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A Comparative Study to Assess the Effectiveness of Book-Based Search Methods versus Mobile-Based Search Methods among the Nursing Students in a Selected Nursing College, Mumbai

Pranali Alave[1], Sneha Raje[2], Riya Kaur Gill[3]

[1, 2]Holy Spirit Institute of Nursing Education, Mumbai, Maharashtra, India

[3]Guide, Holy Spirit Institute of Nursing Education, Mumbai, Maharashtra, India

Abstract: ***Background: In healthcare, nursing students require accurate, up-to-date information for both academic learning and clinical decision-making. Traditionally, textbooks and journals have served as reliable, peer-reviewed sources of knowledge. However, with the advent of smart phones and mobile technology, information retrieval has become faster and more convenient through search engines, mobile applications, and digital libraries. Mobile searches are particularly valuable in clinical settings, offering quick access to current research and treatment guidelines, thereby enhancing clinical decision-making. The shift from traditional book-based methods to mobile-based search tools has significantly transformed nursing education. While textbooks provide dependable and well-established information, mobile devices offer greater speed, accessibility, and real-time updates, which are especially beneficial in dynamic clinical and academic environments. Moreover, mobile search methods have proven superior in terms of knowledge retention, aligning with the increasing reliance on technology in healthcare education. This study was conducted to compare the effectiveness of book-based versus mobile-based search methods among nursing students. Methods: A non-experimental, comparative study design was adopted involving 71 B.Sc. Nursing students selected using non-probability convenience sampling. Students were divided into two groups—one using traditional textbooks and the other using mobile-based search methods to retrieve academic content. Pre-test and post-test knowledge scores were measured using a structured questionnaire. Data were analysed using descriptive and inferential statistics, specifically the unpaired t-test to determine the differences observed between the groups. Results: The pre-test knowledge score for the mobile group was 71.25%, and for the book-based group, 70%. Post-test scores showed improvement: 78.19% for the mobile-based group and 74.6% for the book-based group. The t-value was 5.20, which exceeded the tabulated value (1.66) at $p \leq 0.05$, indicating a statistically significant difference favouring mobile-based methods. These findings underscore the importance of integrating mobile technology into nursing education to enhance learning outcomes and support an evidence-based clinical practice.***

Keywords: Book-based, Mobile-based, nursing students, Digital learning, Educational methods

1. Introduction

The rapid evolution of digital technology has fundamentally reshaped nursing education. Traditionally, students depended on textbooks and library resources a time consuming and limited process. Today, mobile devices and tablets offer instant access to multimedia content, diagnostic apps, and collaborative tools that enhance motivation, confidence, clinical reasoning, and communication skills. A meta-analysis of clinical nursing education demonstrated that mobile learning led to significantly greater improvements in skills (SMD = 1.22), knowledge (SMD = 0.43), satisfaction, and confidence compared to conventional methods

The COVID-19 pandemic served as a significant catalyst, forcing a swift pivot to online and blended instruction. Studies among nursing students and recent graduates highlighted both opportunities such as flexible, self-paced learning and virtual peer groups and challenges, including technological issues, increased stress, social isolation, and difficulties simulating clinical experience. Still, e-learning strategies like small-group, active feedback and interaction and scaffolding proved valuable in preparing students for healthcare roles.

Digital literacy specifically digital health literacy has emerged as a critical competency. Evidence from diverse settings indicates a moderate proficiency level, with only about 44% of students demonstrating high digital health literacy. A cross-sectional study in Iran reported moderate scores (mean ≈ 47/100), with operational skills strong but privacy protection weak. This signals a need to embed targeted training on information evaluation, ethics, and data privacy throughout curricula.

Artificial intelligence is also gaining attention in nursing education. A scoping review found that integrating AI tools enhances personalized learning, problem-solving, and decision-making. However, effective outcomes depend heavily on digital literacy and academic support. Meanwhile, a separate review focusing on English-for-nursing instruction revealed progressive shifts from basic digital tools to advanced AI demonstrating improved communication practice but also technological and pedagogical challenges

2. Need of the Study

The necessity of this study lies in understanding how students navigate book-based versus mobile-based search methods, enabling educators to blend traditional and modern learning strategies effectively. Research consistently demonstrates that reading from printed materials fosters deeper comprehension and better retention, largely due to spatial and tactile cues. One meta-analysis found comprehension to be six to eight times higher with physical books compared to

screens, while neuroscience studies confirm stronger brain activation and sensory engagement during paper reading. These findings emphasize the cognitive benefits of engaging with printed materials, particularly in terms of focus, memory recall, and attention span.

Conversely, mobile-based learning excels in accessibility and interactivity. It offers significant advantages such as portability, multimedia content, and instant access to vast and updated resources features that enhance motivation and convenience, especially in remote or time-sensitive contexts. Moreover, the ability to quickly cross-reference topics and access current guidelines allows students to make informed decisions in real-time, especially during clinical placements. However, digital reading can also foster distractions, multitasking, and an illusion of understanding, often leading to shallower processing of information. Importantly, studies show that digital fluency can improve with proper training, suggesting that overconfidence and low met cognitive awareness not an inherent inferiority of digital media are major factors that typically undermine digital comprehension.

Understanding these dynamics enables educators to design effective blended learning environments that harness the deep cognitive engagement supported by print alongside the speed and flexibility of digital tools. Such a balanced approach, underpinned by focused digital literacy training and continued access to printed texts, offers an inclusive learning framework that respects diverse preferences, learning styles, and academic needs. When guided by evidence-based curriculum planning, by strategically integrating both modalities, educators can better equip students for success in academic and clinical environments. Ultimately, this dual-method strategy not only maximizes educational outcomes but also supports adaptive, lifelong learning in an evolving digital age.

Aim of the study

To assess the pre-test and post-test knowledge regarding effectiveness of Book-based search methods, to assess the pre-test and post-test knowledge regarding effectiveness of Mobile based search methods, to compare the effectiveness of Book-based search methods and Mobile based search methods in terms of knowledge among nursing students.

Objectives

The objectives of this study were to assess the knowledge gained through book-based search methods, to assess the knowledge gained through mobile-based search methods, and to compare the effectiveness of these two approaches among nursing students. Employing a non-experimental, comparative research design, the study focused on B.Sc. Nursing students in their 3rd, 4th, and 5th semesters. A total of 71 students were selected using a non-probability convenience sampling technique. The intervention involved two groups: Group A used book-based methods and Group B used mobile-based methods to search for academic content within a fixed period. Knowledge was evaluated using a structured questionnaire validated by subject experts. Data were analysed using descriptive statistics and unpaired t-tests via SPSS to determine and compare the effectiveness of each search method on students' knowledge acquisition

Reliability: Reliability is done by Karl Pearson Correlation Coefficient formula and the score Obtained was 1 which is reliable.

Pilot study: Pilot study was conducted on 12 participants to assess the feasibility and clarity of the data collection tool. The participants were the batch of 1st P.B.B.s.c (N).

3. Results

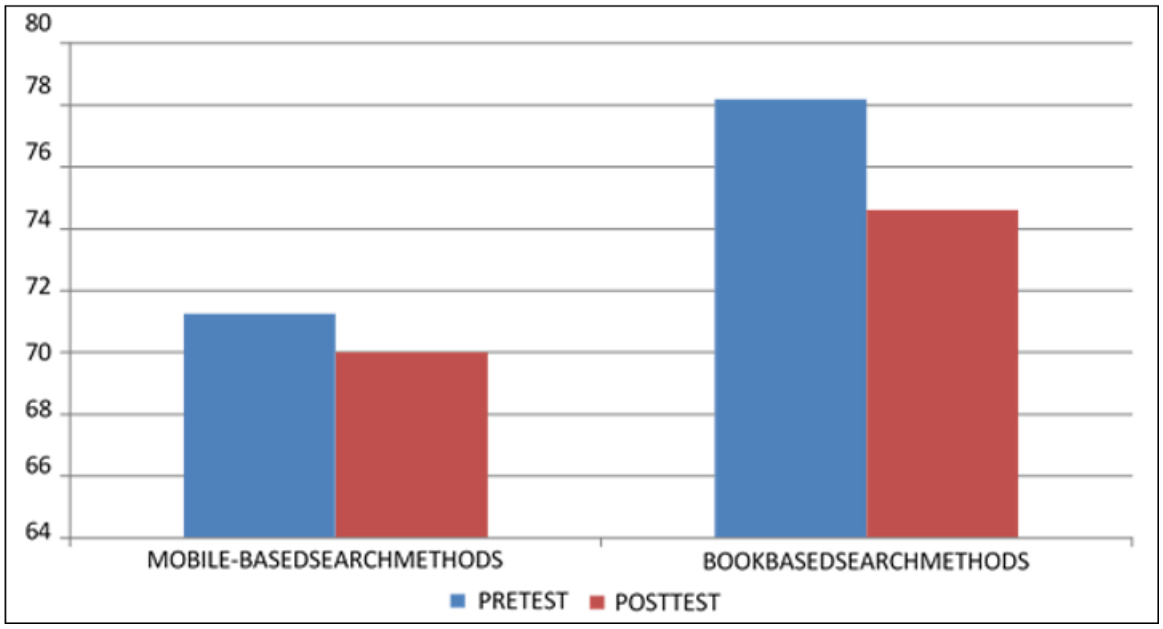

Figure 1: Post Test Knowledge Scores of Main Study

Inference:
The above figure shows that the pre-test knowledge of Mobile-based search methods is 71.25% and Book-based search methods is 70% and after providing the learning modalities the knowledge has been increased to 78.19% in Mobile-based search methods and 74.6% in Book-based search methods.

Section IV: A Comparative Study to Assess the Effectiveness of Book-based search methods versus Mobile-based search methods among the nursing students in a selected nursing college, Mumbai.

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Table 1: Post Test Knowledge Scores and Statistical Comparison (Book –Based and Mobile- Based Methods Groups)

Knowledge Score		Mean	Standard Deviation	Standard Error	't' Calculated	't' Table Value	'p' Value
Post Test	Book	15.63	1.58	0.381	5.20	1.66	0.05
	Mobile	13.65	1.63				

4. Discussion

This chapter presents a summary of the study and its significant findings. It also includes implications and recommendations based on the research objectives. The primary objectives of the study were: to assess the effectiveness of book-based search methods among nursing students; to assess the effectiveness of mobile-based search methods among nursing students; and to compare student learning outcomes between book-based and mobile-based search methods.

The findings of the study demonstrated a clear increase in knowledge levels among students in both groups. Among students using mobile-based search methods, 21.81% had knowledge in the pre-test, with a 78.19% increase observed in the post-test. In comparison, students using book-based search methods showed 31.72% knowledge in the pre-test, with a 68.28% increase in the post-test. The unpaired t-test was used to compare the effectiveness of both methods. The calculated t-value was 5.20, which was greater than the tabulated value of 1.66 at the 0.05 level of significance. This statistical result confirms a significant difference between the methods, thus rejecting the null hypothesis.

Major findings related to demographic variables are also noteworthy. A total of 71 nursing students were included through non-probability convenience sampling. The majority of participants were 18–20 years old (62 students), followed by 35 students aged 21–23 years, and 3 students aged 24 years and above. Regarding their academic level, 39% were in the 5th semester, 37% were in the 3rd semester, and 24% were in the 4th semester of B.Sc. Nursing. Preferred learning styles revealed that 50.70% benefited from reading and writing, 43.66% from visual learning, and 6% from kinaesthetic learning. In terms of their preferred study mode, 11.26% selected books, 22.53% preferred using mobile devices, and 66.19% indicated a preference for both methods. These findings highlight the diverse approaches students use for learning and underscore the importance of integrating both traditional and modern methods in nursing education

5. Conclusion

A comparative study conducted at the Holy Spirit Institute of Nursing Education demonstrated that mobile-based search methods significantly outperformed traditional book-based methods in enhancing student learning outcomes. This aligns with global evidence showing that smart phone enabled mobile learning effectively boosts nursing students' knowledge, skills, and confidence, as well as their overall attitudes towards learning. Multiple controlled studies have documented that mobile digital education, in both nursing and broader healthcare contexts, consistently equals or surpasses conventional teaching approaches in fostering cognitive and practical competencies. For instance, students using dedicated nursing skills mobile applications achieved higher knowledge scores, stronger self-efficacy, and better clinical performance than peers studying with static, non-interactive materials. These findings underscore that mobile-based searching offers greater engagement, flexibility, and real-time access to information attributes that are well-matched to the fast-paced and evolving nature of modern nursing education. Collectively, this evidence confirms that adopting mobile-based methods not only enhances learning effectiveness but also meets the demands of today's learners in a dynamic healthcare environment.

Ethical Considerations
- Ethical clearance obtained from Institutional Ethics Committee
- Informed consent collected from participants
- Anonymity and confidentiality maintained

Conflict of Interest None declared.

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Author Contributions
- Riya Kaur Gill (Guide): Research design, supervision, manuscript review
- Authors (students): Data collection, analysis, draft preparation

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