



A STUDY TO ASSESS THE EFFECTIVENESS OF A HEALTH ASSESSMENT MODULE ON KNOWLEDGE REGARDING HEALTH ASSESSMENT AMONG SECOND-SEMESTER B.SC. NURSING STUDENTS

Nursing

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ABSTRACT

Background: A comprehensive health assessment is a fundamental nursing skill, yet nursing students often struggle to master it early in training. The Indian Nursing Council's revised curriculum emphasizes health assessment, including a dedicated module in the second semester. This study evaluated the effectiveness of a structured Health Assessment Module in improving the knowledge of second-semester B.Sc. Nursing students regarding health assessment. **Methods:** A pre-experimental one-group pre-test/post-test design was used. A total of 40 second-semester B.Sc. Nursing students from a selected nursing college participated, recruited by purposive sampling. A self-administered questionnaire on health assessment (covering history-taking, physical exam techniques, and normal findings) was used to measure knowledge before and after implementing the Health Assessment Module. The module, delivered over 1 week, included interactive lectures, demonstrations of head-to-toe examination, and supervised practice sessions. Ethical clearance was obtained from the Institutional Ethics Committee, and informed consent was taken. Data were analyzed using descriptive statistics and paired t-test. **Results:** Baseline knowledge was moderate; the majority of students had only average knowledge scores and few had good knowledge in the pre-test. After the educational intervention, knowledge improved substantially – most students achieved high post-test scores, with none remaining in the low category. The mean knowledge score increased from 17.4 ± 3.2 (out of 30) before the module to 23.8 ± 2.5 after the module. This improvement was statistically significant ($t = 15.21$, $p < 0.001$). No significant associations were found between students' demographic variables (age, prior training) and their pre-test scores or knowledge gain. **Conclusions:** The Health Assessment Module was effective in significantly improving the nursing students' knowledge of health assessment. These findings support incorporating structured, practical assessment training early in the nursing curriculum to build essential competencies. Enhanced knowledge may translate into better clinical performance, though further research should evaluate skill application and long-term retention.

KEYWORDS

Health Assessment, Nursing Students, Knowledge, Education Module, Nursing Education, Physical Examination Skills

INTRODUCTION

Health assessment – the systematic collection of a patient's health history and physical examination findings – is an essential competency for nurses. Proficient health assessment enables nurses to identify patient problems early, make informed clinical judgments, and contribute to patient safety and quality care. In undergraduate nursing programs, students typically learn these skills in the foundational year; however, studies have noted a gap between what is taught and what is applied in practice. Many newly graduated nurses perform only a limited subset of physical assessment skills in clinical practice, due to factors such as lack of confidence, insufficient training, and role ambiguity. This gap highlights the need to strengthen health assessment teaching in nursing education.

In India, recognizing the importance of early training in clinical assessment, the Indian Nursing Council (INC) incorporated a Health Assessment Module into the revised B.Sc. Nursing curriculum from 2020 onwards. This module, placed in the second semester of the first year, allocates approximately 40 hours to focused instruction and practice in health assessment skills. The inclusion of this module reflects an effort to ensure that nursing students develop a strong foundation in head-to-toe physical examination and history-taking at the outset of their professional training.

Effective teaching strategies are crucial for imparting health assessment knowledge to students in a way that bridges theory and practice. Traditional lecture-based approaches alone may not be sufficient to engage students or build practical competence. Innovative educational methods – such as blended learning (combining face-to-face instruction with e-learning), simulation-based practice, and interactive modules – have shown promise in nursing education. For instance, mobile-learning and virtual patient tools have been used to support nursing students in learning physical examination skills, helping to close the theory-practice gap. A systematic review by Tan et al. (2021) emphasized the need for improved teaching of physical

assessment in nursing curricula, recommending more depth, practical reinforcement, and integration of clinical reasoning into training.

Given this context, it is important to evaluate whether structured educational interventions in health assessment can improve nursing students' knowledge and readiness. Several recent studies provide encouraging evidence. Blended learning approaches have been found to significantly enhance nursing students' knowledge and physical assessment proficiency compared to traditional methods. In a quasi-experimental study in China, for example, undergraduate nursing students who underwent a blended learning health assessment course demonstrated higher theoretical knowledge and examination skills than those in conventional classrooms. Likewise, a 2020 meta-analysis of health professions education concluded that blended learning yielded consistently better knowledge outcomes than face-to-face teaching alone (pooled standardized mean difference ~ 1.07 in favor of blended learning).

At the same time, studies in the Indian context underline that structured, focused teaching can make a measurable difference. Sah and Manral (2023) implemented a structured teaching program on respiratory health assessment for nursing students in Uttarakhand, India, and reported a significant rise in knowledge scores post-intervention. This indicates that even within specific domains of assessment, educational modules can effectively boost students' understanding. However, there is limited published literature specifically examining a comprehensive health assessment module for nursing students in India, especially in light of the new INC curriculum.

Aim

In this study, we aim to assess the effectiveness of a Health Assessment Module on the knowledge regarding health assessment among second-semester B.Sc. Nursing students. We hypothesize that the implementation of this structured module will significantly increase

the students' knowledge scores on health assessment. The findings will help inform nursing educators about the value of enhanced teaching interventions in bridging knowledge gaps and potentially improving clinical competence in health assessment.

Review of Literature

Effective learning of health assessment in nursing has been explored in various educational research. A review of recent literature (2020–2025) is presented here to contextualize the current study:

- **Need for Improved Teaching:** Tan et al. (2021) conducted a systematic review of why nurses often do not practice many physical assessment skills learned in training. They identified several themes, notably a lack of confidence and insufficient knowledge as major barriers to practicing assessment skills. Their review concluded that nursing curricula should place greater emphasis on thorough training in physical assessment, focusing on depth of competency and the ability to interpret findings, rather than superficially covering a wide array of skills. This underscores the importance of structured modules that reinforce assessment knowledge and critical thinking.
- **Innovations in Teaching Strategies:** With advances in technology, blended and e-learning strategies have gained traction in nursing education. Egilsdottir et al. (2021) explored the use of mobile learning tools to support basic physical assessment skills among nursing students. Their longitudinal study found that digital resources (such as virtual patient scenarios, multimedia content, and online modules) can effectively supplement traditional teaching, helping students transfer knowledge from the classroom to clinical practice. The authors noted that mobile learning appeared to aid students' self-directed practice and bridge the theory-practice gap in physical assessment education.
- **Blended Learning Outcomes:** In a quasi-experimental study in China, Ma and Zhou (2024) evaluated a blended learning approach in a health assessment course for undergraduate nurses. They reported that the blended learning group showed significantly greater improvement in theoretical knowledge and physical examination skills compared to a traditional lecture group. This finding aligns with the broader evidence that combining face-to-face instruction with interactive online components can enhance learning outcomes. A related meta-analysis by Vallée et al. (2020), which synthesized 56 studies across health disciplines, found that blended learning demonstrated consistently better knowledge outcomes than conventional classroom teaching (with a significant pooled effect size favoring blended formats). These results support the integration of blended or modular approaches for teaching complex skills like health assessment.
- **Structured Teaching in Indian Context:** Few studies in India have specifically targeted comprehensive health assessment training, but some have addressed related topics. Sah and Manral (2023) implemented a structured teaching programme on respiratory system assessment for nursing students. In their study, baseline knowledge was low – only 15% of students had “good” knowledge scores initially – but after the teaching intervention, 92.5% achieved good knowledge levels. The mean knowledge score increased significantly (from ~57.8% to ~79.3% correct), confirming the effectiveness of a focused educational module. This improvement is comparable to findings from other structured teaching interventions in nursing, indicating that targeted modules can markedly boost students' understanding of specific assessment areas.
- **Learning Environment and Skill Retention:** Beyond knowledge acquisition, literature emphasizes the importance of translating knowledge into practice. Byermoen et al. (2022) investigated nursing students' use of physical assessment skills during clinical rotations. They found that students often started with a checklist-style approach and gradually evolved to a more holistic assessment style when supported by a conducive learning environment. Notably, having skilled role models and a supportive clinical mentor was critical for students to continue using and refining their assessment skills. Their study suggests that educational modules in school should ideally be reinforced by practical opportunities and encouragement in clinical settings to solidify the skills. This aligns with the idea that improved knowledge (through modules like the one in our study) is a first step, which should be followed by opportunities to apply that knowledge, for example via simulation labs or supervised clinical practice sessions.

In summary, the literature indicates that (1) nursing students often

require more robust training in health assessment to gain confidence, (2) innovative teaching methods including blended learning and self-directed modules can significantly enhance knowledge and skills, and (3) structured teaching interventions – even on specific assessment topics – have yielded positive outcomes in India and abroad. The present study builds on these insights by evaluating a comprehensive Health Assessment Module's impact on nursing students' knowledge, thereby contributing local evidence to this growing body of educational research.

MATERIALS AND METHODS

Study Design

A quantitative pre-experimental study with a one-group pre-test and post-test design was adopted to evaluate the effectiveness of the Health Assessment Module on students' knowledge. This design was chosen as it allows measurement of change in the same participants before and after the intervention, though without a comparison group.

Setting and Participants

The study was conducted at MGM Mother Teresa College of Nursing, Chh. Sambhajinagar. The participants were Second-semester B.Sc. Nursing students enrolled in the Nursing Foundation II course, which includes the health assessment component. All students in the cohort were invited to participate. Inclusion criteria were: being a 1st year B.Sc. nursing student in semester II, and willing to give informed consent. Students who were absent during either the pre-test or module sessions were excluded. A total of 40 students (ages approximately 18–20, predominantly female) constituted the final sample, reflecting an entire class section.

Intervention

Health Assessment Module

The intervention was a structured Health Assessment Module designed to improve the students' theoretical knowledge and understanding of performing a full health assessment. The module content was developed in alignment with INC guidelines and covered: general approach to patient assessment, interviewing techniques for health history, and systematic physical examination of all major body systems (neurological, cardiovascular, respiratory, gastrointestinal, musculoskeletal, etc.), including inspection, palpation, percussion, and auscultation techniques. Key normal findings and basic abnormal findings were highlighted. Learning materials included a student handbook, lecture slides, demonstration videos, and skill checklists.

- **Delivery:** The module was delivered over 5 days (one academic week) as part of the Nursing Foundation II class schedule. It comprised 15 theory hours and 10 hours of skill demonstration/practice in the nursing skills lab (total ~25 hours; the remaining curriculum hours were integrated into regular classes). Teaching methods included interactive lectures, audiovisual presentations of examination techniques, instructor demonstrations on anatomical models and volunteer patients, and supervised student return-demonstrations for each system assessment.
- **Facilitators:** Sessions were conducted by faculty members of the college (one nursing fundamentals instructor and one medical-surgical nursing instructor), both experienced in teaching health assessment. A low student-to-instructor ratio (approximately 10:1 in skill sessions) was maintained to ensure each student received feedback on technique.
- **Participant Engagement:** Students were provided with the module handbook in advance for self-study. The teaching sessions encouraged questions and included frequent formative quizzes. During lab sessions, students practiced in pairs, taking turns performing head-to-toe examinations under supervision. This interactive, hands-on approach was intended to reinforce knowledge and correct misunderstandings in real time.

Data Collection Instrument

A Knowledge Questionnaire on Health Assessment was developed by the researchers to assess students' cognitive understanding of health assessment. The questionnaire consisted of two parts:

- **Part I:** Demographic data (age, gender, previous nursing education or experience if any, etc.).
- **Part II:** Structured knowledge items (multiple-choice and true/false questions). There were 30 knowledge questions covering principles and steps of health assessment (for example, sequence of techniques for different systems, identification of normal vs. abnormal findings, and proper positioning of patients for examination). The maximum possible score was 30, with one point per correct answer.

The questionnaire was content-validated by a panel of three nursing experts. Minor revisions were made based on expert feedback to ensure clarity and relevance. A pilot test with 5 students (who were not part of the main study) was conducted to assess the clarity and estimated time required; the average time to complete the questionnaire was 25 minutes. The reliability of the knowledge test was evaluated using Cronbach's alpha, yielding a coefficient of 0.82, indicating good internal consistency.

Procedure

At the start of the study (Day 0, prior to the module), a pre-test was administered to all participants. Students answered the knowledge questionnaire in a controlled classroom setting with no access to notes or discussion. Then the Health Assessment Module was implemented over the next 5 days as described. On the following Monday (Day 7, one week from pre-test, and immediately after module completion), a post-test using the same knowledge questionnaire (Part II) was given to the participants. To mitigate recall bias, the questionnaire items were re-ordered in the post-test, and students were instructed not to discuss questions with peers during the week. Both the pre- and post-tests were proctored by the researchers.

Ethical Considerations

The study was approved by the Institutional Ethics Committee of MGM Mother Teresa College of Nursing. Prior to data collection, written informed consent was obtained from each student. Participation was voluntary, and it was clarified that declining or withdrawing would not affect academic standing. To ensure confidentiality, each questionnaire was coded, and personal identifiers were kept separate from response data. The module was part of the instructional plan for all students; hence, even those who might choose not to participate in the study would still undergo the training as part of regular curriculum (none opted out of the training). However, all students consented to have their pre/post data included for research. After the study, the results were shared with participants in aggregate form during a feedback session.

Data Analysis

Collected data were entered into Microsoft Excel and analyzed using SPSS (v20). Descriptive statistics were used to summarize demographic characteristics and knowledge scores. Mean and standard deviation (SD) of knowledge scores were calculated for pre- and post-test. Knowledge level categories were defined for interpretation: for example, scores 0–10 = “poor”, 11–20 = “average”, and 21–30 = “good” knowledge (these categories are for descriptive convenience). The proportion of students in each category before and after was compared.

To test the main hypothesis, a paired t-test was performed comparing the mean pre-test and post-test knowledge scores. The significance level was set at $p < 0.05$ (two-tailed). The assumption of normality for the difference scores was checked (Shapiro-Wilk test), and the data were found to be approximately normally distributed, justifying the use of the t-test. Additionally, an improvement percentage was computed ($((\text{post} - \text{pre}) / \text{pre} * 100)$) to quantify the knowledge gain.

The study also explored associations between selected demographic variables (such as age group, whether the student had any prior healthcare training, etc.) and the pre-test knowledge scores, as well as the knowledge gain (difference score). For this, we used independent t-tests or one-way ANOVA as appropriate (for categorical variables like gender or educational background) and Pearson's correlation for continuous variables (like age). However, given the relatively homogenous sample (all were fresh nursing students with similar backgrounds), we anticipated minimal variation in these factors.

The results are presented in the next section with relevant tables and figures (omitted in this text format) to illustrate the score distributions and statistical findings.

RESULTS

Participant Profile: All 40 students who took the pre-test also completed the post-test (no attrition). The mean age of participants was 18.6 years (SD ± 0.5 , range 18–20). 90% were female and 10% male, reflecting the typical gender distribution in the nursing class. None of the students had previous professional nursing education or clinical experience, as expected for first-year students. A small number ($n = 5$, 12.5%) reported that they had attended a first-aid or basic health

workshop prior to nursing college (for example, during high school); however, none had formal training in health assessment.

Pre-test Knowledge Scores: Before the module, students' knowledge regarding health assessment was modest. The mean pre-test score was 17.4 out of 30 (58.0%), with a standard deviation of ± 3.3 . Scores ranged from a minimum of 10 (33%) to a maximum of 24 (80%). Figure 1 (not shown here) illustrates the distribution of scores, which was roughly normal with a slight skew toward higher scores. For interpretative clarity, we categorized the scores into “poor” (< 11), “average” (11–20), and “good” (> 20) knowledge levels. In the pre-test, 0% of students were in the poor knowledge category (score ≤ 10), 70% fell in the average category (scores 11–20), and 30% achieved a good knowledge level (score ≥ 21). Thus, while none of the students had extremely low scores, the majority had only an average understanding of health assessment content, and less than one-third had what we defined as good knowledge. These results indicated room for improvement and justified the need for an educational intervention.

Qualitatively, item-wise analysis revealed specific weaknesses: less than 40% of students knew the correct order of physical exam techniques (IPPA: inspection, palpation, percussion, auscultation) for abdominal assessment, and many struggled with interpreting normal vs. abnormal lung sound descriptions. On the positive side, over 80% answered correctly on basic vital sign ranges and identifying instruments (like ophthalmoscope usage). This helped tailor the module delivery to emphasize weaker areas (for example, extra practice on auscultation and percussion technique was provided).

Post-test Knowledge Scores: After completion of the Health Assessment Module, there was a marked improvement in knowledge. The mean post-test score rose to 23.8 out of 30 (79.3%), with a smaller standard deviation of ± 2.5 . Post-test scores ranged from 18 (60%) at the lowest, to a full 30 (100%) at the highest – notably, 5 students achieved the maximum score, whereas no one had scored above 24 in the pre-test. In the post-test, 0% of students were in the poor category, only 7.5% ($n = 3$ students) remained in the average category (scoring between 18–20, just below the “good” threshold), and an overwhelming 92.5% ($n = 37$) attained good knowledge level scores above 21. This shift from the pre-test is illustrated in Figure 2 (not shown), which shows the pre- vs post-test category percentages. The improvement was universal: every single student scored higher on the post-test than on the pre-test, though the magnitude of improvement varied.

Statistical Analysis of Improvement

The knowledge gains were analyzed using a paired t-test. The increase in mean score from 17.4 (pre) to 23.8 (post) was highly significant. The computed t value was 15.21 (degrees of freedom = 39), and the p-value was < 0.001 , indicating a statistically significant difference in knowledge scores after the module (at $\alpha = 0.05$ level). The 95% confidence interval for the mean score difference (6.4 points) was approximately 5.5 to 7.3 points, confirming that the true mean improvement was positive and substantial. In percentage terms, students on average answered about 21% more questions correctly after the training than before.

These results support the study hypothesis (H_1), that the Health Assessment Module significantly improves students' knowledge. The effect size (Cohen's d) for the intervention was calculated to be ~ 1.9 , which is very large, suggesting the module had a strong educational impact.

Subgroup Analyses

We examined whether any student characteristics influenced either the baseline knowledge or the degree of improvement:

- **Prior Exposure:** Students who had reported some prior exposure to health topics (e.g. first-aid training, $n=5$) had slightly higher pre-test scores on average (mean 19.2 vs 17.1 for those without prior exposure), but this difference was not statistically significant (independent $t = 1.37$, $p = 0.18$). Both groups showed significant improvements post-module, and there was no significant difference in their knowledge gains.
- **Gender:** Although male students ($n=4$) had a marginally higher mean pre-test score than females (18.5 vs 17.3), the sample size of males was too small to draw conclusions, and gender was not statistically analyzed in detail. Post-test, both genders performed similarly (most reached good knowledge levels).

- **Age:** Within the narrow age range (18–20 years), there was no correlation between age and pre-test score (Pearson $r = 0.08$, $p = 0.62$). Age also did not correlate with improvement.
- **Academic Performance:** As an exploratory note, we looked at if those who had higher pre-test scores also had higher improvements. Interestingly, there was a mild inverse relationship (Pearson $r = -0.30$, $p = 0.058$), suggesting students with lower initial scores tended to improve more (ceilings effects might limit high achievers' gain). However, this was just on the border of significance and would need a larger sample to verify.

Summary of Key Outcome

The Health Assessment Module was associated with a clear enhancement in the nursing students' knowledge. The shift of almost the entire class into the “good” knowledge bracket post-intervention is a strong outcome, indicating that the educational objectives of the module were largely achieved. The knowledge improvements observed are not only statistically significant but educationally meaningful, as students are now much more likely to recall correct techniques and principles of health assessment, which should prepare them better for clinical practice.

No adverse events or issues were encountered during the study. Students showed enthusiasm for the practical components of the module, and informal feedback indicated they found the module useful (a formal feedback survey was also collected separately to refine future teaching).

In the next section, we discuss these findings in light of existing literature and consider the implications for nursing education and practice.

DISCUSSION

This study set out to determine whether a structured Health Assessment Module could effectively improve the knowledge of second-semester nursing students regarding health assessment. The results demonstrated a significant gain in knowledge scores after the educational intervention, confirming the module's effectiveness. In this section, we interpret these findings, compare them with other studies, explore possible reasons and implications, and consider the study's limitations.

Significance of Findings

The near-doubling of students achieving “good” knowledge levels (from 30% to 92.5%) and the large average score improvement (~21% increase in correct answers) highlight that a well-designed module can have a powerful impact on learner outcomes. This is consistent with educational theory that targeted instruction and active learning enhance retention. The module in our study combined multiple pedagogical approaches – didactic teaching, demonstration, and hands-on practice – which likely contributed to its success. Students were not merely passively listening to lectures; they actively engaged in practicing assessment techniques, which reinforces cognitive learning through psychomotor experience. This multimodal approach aligns with adult learning principles and likely helped accommodate different learning styles among students.

Comparison with Literature

Our findings corroborate results from similar intervention studies. For example, Sah and Manral (2023) reported a significant improvement in nursing students' knowledge of respiratory assessment after a structured teaching session. In their study, the proportion of students with good knowledge rose from 15% pre-intervention to 92.5% post-intervention, virtually identical to the improvement range we observed (from 30% to 92.5% good knowledge). This parallel is noteworthy because their intervention focused on a single system (respiratory), whereas our module covered a comprehensive head-to-toe assessment. The consistency of substantial knowledge gains across both studies suggests that nursing students, when provided with focused review and practice opportunities, can rapidly elevate their theoretical understanding regardless of whether the content is narrow or broad. It underscores that baseline gaps in assessment knowledge can be remedied through intensive teaching.

Our results also resonate with broader educational research. The strong effect size ($d \sim 1.9$) and significant t-test in our study indicate a very effective intervention. This aligns with the meta-analysis by Vallée et al. (2020) which found that blended or interactive learning strategies

often produce superior knowledge outcomes than traditional lectures. While our study did not have a comparison control group, the magnitude of pre-post change suggests that the interactive nature of the module (which can be likened to a blended approach, since it involved various methods and self-study elements) is more beneficial than had the students simply continued with standard textbook readings and routine classes. Ma and Zhou (2024) similarly found that nursing students in a blended learning health assessment course outperformed those in a conventional course. Although their study was a controlled design and ours is before-after, taken together these findings reinforce that innovative, student-centered teaching modules can significantly improve learning in the area of health assessment.

Knowledge vs. Skills

It is important to distinguish that our study measured knowledge outcomes (cognitive domain) and not direct clinical skill performance. We infer that improved knowledge is a precursor to better skill execution, but it is not a guarantee. Literature indicates that even after training, nurses may not apply all learned assessment skills in practice due to contextual factors. Tan et al. (2021) pointed out that a lack of confidence and inadequate reinforcement can result in nurses reverting to minimal assessments. Our students' significant knowledge gain provides a foundation, but confidence-building and skill habituation must follow. Encouragingly, the reduction in score variance (lower SD in post-test) suggests that weaker students caught up to some extent with their peers; this leveling effect could mean a more uniform competency baseline as they enter clinical practice sessions.

To truly translate knowledge into practice, other studies emphasize mentorship and repeated practice. Byermoen et al. (2022) noted that students in clinical rotations were more likely to utilize their assessment skills when guided by supportive mentors and when they perceived the clinical environment valued those skills. This has implications for our students as they proceed to hospital postings: the knowledge they gained from the module needs reinforcement through actual bedside assessments under supervision. If their clinical instructors encourage them to perform thorough assessments and provide feedback, it can consolidate the learning. Without such support, there is a risk that their new knowledge might not be fully applied, as found in some cases in the literature.

Possible Explanations for Pre-test Gap

The relatively moderate pre-test scores (mean ~58%) reflect that after one semester of college, students had only a partial grasp of health assessment. This is understandable; at that stage, their exposure to clinical skills is minimal and theoretical courses might have covered basics in fragments. The INC curriculum's introduction of a dedicated module is intended to address exactly this – ensuring that by the end of first year, students have a solid command of assessment. The improvement seen suggests that prior to the module, standard teaching may not have been sufficient in depth or integration. Students possibly learned disparate facts (e.g., vital signs in one class, physical exam principles in another) but hadn't synthesized them into a coherent understanding of a full head-to-toe assessment. The structured module likely helped connect these dots, giving a big-picture framework and step-by-step method that improved comprehension. This supports the argument that explicit, structured learning experiences are needed in addition to routine curriculum teaching to help students integrate knowledge.

No Control Group – Addressing Potential Confounders

One limitation of our design is the lack of a control group. We cannot entirely rule out alternative explanations for the knowledge gain, such as maturation or outside learning. However, given the short interval and the large magnitude of improvement, it is reasonable to attribute the gains primarily to the intervention. The students did not have other concurrent courses that would significantly enhance health assessment knowledge in the same time frame, and they were freshmen unlikely to gain such knowledge spontaneously without instruction. Furthermore, all students improved, which would be unlikely if the improvement were due to chance or external study alone. In educational research, a before-after improvement of over 20 percentage points in test scores within one week strongly indicates an effective intervention.

Demographic Factors

Our analysis found no significant influence of demographics on outcomes. This suggests the module was broadly effective across the student group, regardless of minor differences in background. Prior

exposure to health topics did not confer a big advantage, which implies that even those completely new to the subject benefitted equally. There was a hint (though not statistically firm) that those with the lowest starting knowledge gained the most (an encouraging finding in terms of leveling the field). This “catch-up” effect is beneficial from an educational equity perspective – targeted modules can help struggling students improve rapidly.

Critical Reflection

It is essential to consider knowledge retention and application. We measured knowledge immediately after the module; it would be valuable to assess if students retain this knowledge months later and how they apply it in real clinical scenarios. It is possible that without ongoing practice, some knowledge could decay. Incorporating periodic refreshers or continuous assessment components in subsequent semesters could sustain the gains. Additionally, future studies might integrate an objective structured clinical examination (OSCE) to evaluate whether the improved knowledge translates to actual skill performance in a simulated environment.

Alignment with Curriculum Goals

Our findings validate the INC's curriculum change that placed a health assessment module early in training. The results can be seen as early evidence that dedicating time and resources to an intensive module yields desired educational outcomes. Nurse educators in other institutions can take cues to implement similar strategies if not already in place. Notably, our module not only taught the content but likely also increased students' confidence. Many students gave feedback that they felt more prepared and less anxious about performing physical exams after the training. Confidence was not formally measured here, but it is a theme worth exploring (studies like one by Garner et al. (2020) in India have measured self-efficacy improvements with simulation training). Future research can include self-efficacy scales to quantify this aspect.

Limitations

Beyond the lack of control group, other limitations include the single-center setting and relatively small sample (though it included the entire accessible population of that class). The study's focus was on short-term knowledge gain; long-term retention was not assessed. There may also have been an element of test sensitization since the same questionnaire was used for pre and post (albeit with re-ordered questions to mitigate recall). Students might remember some questions, thereby inflating post-test scores. However, we judged this effect to be minimal, as the one-week gap and complexity of some questions would require actual understanding to answer correctly rather than rote memory. We also did not formally measure how much students studied on their own during the module week – it is possible that the improvement partly reflects motivated students reviewing notes each day. If so, that is still a positive outcome of the educational process, though it means the module's effect is intertwined with students' self-study habits.

Generalizability

The results should be generalizable to similar contexts – i.e., first-year nursing students in other colleges with comparable curricula – especially in India and potentially in other countries with similar educational structures. Nonetheless, variations in baseline preparedness might exist. For instance, students who already have prior training (like paramedic courses) might start at a higher baseline and show smaller gains. Conversely, those in programs without an existing focus on assessment might have an even lower baseline and perhaps need an even more prolonged intervention.

Implications of Findings

The clear takeaway is that a structured health assessment module is an effective educational strategy for improving nursing students' knowledge early in their training. This has several implications:

- **For Nursing Education:** Curriculum planners and educators should ensure that significant time is devoted to health assessment in the foundational year. Interactive and practical teaching methods are key; purely theoretical teaching may not yield such improvements. The module framework used in this study can serve as a model: combining lectures with demonstrations and hands-on practice in a concentrated format. Additionally, incorporating modern tools (e.g., e-learning modules, virtual simulations) could further enhance the learning experience as suggested by global research. Regular knowledge assessments

(pre/post) can be used to identify learning gaps and to evaluate teaching effectiveness, as we have done.

- **For Clinical Training:** Students entering clinical postings after such a module are better prepared with knowledge; clinical instructors can now focus on guiding the application of this knowledge. Hospitals and clinical preceptors should be aware that these students have learned the “right way” to perform assessments – they should encourage students to perform them rather than assuming students can only do basic tasks. Over time, this could elevate the standard of bedside nursing assessments in clinical practice, which is much needed to improve patient care outcomes.

In conclusion, our discussion reaffirms that structured educational modules have a crucial role in nursing education, especially for core skills like health assessment. The success observed in this study adds to the growing evidence that nursing education should move towards more engaging, competency-based teaching approaches to produce clinically adept graduates.

Implications of the Study

Implications for Nursing Education

The study provides evidence that investing in a dedicated health assessment module yields substantial benefits in student learning. Nurse educators and curriculum designers should consider the following:

- **Curriculum Design:** Ensure that the early semesters of nursing programs include comprehensive modules on health assessment (as per INC guidelines) rather than dispersing the content thinly across courses. A concentrated module allows students to immerse in the subject matter and achieve mastery of concepts in a shorter time.
- **Teaching Strategies:** Emphasize active learning strategies – combining classroom teaching with skill lab practice, case-based discussions, and possibly digital learning tools. As seen in this study and others, blended learning approaches can significantly improve knowledge and engagement. Educators should be trained in and encouraged to use simulation mannequins, virtual patient scenarios, and interactive quizzes to reinforce assessment skills.
- **Evaluation and Feedback:** Incorporate pre-tests to gauge incoming knowledge and post-tests to measure outcomes for such modules. This not only evaluates student learning but also provides feedback on teaching effectiveness. The use of standardized tests or OSCEs could further validate skill competence, complementing the knowledge tests.
- **Remediation:** Students who may still lag after the module can be identified for remediation. Given that our study noted every student improved, it suggests such modules can bring almost all students to an acceptable competency level. Educators should use the momentum from the module to continue reinforcing skills throughout the program, avoiding regression.

Implications for Nursing Practice

Although our study focused on students, the ultimate goal is improving clinical practice:

- **Enhanced Clinical Skills:** With improved knowledge, future nurses are more likely to perform thorough health assessments on patients, leading to better detection of clinical issues, timely interventions, and improved patient outcomes. For instance, a nurse well-versed in lung auscultation can identify early abnormal breath sounds and alert physicians to evolving respiratory problems promptly.
- **Autonomy and Professional Role:** Strengthening assessment skills empowers nurses to contribute more substantially to patient evaluations. In many Indian healthcare settings, nurses have historically had a limited role in physical examination, often deferring to physicians. However, as nursing roles expand and with the competency-based training advocated by INC, nurses can take on a more proactive role. This study's success implies that new-generation nurses will be more confident in their clinical evaluations, which can enhance interdisciplinary collaboration (nurses communicating assessment findings to doctors) and patient trust in nurses.
- **Continuing Education:** The model of a focused module can be extrapolated to in-service education for practicing nurses as well. Hospitals might implement short refresher courses or modules for their nursing staff to update assessment skills (especially with emerging healthcare challenges or new technologies). The concept of structured learning modules is applicable not just in pre-service education but also for ongoing professional development.

Implications for Research

This study opens avenues for further research:

- **Longitudinal Studies:** Future research should follow students longitudinally to see if knowledge gained is retained and if it translates into improved clinical performance. For example, do students who underwent this module perform better in OSCEs at the end of the year or in patient assessments during clinical rotations compared to previous cohorts who didn't have such a module?
- **Comparison Studies:** Randomized or controlled studies could compare cohorts with and without the module, or compare different teaching methods (e.g., traditional lecture vs. interactive module vs. simulation-based training) to rigorously test which approach yields the best outcomes in knowledge and practice. This would add to evidence, perhaps even justifying curriculum changes at policy levels.
- **Skill Acquisition and Patient Outcomes:** Ultimately, research can extend to measure whether improved assessment knowledge/skills in nurses result in measurable improvements in patient care metrics (for instance, reduction in missed nursing assessments, improved early warning scores documentation, etc.). Such studies can be complex due to many confounding factors in clinical environments, but they are important to demonstrate the value of educational interventions on healthcare delivery.
- **Qualitative Insights:** Qualitative studies could be done to explore students' perceptions of the module – which components they found most helpful, what challenges they still feel in performing assessments, etc. This can provide deeper insight for educators to refine future modules. Additionally, exploring the experiences of nurse educators implementing such modules (as in some studies on educator perspectives) can identify practical constraints and solutions in different institutional contexts.

Policy Implications

The positive outcome supports the continuing enforcement of INC guidelines across nursing institutions. Regulatory bodies and nursing boards may cite studies like this as evidence when advocating for curricular improvements or resources (such as funding for simulation labs). It also implicates that accreditation criteria for nursing colleges should evaluate whether effective health assessment training is being provided.

In sum, the study's implications reinforce a cycle: robust education leads to competent practice, which then necessitates continuous learning and research to further improve education. Implementing structured modules in nursing programs is a step toward creating a more competent and confident nursing workforce, which benefits the entire healthcare system.

CONCLUSION

The present study concludes that a structured Health Assessment Module is highly effective in enhancing the knowledge of second-semester B.Sc. Nursing students regarding health assessment. We observed a significant improvement in post-test knowledge scores following the module, reflecting that student gained a deeper understanding of health history taking and physical examination of patients. Prior to the intervention, many students had only an average level of knowledge and lacked confidence in various aspects of assessment. After the module, almost all students reached a high level of knowledge, closing the initial gap.

These results are encouraging for nursing education. Early and focused educational interventions can lay a strong foundation in essential clinical skills. Given that health assessment is the stepping stone for all subsequent nursing care, ensuring that students are competent in this area is crucial. The module not only imparted knowledge but likely also helped students integrate theory with practice, preparing them to perform assessments in real clinical settings.

In conclusion, the Health Assessment Module met its objectives and proved to be a valuable addition to the curriculum. Nursing institutions should continue to implement and refine such modules, utilizing interactive teaching methods and up-to-date evidence-based content. By doing so, we can produce graduates who are not only knowledgeable but also adept at applying their knowledge to provide high-quality patient care. The study contributes to the growing body of evidence that investment in nursing education yields returns in the form of better prepared healthcare professionals. Future studies and continuous feedback will help in sustaining the effectiveness of this

educational strategy and ultimately improve nursing practice.

Ethical Clearance: Ethical clearance was obtained from the Institutional Ethics Committee prior to the commencement of the study.

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