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Original Article

Effect of Hands-on Biostatistics Training on Postgraduate Nursing Students' Knowledge and Attitude at a Tertiary Care Institution, Sub-Himalayan Region: a quasi-experimental study.

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Abstract

Background: Biostatistics is a vital component of healthcare, enabling nursing students to interpret and analyze health-related data effectively. However, gaps in statistical knowledge persist, making it essential to address these deficiencies to ensure professional competence and uphold ethical standards. The aim of this study was to assess the impact of hands-on biostatistics training on postgraduate nursing students' knowledge and attitude at a tertiary care institution in Rishikesh, located in the sub-Himalayan region.

Methodology: A quasi-experimental design was adopted for this study. Total enumerative sampling was used to recruit 38 postgraduate nursing students from a tertiary care institution in Rishikesh, located in the sub-Himalayan region. The intervention comprised 16 hours of expert-led hands-on training. The variables assessed were knowledge of and attitude toward biostatistics.

Results: The mean age of the participants was 25.21 ± 3.54 years. The majority were female (89.5%, n = 34). Most participants (76.3%, n = 29) had not received prior statistical training. Significant improvements were observed in overall biostatistics knowledge scores across all domains ($p = 0.001$), overall attitude scores ($p < 0.001$), and the perceived difficulty domain ($p = 0.006$).

Conclusion: The study indicates that hands-on biostatistics training improved postgraduate nursing students' knowledge and positively influenced their attitudes toward biostatistics. However, the findings are exploratory and context-specific and may be influenced by potential biases. Integrating such training into nursing curricula could enhance statistical literacy and support research participation and evidence-based practice. This will serve as a foundation for advancing the nursing discipline.

Keywords: Hands-On Training, Biostatistics, Knowledge, Attitude, Nursing Students.

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Introduction

In healthcare, biostatistics is essential for analyzing health-related research and is a key component of medical and nursing education. Active involvement in data analysis promotes profound comprehension of concepts, builds self-assurance and enhances critical thinking abilities. Healthcare practitioners often view statistics courses as highly challenging, mainly because they perceive the subject as complex and may lack a solid foundation in mathematics. [1-2]

For postgraduate nursing students, statistical literacy is crucial as it supports evidence-based nursing practice, enables informed clinical decision-making, and enhances the ability to critically evaluate research. Interactive sessions prepare students to address complex healthcare challenges effectively. Furthermore, it equips them with the skills to interpret data accurately and apply research findings effectively in clinical settings, thereby improving the quality and safety of patient care. Through hands-on training, statistical methods can be applied to real-world scenarios, enhancing decision-making and evidence-based practice. [3-4]

Previous studies showed that only 31.9% of medical trainees showed positive attitudes, while 26.5% demonstrated good knowledge of biostatistics and reported that knowledge and attitudes toward statistics were required for enhancing learning outcomes. In addition to this, previous meta-analysis showed that nursing students had reported a lack of knowledge with a pooled mean score=3.06 (95 % CI: 2.72, 3.39) but positive attitudes towards evidence-based nursing practice (EBP) with a pooled mean score= 3.57 (95 % CI: 3.28, 3.86). Nurses' perceptions and attitudes affect their ability to develop statistical reasoning and comprehend key concepts. Instruments such as the Survey of Attitudes Toward Statistics (SATS) have been validated to measure these attitudes at the University of Minnesota Rochester, highlighting the importance of addressing both cognitive and affective domains in statistical education [5-7]

There were a few already existing previous biostatistical interventions, mainly including structured training programs, hands-on workshops, SPSS-based practical sessions, and multimodal or online learning approaches. Although studies indicate that hands-on and software-based training improves knowledge retention, analytical skills, and attitudes toward biostatistics. Many still lack sufficient emphasis on sustained practical application and region-specific evaluation, highlighting the need for further studies. A few of the barriers reported in previous literatures such as lack of awareness (53%), interest (54%), funds (62%), time (59%), and difficulty in follow-up of patients (67%). With an increasing number of nurses and other healthcare professionals pursuing post-graduate level health science education, it is important to assess their attitudes toward statistics and identify effective strategies to improve them. Insufficient statistical knowledge may lead to ethical concerns, including misinterpretation of research findings and compromised evidence-based medical practice. [8-10]

There is limited literature on this topic among nursing students in tertiary care institutions in the Sub-Himalayan region; addressing this gap is essential to enhance statistical competence, research ethics, and critical thinking skills. Hence, the study was aimed at assessing and comparing the knowledge and attitude of biostatistics in nursing students before and after hands-on biostatistics training in a tertiary care institution in the Sub-Himalayan region.

Materials and Methods:

Research approach: A quantitative research approach was utilized for this study.

Research study design: A quasi-experimental study design (one-group pretest-post-test design) was employed for this study.

Study setting: Orange lecture theatre, College of Nursing, a tertiary care institution in Rishikesh, Sub-Himalayan Region.

Sample: The participants comprised postgraduate nursing students at a selected tertiary care teaching institution. Total enumerative sampling was employed to recruit, including all students attending the training, resulting in a sample size of 38 without any power analysis. Exclusion criteria included students unwilling to participate or unavailable during the study period.

Sample size: Total enumerative-38 postgraduate nursing students from the College of Nursing, Tertiary Care Institution, Rishikesh, were recruited for the study.

Participant recruitment: In this design, 38 participants were in one sample; their pretest was taken on day 1, and after training, a post-test was taken on day 2 for the same sample.

Intervention: Practical Biostatistics Training: -
A structured 16-hour hands-on training program was conducted for postgraduate nursing students at a tertiary care institution by biostatistics experts from the Departments of Nursing and Community & Family Medicine. Table.1 shows the intervention techniques used for biostatistical training among postgraduate nursing students. The intervention/training was organized into eight sessions conducted by 8 separate instructors /intervention providers/expert faculties, each lasting two hours, and included hands-on activities on software-SPSS following each session. The intervention developers acted as intervention providers of the hands-on training sessions. They held doctoral degrees or MD qualifications from the College of Nursing and the Department of Community and Family Medicine specialized in the field of biostatistics within the same institution, respectively, and some of them were already involved in teaching these students directly or indirectly. Students were clubbed together into small groups of 3-4, each guided by a mentor, with a lead faculty expert supporting the mentors. Hands-on training was emphasized, and students were instructed to bring laptops preloaded with a trial version of SPSS. Worksheets were provided to facilitate practice and reinforce learning during the sessions. Followed by practical sessions, post-assessment of knowledge and attitude scores were measured. Pre-test tools were filled by participants on day-1 in the morning, 9 am and post -test tools were filled on day-2 post-lunch.

The course employed diverse teaching tactics to reinforce content, incorporating student-preferred and effective methods for improving attitudes toward statistics, including PowerPoint presentations and active participation through team-based learning. Classroom dynamics emphasized mutual respect, interaction, and effective communication. Expectations, time management, and conflict resolution were established collaboratively, focusing on timely feedback and clear explanations of complex concepts. Despite unchanged objectives and content, this marked the first application of literature-informed teaching methods and power dynamics in the biostatistics course.

Outcome measures: pretest (day-1) and post-test (day-2) assessment of knowledge and attitude towards biostatistics

Data Collection Tools:
Socio-Demographic Datasheet: A self-structured datasheet, validated by five experts from the Departments of Nursing and Community & Family Medicine, was utilized. It comprised six items: age (in years), gender, and professional experience after "B.Sc. Nursing/Post Basic B.Sc. Nursing" (in months), year of postgraduate study, prior attendance at biostatistics training (yes/no), and, if applicable, details of the training.

Biostatistics Knowledge Questionnaire: A self-structured multiple-choice questionnaire include 25 items categorized into six domains, named sample size estimation (4 items), use of SPSS: Descriptive analysis (4 items), use of SPSS: Inferential statistics (4 items), interpreting metanalysis (4 items), qualitative analysis (4 items), risk index and basics of regression analysis (5 items). The total duration was 5-10 minutes to fill this questionnaire.

Tool Development Process and Content Validity

A self-structured knowledge multiple-choice questionnaire was developed based on an extensive literature review, and content validity was established through evaluation of expert input from the fields of nursing and community & family medicine. The initial pool of items was designed to cover key domains of biostatistics relevant to postgraduate nursing students. Their feedback was used to assess the relevance, clarity, and comprehensiveness of the items, and necessary modifications were incorporated accordingly.

Pilot Testing

The questionnaire was pilot tested on a small group of participants similar to the target population to assess clarity, feasibility, and time required for completion. Based on the pilot findings, minor revisions were made to improve understanding and structure. The average time required to complete the questionnaire was 5–10 minutes.

Reliability

The reliability of the tool was assessed using the test–retest method. The tool was administered on the same participants after a one-week duration, yielding a correlation coefficient (r) of 0.8, indicating good reliability.

Item Analysis (Difficulty and Discrimination Index)

Item analysis was conducted to evaluate the quality of individual questions. The difficulty index was calculated as 0.49 to determine the proportion of participants who answered each item correctly. The discrimination index came out as 0.70, which was also assessed to identify how well each item differentiated between high and low performers. Items with poor discrimination or extreme difficulty levels were reviewed and revised or removed.

"Survey of Attitudes Toward Statistics (SATS-36)" [11]: It is a validated and reliable standardized rating scale with 36 items categorized into six domains and four additional items. The reliability of this tool was established by the author Schau et al. with a Cronbach's Alpha of 0.8. The total range of scores for each domains from 1-6. SATS-36 scale measures "students' feelings and expression concerning statistics" (domain.1 "affect"-6 items), "student's attitudes about their intellectual knowledge and skills when applied to statistics" (domain.2 "cognitive competence"-6 items), "student's attitudes about the usefulness, relevance and worth of statistics in personal and professional life" (domain.3 "value"-9 items), "student's attitudes toward difficulty in understanding statistics as a subject" (domain.4 "difficulty"-7 items), "student's interest in learning and using statistics" (domain.5 "interest"-4 items), and "the amount of work the student expended to learn statistics" (domain.6 "effort"- 4items). The SATS-36 scale consists of 7-point Likert-type items, where responses/scoring range from 1 ("strongly disagree") to 7 ("strongly agree"), with 4 representing a "neutral" stance. Responses to negatively worded items (marked with an asterisk*) were reverse-coded (e.g., 1 becomes 7, 2 becomes 6). The item scores for each component were then summed and divided by the number of items in that component. On the 7-point scale, higher scores indicate more positive attitudes. To calculate the overall scale and subscale scores, the item responses are totalled and divided by the total number of items in each respective scale or subscale. The total duration was 5-10 minutes to fill this questionnaire.

Ethical approval: The ethical approval was received from the Institutional Ethical Committee, a tertiary care institution, India (Ref. No. AIIMS/IEC/24/532). Participants' informed consent about the study and its objectives was obtained before their enrollment. Confidentiality of participants' information was ensured by using anonymized, self-administered questionnaires without personal identifiers. Data were coded, securely stored, and accessed only by the research team, ensuring that individual responses could not be traced back to participants.

This study follows the Declaration of Helsinki as well as ICMR and good clinical practice guidelines. In this study, participation was voluntary, and the participation of students was not affected by academic evaluations.

Data Analysis: Data was coded into an MS Excel sheet and in "IBM SPSS Statistics" version 24.0 software. Data was evaluated using appropriate descriptive and inferential statistics where two tailed '*p'* values were considered significant ≤0.05. The "Shapiro-Wilk" test was used to assess the normality of the data ($p > 0.05$). For the pretest and post-test, the knowledge *p*-value was 0.10 & 0.52 similarly, the pretest-post-test attitude *p* value 0.86 & 0.10, respectively. Based on the normality test results, the "Wilcoxon Signed-Rank" test, a non-parametric method, was employed to analyze the continuous data for knowledge and attitude scores. All of the 38 participants attended the training and were included in the analysis.

Results

Baseline data: The mean age of the 38 students was 25.21 ± 3.54 years. Most participants were female (89.5%, n=34). An equal proportion of participants (50%, n=19) were enrolled from the first-year and second-year postgraduate batches. Most participants (76.3%, n=29) had not received prior statistics training before this training. The mean working experience among participants was 11.26 ± 39.92 years.

Outcome estimation:

Change in Biostatistics Knowledge Scores of the participants.

Table 1 demonstrates a significant improvement in overall knowledge scores of biostatistics in the post-test compared to the baseline ($p < 0.0001$*). All assessed domains showed statistically substantial enhancements, including sample size estimation ($p < 0.002$*), use of SPSS for descriptive analysis ($p < 0.0001$*), use of SPSS for inferential statistics ($p < 0.0001$*), interpretation of meta-analysis ($p < 0.0001$*), qualitative data analysis ($p < 0.0001$*), risk index calculation and basics of regression analysis ($p < 0.0001$*), and overall knowledge scores ($p < 0.0001$*). These findings indicate a substantial improvement in biostatistics knowledge among 38 postgraduate nursing students following the training.

Table 1. Sessions and Methods of Training

Instructor	Statistical topic in each session	Objectives	Methods used/ Software exercise
1	Significance of Statistics in Nursing Research	Students will be able • To enlist the importance of statistics in nursing • To describe the benefits of statistics in nursing research	• Group formulation and rapport establishment. • Introduction and briefing • Ice-breaking activity
2	Estimating Sample Sizes	Students will be able to learn different calculation techniques of estimating sample size for different study design	• Group activity • Individual calculation
3	Overview Statistical Software SPSS 24 (trial version)-Descriptive Statistical Analysis	Students will be able to • Navigate through the SPSS interface • Differentiate between Data View and Variable View in SPSS. • Explain about different steps for performing descriptive analysis • Summarize measures of central tendency and measures of dispersion	• Lecture method • Hands-on practice on software
4	Inferential Statistical Analysis using SPSS	Students will be able to • Enlist different steps for performing parametric analysis	• Didactic lecture cum discussion method

	Parametric and Non-parametric Tests	• Perform the parametric and non-Parametric Test	• Hands-on practice on software
5	Meta-Analysis Techniques and Interpretation - RevMan Software Hands-on Practice	Students will be able to • Describe about meta-analysis basic concept • Interpret about how to enter study data into RevMan software	
6	Qualitative Data Analysis	Students will be able to • Describe the qualitative study and its type • Interpret different software used for its analysis	• Didactic lecture • Group activity • Case scenario-based discussion
7	Applications of SPSS Calculating Risk Indices	Students will be able to • Enlist different risk indexes used in the medical field • Calculate risk indices in SPSS software	• Didactic lecture • Individual calculation • Hands-on practice on software
8	Fundamentals of Correlation and Regression Analysis	Students will be able • Summarize about the fundamentals of regression analysis and its type • Compute regression analysis	• Lecture method • Hands-on practice on software

Change in Attitude toward Statistics

Table 2 revealed a significant improvement in the overall attitude towards biostatistics in the post-test scores compared to the baseline scores, p <0.001*. However, a few domains of attitude tools reported a significant improvement, which includes difficulty ($p < 0.001$) and overall attitude scores ($p < 0.006$). Although no significant difference was found in other attitude domains, including "affect" ($p = 0.06$), "cognitive competence" ($p = 0.07$), "value" ($p = 0.06$), "interest" ($p = 0.84$), and "effort" ($p = 0.80$). Hence, after attending the training among 38 postgraduate nursing students, this table implies a significant improvement in "attitude", with a few domains of biostatistics as tricky and in statistical and cognitive competence.

Table 2 ***Comparison of Biostatistics Knowledge and Attitude Scores among Participants (N=38)***

S. N	Knowledge Domains	Pre-test Median (IQR)	Post-test Median (IQR)	Z value (p-value)	Effect size 'r'	Lower 95% CI	Upper 95% CI
1	Sample size estimation	1 (1-1.5)	3 (0-3.5)	-3.09 (0.002*)	0.50*	0.27	-1.47
2	Descriptive analysis using SPSS	2 (1-2)	2.5 (2-4)	-3.74 (0.0001*)	0.61*	0.19	-1.35
3	Inferential statistics using SPSS	2 (1-2)	3 (2-4)	-4.38 (0.0001*)	0.71*	0.21	-1.17
4	Interpreting the Meta-analysis	2 (1-2)	3.5 (2-4)	-4.2 (0.0001*)	0.68*	0.22	-1.77
5	Qualitative analysis	3 (2-3)	4 (2-4)	-2.29(0.0001*)	0.37	0.17	-076
6	Basics of Correlation and Regression Analysis	2 (1-3)	2 (1-3)	-4.35(0.0001*)	0.71*	0.22	-0.59
7	Overall Score	11 (9-13)	16 (12-20.25)	-4.33 (0.0001*)	0.70*	0.84	-9.73
	Attitude Domains						
1	Affect	25 (21.75-30)	26 (23.75-34.25)	-1.87 (0.06)	0.30	1.06	-4.35
2	Cognitive competence	25 (22.75-30.25)	28 (24-32)	-1.79 (0.07)	0.29	1.01	-3.82
3	Value	42.5 (37-49.25)	46.5 (39.25-50)	-1.8 (0.06)	0.29	1.34	-4.91

4	Difficulty	21.5 (14.75-24.25)	24 (20.75-28)	-3.24 (0.001*)	0.53*	0.89	-5.10
5	Interest	23 (19.75-26)	23.5 (20-26.25)	-0.197 (0.84)	0.03	1.03	-2.18
6	Effort	24.5 (22.75-27)	25 (20-28)	-0.24 (0.80)	0.04	0.83	-1.12
7	Overall Score	162.5 (146.5-177)	173 (153.75-191.25)	-2.77(0.006*)	0.45*	4.29	-17.64

Note: *Wilcoxon Sign Rank Test-Z value, *p-value ≤0.05 considered as significant, CI-confidence interval, *- effect size representing medium to large.*

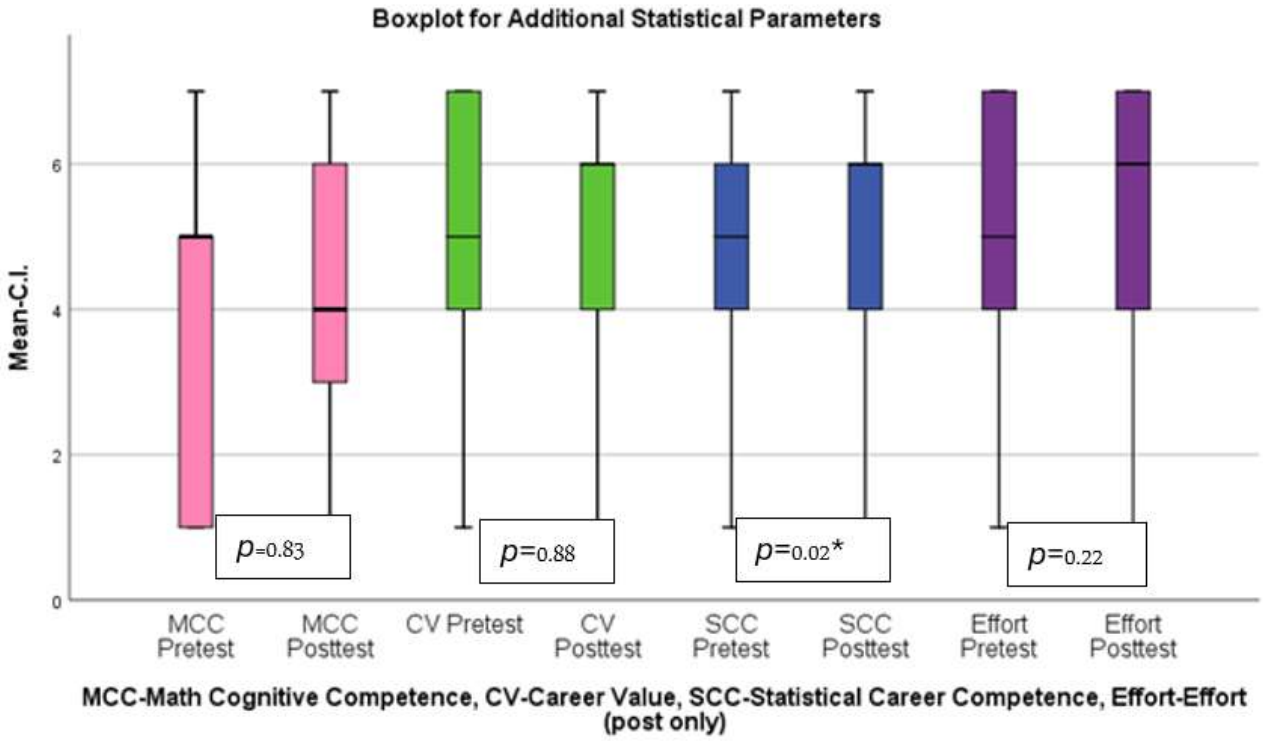

Figure 1 shows a box plot for additional statistical parameters, which contained four additional items from the SATS tool: "career value", "math cognitive competence", "effort" (post-test only), and "statistical cognitive competence". There was a significant post-test improvement in attitudes toward the career value of biostatistics, while no significant changes were detected in attitudes toward the other remaining items.

Relationship between knowledge and attitudes of the participants

Table 3 demonstrated the absence of evidence for correlation between pre-test knowledge scores and attitude towards biostatistics among postgraduate nursing students (p>0.05). Similarly, the absence of evidence for correlation was found between post-test knowledge scores and attitude towards biostatistics (p>0.05). Hence, the knowledge and attitudes towards biostatistics showed no correlation before and after attending the training among postgraduate nursing students.

Table 3 *Correlation between Participants' Knowledge and Attitudes toward Statistics (N=38)*			
S.N	**Variable**	**Pre-test knowledge score r (*p*-value)**	**Post-test Knowledge score r (*p*-value)**
1	Pre-test Attitude score	0.05(0.73)	-
2	Post-test Attitude score	-	-0.03(0.81)
r=Spearman's Rank correlation coefficient, p value ≤0.05 considered as significant.			

Discussion

The present study assessed the effect of hands-on biostatistics training on postgraduate nursing students' knowledge and attitude scores. The results showed a marked improvement in biostatistical knowledge and attitude toward biostatistics among postgraduate nursing students.

Similarly, a previous study conducted in South Africa assessed the "impact of a short biostatistics course on the knowledge and performance of statistical analysis" among biomedical researchers in Africa, recognizing the critical role of biostatistics in understanding scientific literature and participating in global research. Pre- and post-course evaluations using quantitative questionnaires demonstrated significant improvement in participants' statistical knowledge and performance, as evidenced by a median score increase from 0 to 28.5% post-course. The findings highlight inadequate baseline biostatistics knowledge among African scholars and the effectiveness of short courses in enhancing research skills, supporting the present study findings. [12]

In alignment with the present study findings, a recent study investigated the effectiveness of a "10-day short-course training on STATA for healthcare eye professionals" to enhance data management and analysis competency. Pre- and post-test evaluations revealed a statistically significant improvement in participants' median scores from 43 to 72.5. [13]

Similarly, another study conducted in a dental institution in Bengaluru aimed to "evaluate the knowledge, attitude, and perception regarding biostatistics among faculty and postgraduate students." A cross-sectional survey using a 20-item questionnaire assessed knowledge, attitude, and perception domains. Results showed that doctoral students had better biostatistics knowledge than staff members. [14]

Another study assessed improvement in first-year postgraduate students' knowledge of research methodology through pre- and post-test evaluations during training. The results demonstrated a significant increase in awareness, with mean scores rising from 3.32 to 10.53. Participants rated the sessions positively, which is consistent with the present study findings. [15]

Additionally, literature on the "effect of a biostatistics course among undergraduate nursing students" reported that positive responses increased substantially after training, reaching above 95% across domains such as sampling, data summarization, central tendency, and variability. Improved responses regarding the use of statistical software were also noted, supporting the present findings. [16]

Similarly, a study on "nursing students' attitudes toward statistics: Effect of a biostatistics course and association with examination performance" reported significantly higher post-test scores on the SATS-36 scale, including affect, cognitive competence, interest, and effort. Although improvements were weakly correlated with exam performance, hands-on training enhanced knowledge and attitudes toward statistics. Overall score for biostatistics attitude on SATS -36 scale improved from pretest score=4.24 (3.76–4.75) to post-test score=4.54 (4.15–4.98), with p=0.001, supporting the recommendation for comprehensive training programs, which was in line with the current study findings. [17]

Another study entitled "Knowledge, attitude, practice, and barriers toward research among medical students: A cross-sectional questionnaire-based survey." Results indicated 70% of knowledge regarding the concept of research and methodology, with an expressed positive attitude toward involvement in research activity. Attitude was also linked to age and proficiency in statistical software, supporting the present findings and emphasizing the need for integrating biostatistics education into curricula. [9]

Supporting the present study findings, another study conducted using the SATS-36 tool demonstrated significant differences between pre- and post-test attitude scores across multiple domains among faculty of science and management. The study results showed statistically significant differences (p-value < 0.05) between the post-test and the pre-test scores in the Faculty of Science for cognitive competence and effort, at a 95% confidence level. [18]

In contrast to the present study, which found no evidence of a correlation between knowledge and attitude, a study on the "impact of Basic Course in Biomedical Research (BCBR) on medical teachers and postgraduate students across India" reported that the study proved a strong association between pre-course and post-course performance across different research topics. The majority scored over 70% in the course, indicating substantial knowledge improvement. [19]

Another study aimed at "determining biostatistics knowledge of students and physicians in medical school" found that residents, who are involved in the research, gain an increment in both knowledge of general statistics and tests such as non-parametric statistics and sampling techniques. The study also highlighted the importance of early integration of biostatistics education. [20] Similarly, another previous study's results showed students' positive responses to having basic biostatistics knowledge were 68.0% before training and 95.7% after training. [21] In addition to this, previous meta-analysis showed that nursing students had reported a lack of knowledge with a pooled mean score=3.06 (95 % CI: 2.72, 3.39) but positive attitudes towards evidence-based nursing practice (EBP) with a pooled mean score= 3.57 (95 % CI: 3.28, 3.86).; all these findings were in support to the present study findings.[6]

Overall, the present study demonstrated improvement in biostatistical knowledge and attitude among participants, highlighting the effectiveness of experiential learning strategies. These findings are consistent with existing literature suggesting that interactive, application-based teaching methods are more effective than traditional approaches in promoting statistical literacy. However, the identification of a challenging domain indicates the need for further refinement of the curriculum. A positive attitude toward biostatistics may enhance engagement and confidence in applying statistical concepts in professional practice.

Strengths: The present study results showed the effectiveness of the intervention for being a quasi-experimental design rather than a descriptive observational research design. Data regarding biostatistical attitude were collected by using a validated standardized tool. Data were obtained by all participants from both courses by using total enumerative sampling techniques. The intervention was reported as per educational intervention reporting standards.

Limitations: A quasi-experimental design restricts the ability to definitively establish causality due to the lack of a control group. Several biases, such as testing effect, maturation effect and exposure to external learning resources, could affect the study results in this study design. Future research could employ an experimental design to provide more substantial evidence for the impact of such interventions. Total enumerative sampling was recruited in this study without any sample size calculation or power analysis, which may introduce selection bias. In this study, data were collected from nursing students at a tertiary care institution which was situated in the Sub-Himalayan region, and the study results were exploratory and context-specific. Moreover, there is an absence of longitudinal follow-ups for evaluating the long-term retention of knowledge and attitudes regarding biostatistics in this study. A few limitations, such as small

sample size, short follow-up period and self-reported attitude measures, may affect the present study findings.

Higher education Implications: Nursing professionals can be pivotal in advancing healthcare quality and accessibility in the Sub-Himalayan region and beyond. Hands-on biostatistics training strengthens competencies among MSc Nursing students and PhD scholars by enhancing research skills, critical appraisal, and evidence-based practice. It equips nurse researchers to design studies, analyze data, and address healthcare challenges, particularly in resource-limited settings. Additionally, it supports nurse educators in effectively mentoring students and fostering a research-oriented academic environment.

Conclusion

Biostatistical knowledge and attitude are essential for advancing evidence-based nursing practice, enabling nurses to analyze data critically, apply research findings, and make informed clinical decisions. Our study highlights that short, hands-on training sessions statistically improved postgraduate nursing students' knowledge and attitudes towards biostatistics. The study results were exploratory and context-specific. Such training equips students with hands-on training to engage with biostatistical concepts, conduct research, and incorporate evidence-based practices into their professional roles. Although the study has some limitations, such as potential biases in the study design, a small sample size, a short follow-up period, and the use of self-reported attitude measures, these factors may have influenced the findings and limited their generalizability.

The researcher recommended that including biostatistics training in postgraduate nursing curricula, as recommended by the Indian Nursing Council (INC), is crucial. This step fulfils regulatory requirements and fosters a culture of research and innovation among India's future nurse researchers. By embedding biostatistical competencies early in their education, nursing professionals will be better prepared to address the complexities of modern health care, contribute to high-quality research, and support data-driven decision-making. Furthermore, this initiative can have a transformative impact on the nursing profession in India. Thus, the researcher recommends that this biostatistical training in nursing education is a vital step toward building a robust foundation for evidence-based nursing and strengthening the role of nurses in India's healthcare system. This will serve as a foundation for advancing the nursing discipline.

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