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Research Article

Impact of Information and Communication Technology on Library and Information Services in Nursing Colleges of the Malwa Region

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ABSTRACT

The present study examined the impact of Information and Communication Technology (ICT) on library and information services in nursing colleges of the Malwa region. A descriptive survey method was adopted to collect primary data from faculty members, research scholars, postgraduate students, and undergraduate students across 20 nursing colleges. A total of 942 questionnaires were distributed, out of which 800 valid responses were received and analyzed. The study focused on the availability and use of ICT tools and devices in academic libraries. The findings revealed that ICT tools such as laptops, pen drives, and CD-ROMs were frequently used by a majority of respondents, indicating their importance in academic and learning activities. However, several ICT facilities, including scanners, smart cards, fax machines, and tablet devices, were either rarely used or not used at all by a significant proportion of respondents. The analysis further indicated that more than one-fourth of the respondents did not actively use ICT tools, highlighting issues related to lack of awareness, inadequate training, or limited access. The study concluded that although ICT had made a noticeable impact on library services in nursing colleges, its effective utilization remained uneven. The results emphasized the need for improved ICT infrastructure, regular user orientation programs, and digital literacy initiatives to enhance the effectiveness of ICT-based library services in nursing education.

Keywords: Diabetes prediction; Ensemble learning; Multimodal data; Machine learning; Early diagnosis; Healthcare analytics

1. Introduction

The rapid advancement of Information and Communication Technology (ICT) has significantly transformed the functioning, scope, and delivery of library and information services across the world. In the contemporary knowledge-driven society, libraries are no longer confined to physical spaces or traditional print collections; instead, they have evolved into hybrid and digital knowledge centers that rely heavily on ICT tools for efficient information acquisition, organization, storage, retrieval, and dissemination. This transformation is particularly crucial in academic and professional institutions, where timely access to authentic and updated information is essential for education, research, and evidence-based practice [1].

In the context of higher education, nursing colleges represent a specialized domain where access to current clinical guidelines, research articles, e-journals, databases, and digital learning resources plays a vital role in improving academic outcomes and professional competence. The integration of ICT in library and information services enables nursing students and faculty to access global health information resources, online medical databases, digital repositories, and learning management systems, thereby supporting teaching–learning processes and research activities more effectively [2]. Technologies such as integrated library management systems (ILMS), online public access catalogs (OPAC), institutional repositories, digital libraries, e-resources, and web-based information services have become indispensable components of modern nursing college libraries [3].

In developing regions, including many parts of India, the adoption of ICT in academic libraries has gained momentum due to national digital initiatives, increased internet penetration, and policy-level emphasis on technology-enabled education. However, the level of ICT implementation, infrastructure availability, user awareness, and staff competency vary significantly across institutions and regions [4]. Nursing colleges, particularly in semi-urban and rural regions, often face challenges such as limited funding, inadequate technical infrastructure, lack of trained library professionals, and low digital literacy among users, which can hinder the effective utilization of ICT-based library services [5].

The Malwa region of Madhya Pradesh is an important educational zone with a growing number of nursing colleges catering to healthcare education needs. Despite this growth, there is limited empirical research assessing the actual impact of ICT on library and information services in nursing colleges of this region. Understanding how ICT tools are being adopted, the extent to which they enhance information access and service quality, and the challenges faced by libraries and users is essential for planning future improvements and policy interventions [6].

Against this background, the present study aims to examine the impact of ICT on library and information services in nursing colleges of the Malwa region. The study focuses on evaluating ICT infrastructure, digital resources, library services, user satisfaction, and the role of ICT in supporting academic and clinical learning. The findings are expected to provide valuable insights for library professionals, academic administrators, and policymakers to strengthen ICT-enabled library services in nursing education institutions.

2. Literature Review

The role of Information and Communication Technology (ICT) in library and information services has been widely discussed in library and information science literature, particularly in the context of academic and professional education. Researchers have consistently highlighted that ICT has transformed libraries from passive repositories of printed materials into dynamic knowledge centers offering user-oriented, technology-driven services.

Several studies have emphasized that ICT adoption improves the efficiency and effectiveness of library operations. Breeding [7] observed that automation of library functions through Integrated Library Management Systems (ILMS) significantly reduces manual workload, enhances accuracy in cataloguing and circulation, and improves overall service delivery. Similarly, Tiwari and Mishra [8] reported that the use of OPAC, digital databases, and electronic document delivery systems has improved accessibility and user satisfaction in academic libraries.

In the healthcare and nursing education sector, the importance of ICT-enabled library services is even more pronounced. According to Mishra and Panda [9], nursing students rely heavily on electronic journals, online clinical databases, and digital reference tools for evidence-based learning and research. Their study found that ICT-based resources contribute to better academic performance and improved clinical decision-making skills among nursing students. Supporting this, Bhardwaj and Walia [10] noted that access to online medical databases such as PubMed, CINAHL, and Medline through institutional libraries plays a crucial role in strengthening nursing education and research quality.

Studies conducted in the Indian context reveal uneven adoption of ICT across academic libraries. Thanuskodi [11] highlighted that while urban institutions have successfully implemented digital library services, many semi-urban and rural colleges still struggle with limited infrastructure, insufficient funding, and lack of trained library professionals. A similar observation was made by Kumar and Singh [12], who found that inadequate internet bandwidth and limited awareness among users significantly affect the utilization of ICT-based services in professional college libraries.

User perception and satisfaction with ICT-enabled library services have also been explored extensively. A study by Islam and Habiba [13] revealed that users generally show a positive attitude toward ICT applications in libraries, especially for quick information retrieval and remote access. However, the study also emphasized the need for regular user orientation programs to enhance digital literacy and

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effective resource utilization. In nursing colleges, where students often come from diverse educational backgrounds, such training becomes particularly important.

Focusing on regional studies, Sharma and Jain [14] examined ICT infrastructure in college libraries of Madhya Pradesh and reported moderate levels of automation and digital resource availability. Their findings indicated that although basic ICT tools are present in most institutions, advanced services such as institutional repositories, remote access systems, and digital reference services are still underdeveloped. This gap is more evident in specialized institutions such as nursing colleges, where library development often receives less priority compared to core academic infrastructure.

Despite the growing body of literature on ICT in academic libraries, there is a noticeable lack of focused studies on nursing college libraries at the regional level, particularly in the Malwa region. Most existing studies are either national-level surveys or concentrate on universities and general degree colleges. Therefore, a systematic assessment of the impact of ICT on library and information services in nursing colleges of the Malwa region is necessary to bridge this research gap and to provide region-specific insights for policy formulation and library development planning.

3. Research Methodolgy

The present study adopted a descriptive survey research design to examine the impact of Information and Communication Technology (ICT) on library and information services in nursing colleges of the Malwa region. The survey method was considered appropriate as it enabled the collection of primary data from a large number of respondents representing different academic categories within nursing institutions.

3.1 Area of the Study

The study was conducted in 20 selected nursing colleges located in the Malwa region of Madhya Pradesh. These colleges were chosen to represent institutions operating in urban, semi-urban, and rural settings, ensuring a balanced regional perspective on the availability and use of ICT-based library services.

3.2 Population and Sample

The population of the study consisted of faculty members, research scholars, postgraduate students, and undergraduate students of nursing colleges. A stratified sampling technique was used to select respondents from each category in order to ensure proportional representation.

A total of 942 questionnaires were distributed, out of which 800 completed questionnaires were received and found suitable for analysis. The remaining questionnaires were rejected due to incomplete or inconsistent responses.

3.3 Distribution of Respondents

Table 1 Respondents Statement

Category	Questionnaire distributed	Questionnaire selected for strictly	Percentage
Faculty	105	100 (5 x 20 = 100)	12.50
Research scholars	102	100 (5 x 20 = 100)	12.50
P.G. students	210	200 (10 x 20 = 200)	25
U.G. students	425	400 (20 x 20 = 400)	5
Total	942	800	100

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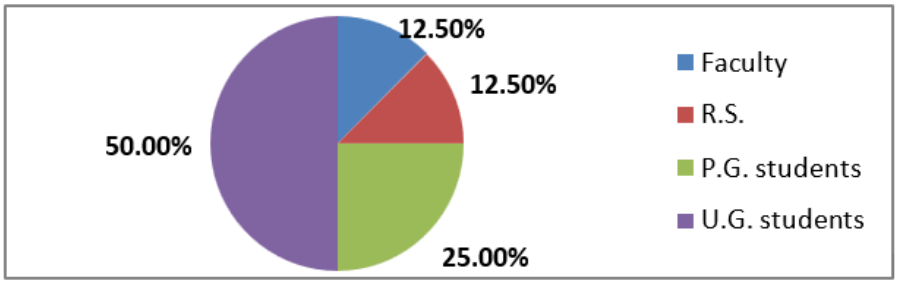

Fig. 1 Respondent distribution

From each of the 20 nursing colleges, respondents were selected as follows as shown in Table 1 and Fig. 1: Faculty members: 5 from each college (5 × 20 = 100), Research scholars: 5 from each college (5 × 20 = 100), Postgraduate students: 10 from each college (10 × 20 = 200), Undergraduate students: 20 from each college (20 × 20 = 400). Thus, the total sample size comprised 800 respondents, as shown in Table 1. This distribution ensured adequate participation from students, who constituted the major user group of library services, while also incorporating the perspectives of faculty members and research scholars.

4. Results and Discussion

The analysis of data collected from 800 respondents across nursing colleges of the Malwa region revealed significant variations in the use of ICT tools and devices in academic libraries. The findings are discussed below with reference to Table 2 and the corresponding figures.

4.1 Use of ICT Tools and Devices

Table 2 presented the frequency of use of various ICT tools and devices by the respondents. The results indicated that 34.90% of ICT tools were used frequently, 20.83% were used rarely, and 17.79% were used occasionally. However, a considerable proportion of responses (26.43%) fell under the "not responded" category, indicating limited exposure, lack of access, or inadequate awareness regarding certain ICT facilities. The overall usage pattern suggested that while some ICT tools were well integrated into academic and library activities, several tools remained underutilized in nursing college libraries of the region.

4.2 Frequently Used ICT Tools

Among all ICT tools as shown in Table 2, laptops emerged as the most frequently used device, with 77.75% of respondents reporting regular usage. This high percentage reflected the growing dependence of students and faculty on portable computing devices for accessing digital learning resources, e-journals, and online academic content.

Table 2 ICT tools used

ICT Tools & Devices	Respondents				
	Frequently % / *Number*	Rarely % / *Number*	Occasionally % / *Number*	Not Responded % / *Number*	Total
CD-ROM	56.87 455	28.12 225	11.25 90	3.75 30	800
DVD	37.25 298	35.62 285	18.75 150	8.38 67	800
Printer	24.37 195	26.87 215	35.63 285	13.13 105	800
Scanner	9.75 78	16.50 132	32.25 258	41.50 332	800

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Smart Card	7.75 62	12.25 98	14.00 112	66.00 528	800
Laptop	77.75 622	8.12 65	12.75 102	1.38 11	800
Fax	24.75 198	15.37 123	13.75 110	46.13 369	800
Pen-drive	61.87 495	22.50 180	11.13 89	4.50 36	800
9. I-Pad	13.75 110	22.50 180	10.62 85	52.13 425	800
	2513 34.90	1503 20.83	1281 17.79	1903 26.43	7200 100

Similarly, pen drives (61.87%) and CD-ROMs (56.87%) were also frequently used. The continued use of CD-ROMs indicated that many nursing libraries still relied on offline digital resources, particularly for reference materials, archival data, and institutional content where internet connectivity might have been inconsistent.

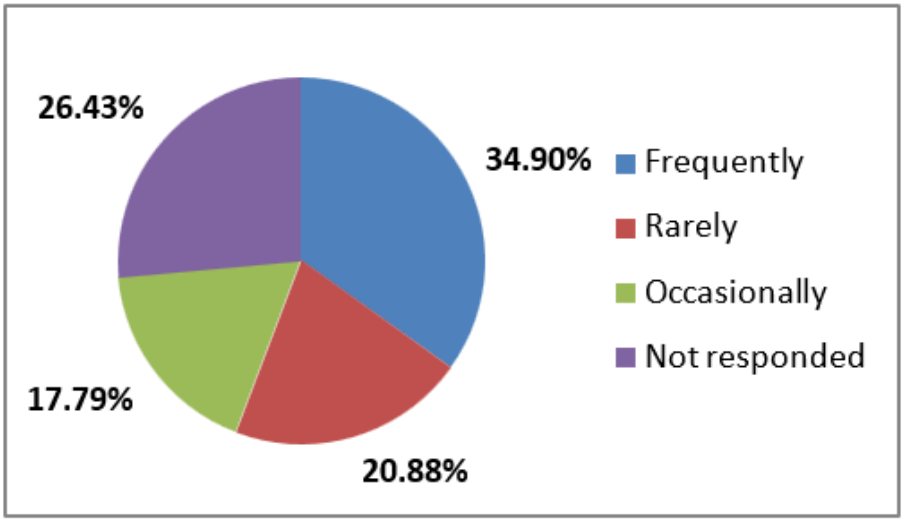

Fig. 2 Graphical representation of frequent and occassional usage of ICT tools

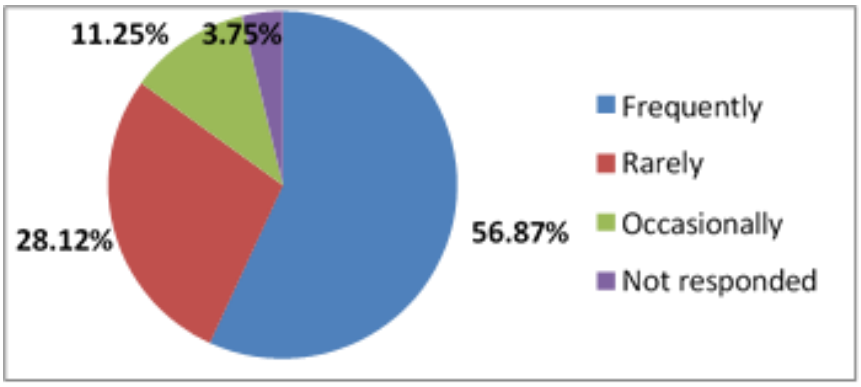

Fig. 3 Graphical representation of frequent and occassional usage of CD-ROM

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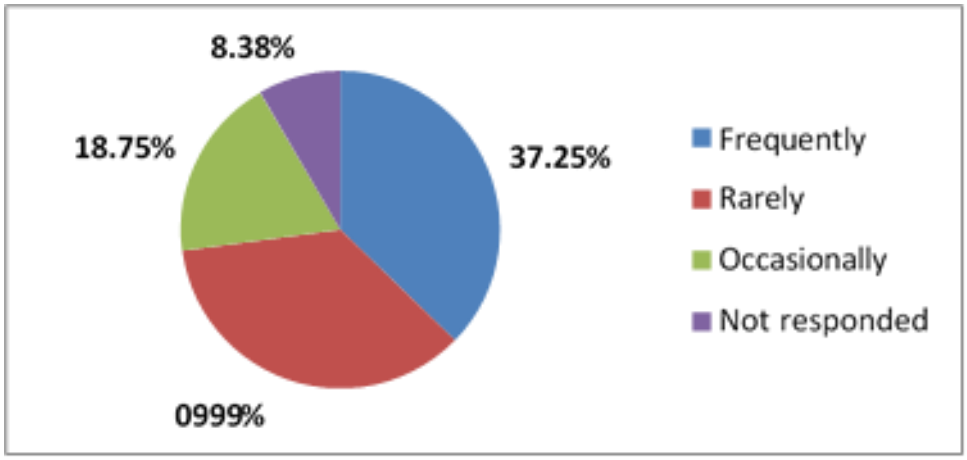

Fig. 4 Graphical representation of frequent and occassional usage of DVD

4.3 Moderately and Occasionally Used Tools

Tools such as DVDs showed moderate usage patterns. As shown in Table 2, 37.25% of respondents frequently used DVDs, while 35.62% used them rarely and 18.75% used them occasionally. This trend suggested a gradual decline in the use of DVD-based resources due to the increasing availability of online multimedia content.

Printers were mainly used on an occasional basis (35.63%), followed by rare usage (26.87%). This reflected a shift toward digital reading and soft-copy usage, reducing the dependence on printed materials.

4.4 Low Usage and Non-Usage of ICT Tools

Certain ICT tools recorded very low usage levels. Scanners, smart cards, and fax machines were among the least used devices. As evident from Table 2, 41.50% of respondents did not use scanners, while a substantial 66.00% did not use smart cards. Similarly, 46.13% of respondents did not use fax machines, indicating that these technologies had become largely obsolete or irrelevant in the present academic library environment. The use of iPads and similar tablets was also limited. More than 52.13% of respondents did not use iPads, suggesting either lack of availability in libraries or limited institutional support for such devices.

4.5 Overall Usage Pattern

The overall pattern of ICT tool usage is illustrated in Fig. 2, which showed that 34.90% of respondents used ICT tools frequently, whereas 20.83% used them rarely and 17.79% used them occasionally. The relatively high percentage of non-users (26.43%) highlighted a gap between ICT availability and actual utilization.

This situation was not encouraging, as it indicated that despite the presence of ICT infrastructure in some nursing college libraries, many users were either unaware of these facilities or lacked the necessary skills to use them effectively.

4.6 Discussion

The findings revealed a selective adoption of ICT tools in nursing college libraries of the Malwa region. Devices directly linked to personal academic work, such as laptops and pen drives, were widely used, whereas institution-dependent tools such as scanners, smart cards, and fax machines showed poor utilization.

The results suggested a need for user orientation programs, improved ICT infrastructure, and continuous training initiatives for both library staff and users. Enhancing awareness about available ICT resources and integrating digital literacy into academic programs could significantly improve the effective utilization of ICT-based library services.

5. Conclusions

The study concluded that ICT had played an important role in transforming library and information services in nursing colleges of the Malwa region; however, its adoption and utilization were not uniform across all user groups. The findings showed that ICT tools directly associated with personal academic work, such as laptops and pen drives, were widely used, whereas institution-based tools like scanners, smart cards, fax machines, and tablets were underutilized. A considerable proportion of respondents either rarely used or did not use available ICT tools, indicating gaps in awareness, accessibility, and technical skills. This situation suggested that the mere availability of ICT infrastructure did not ensure its effective use. The study highlighted the need for systematic user training, continuous professional development for library staff, and improved ICT support services. Overall, the study emphasized that strengthening ICT-enabled library services through planned initiatives could significantly enhance teaching, learning, and research activities in nursing colleges. The findings may assist library professionals, administrators, and policymakers in planning future ICT development strategies for academic libraries in the region

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