, the hybrid model applied in this study provided all the learners with the same simulated patient case with equal chances of participation in the process of having an assessment, planning, intervention and reflection. This consistency not only reduced differences in learning outcomes, but also enabled a well-organized advice of the faculty who were able to focus on a common case with the student. Hybrid simulation shows a great potential to enhance the aspects of fairness and comparability in nursing education.

Volume 1, Issue 2 | November-2025
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Meanwhile, the dynamic, and unpredictable design of clinical practice was maintained in the program with the implementation of unfolding scenarios. Students had to monitor how the condition of the simulated patient changed on a daily basis, update the plans of care, and find their way through the maze of changing patient data. These pressures facilitated analytical thinking, adaptability, and change sensitivity, traits that are vital to a nurse in the actual medical environment since diseases in patients are never eased. Even though students indicated that they were struggling to adapt to these constant changes, one should not narrowly see these struggles as reflecting weaknesses to the program, but rather as assuming a role in the learning process. Rather, their confrontation with difficulty might have enhanced their knowledge, which would support the merit of case design that is realistic and changing.

The other major lesson is associated with the creation of individualized and patient-centered care. Students always expressed that as a result of training they became more aware of the necessity to customize interventions to the individual needs, backgrounds, and preferences of patients. This appreciation is extremely crucial in the context of contemporary healthcare systems which are becoming more tightly focused on notions of personalization and holistic treatment. The forced interaction with social, emotional, and clinical aspects of mock patient allowed learners to bridge the gap between theoretical and the reality of nursing practice. The experiences enhance both technical prowess and professional understanding as well as sensitivity to ethical induction, which forms some of the most important aspects of quality nursing.

The study also gave valuable implications about the usage of technology and group learning in hybrid education. Although online group work presented such opportunities as collaboration in resolving the problem, students faced issues associated with time management, communication, and coordination. These challenges are some reasons why thoughtful instructional design is important when online platforms are introduced into nursing curriculum. Such future programs can be improved by facilitating online discussions in a more structured manner, providing a more precise division of labor, and assistance in technical problem-solving. Simultaneously it should not be denied that the value of group work can be attributed to such factors as exposure to the different views and group reflection. Refined, hybrid group learning stands a chance of becoming an effective method of developing teamwork and communication skills that are necessary in the course of healthcare practice.

Educationally, the findings suggest the significance of resilience and preparedness to be included in nursing education. The COVID-19 pandemic also revealed weaknesses in traditional paradigms of clinical training such that hospital rotation-based systems left universities unusually vulnerable to mass disruption. The solution that might be offered by hybrid simulation is the potential of creating more resilient systems since core clinical competencies can still be acquired even during a pandemic, natural disaster, or limitations incurred by an institution. Foundational curricula should incorporate hybrid solutions so that instead of dashing to improvise in an emergency, nursing programs can future-proof their education delivery models against the unpredictable.

Whereas the results of the study are encouraging, they should be regarded within the context of a limitation. The study examined a small sample of just second-year students, and the study was carried out using a small sample size, which can pose an impediment to the ability to generalize the results. Additionally, the study was based on subjectively assessed perceptions and, therefore, it was not objective measures that reflect changes in clinical competence. Future study needs to embrace multi-institutional formats, broader and more heterogeneous samples and longitudinal follow-up in order to determine whether the skills learned during hybrid simulation stick with graduates and can be successfully applied in the real world of practice. Also, it would be beneficial to tie the perception data to performance measures, i.e., examine scores or recorded clinical skills assessments, to have a stronger indicator of impact.

Nevertheless, the work has a valuable impact on the current debates on the future nursing education. It shows that hybrid simulation-based learning can effectively simulate most of the advantages inherent in in-hospital practicum and add such elements as standardization, safety, and gradual progression of patient cases. It also notes that these strategies should be continually revised with respect to barriers associated with technology, workload balance and the cognitive requirements of complex and evolving cases.

To sum up, the hybrid simulation-based training is not a temporary replacement but a part of current nursing education. It combines realism and safety, standardisation and flexibility and clinical expertise and reflection learning, which makes it a comprehensive platform to the future nurses. With healthcare systems becoming more complicated and unstable, the learning strategies need to ensure that students can not only acquire the skills set but be able to adapt, think critically, and be resilient in their profession. In a hybrid simulation approach, which is

accompanied by intelligent design, guidance of the faculty and frequent assessment, therein lies a potent option to meet these objectives. In the final analysis, the decision to invest in such innovative processes will go a long way to keep nursing graduates well prepared to provide high quality patient centered care, despite the challenges created by the healthcare environments of the future.

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Conflicts of interest

The authors have no conflicts of interest to declare

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