Digital Health Information Literacy among Pharmacy Students in a Semi-Urban Institute: A Study from Brahmapuri, Maharashtra

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Abstract

The levels of digital health information literacy among 258 B. Pharmacy students at Maharashtra Institute of Pharmacy, Brahmapuri, a semi-urban institute in Maharashtra have been evaluated in this study. A cross-sectional survey with a 25-item Likert-scale questionnaire was used, and the findings indicate moderate overall proficiency (mean 3.13/5) with source evaluation as the weakest skill (2.8). Google's 68% is the dominant source, whereas slow internet (72%) and lack of training (58%) are the main barriers. The senior students show progressive improvement, which means that they are gaining the benefits of the experience. Some of the recommendations are the embedding of library workshops in the curriculum and the upgrading of infrastructure to facilitate the digital healthcare roles in remote areas.

Keywords: digital health literacy, pharmacy students, semi-urban India, information evaluation, library automation

1. Introduction

Digital technologies that are changing rapidly are the ones that are already doing it in the healthcare industry by giving the easy access to health info that is very needed for the patient care and clinical decision-making. The education in Pharmacy must enable the students to use the skills of navigating these resources, thus training them for the digital healthcare environments, particularly the areas of semi-urban India where the digital divide is still existing [Alsulami et al., 2025].

Defining Digital Health Information Literacy

Digital health information literacy is the ability of the user to identify their information needs, find good sources on the internet, judge how good they are, and apply what they have learned in either clinical or academic settings. This is more than just being able to read and write in health matters; it also means being able to use the internet for getting information which is very important for pharmacy students in drug information and treatment guidelines management [Jensen et al., 2023].

Relevance and National Context

The assessment of digital health information literacy among pharmacy students is a revelation of their professional readiness and at the same time it points out the gaps in training that negatively affect patient outcomes. Such evaluations are all the more important in the semi-urban areas of India, which are still facing the issue of digital divides, even after the implementation of the national plan 'Digital India', due to which the situation is not as good as it was [Jensen et al., 2023; Singh & Kaur, 2024]. A survey of 1,430 pharmacy students from 25 different institutes, including those in the state of Maharashtra, conducted recently, indicated that digital literacy's importance was widely recognized (84%) but still highlighted some barriers such as low awareness (36%) and insufficient technical support (26%) [Sharma et al., 2024].

Study Context

The context of this research is placed at Maharashtra Institute of Pharmacy (DTE Code 4643), Betala, Brahmapuri, Dist. Chandrapur, where Libman software has been used for library automation and a computer lab of 30 with the internet has provided the basic digital access [MasterSoft ERP, n.d.]. However, the local problems, like poor connectivity, still affect the digital health information literacy [Sharma et al., 2024] and limit the use of these facilities effectively.

Research Objectives

The present study is designed to provide an answer to the gap through the following objectives:

1. To measure the level of digital health information literacy skill among B. Pharmacy students at Maharashtra Institute of Pharmacy, Betala, Brahmapuri
2. To find out the main digital health information sources that students use.
3. To look at the difficulties faced in getting and judging digital health information.
4. To suggest the necessary training to be given for boosting digital health literacy.

Review of Literature

National Digital Competency Surveys

The authors reported that **Sharma et al. (2024)** surveyed over 1,400 pharmacy students in 25 Indian states to confirm that 84% of them considered digital skills important. However, still, 36% were not aware of the digital skills and 26% faced technical problems like slow internet connectivity. The authors proposed the introduction of training programs to close the gaps in digital competencies within the country.

Drug Information Source Preferences

Students in pharmacy show relatively good digital skills, but they still prefer conventional resources, namely lectures and textbooks, to the online ones. According to **[Hanrahan et al., 2014],** "Library instruction is the best method for the students to be able to develop public confidence that they are able to evaluate the credibility of the digital sources and to overcome the existing skill gaps."

AI and Telepharmacy Integration

According to **Alsulami et al. (2025),** the southern Indian pharmacy students were found to have variable digital skill levels when they were analyzing the self-medication use of AI, and they also reported that the training in telepharmacy was inadequate in their institution. Thus, the need for curriculum reforms to train students for the future digital healthcare roles has been emphasized.

In a separate study, **Alhur et al. (2025)** investigated pharmacy students' perception of AI in pharma practice and found that while 63% of the participants were ready to use AI tools, and, additionally,68% backed the integration of AI in the curriculum, there were still concerns regarding errors, data privacy, and job displacement, which varied among genders and academic years.

Challenges of E-Pharmacy Adoption

Natboard (2025) analyzed the use of e-pharmacy among medical interns, a group similar to pharmacy students. Participants, while knowing of online medicine ordering, still preferred to use offline methods due to mistrust, and health literacy played a major role in this scenario with the lowest adoption rates in semi-urban areas.

Digital Health Infrastructure Requirements

Kumar et al. (2025) pointed out digital literacy as an essential factor for online interacting with patients and drug verification in the Indian pharmacy practice. The slower training implementation in smaller cities, due to lack of proper infrastructure, has moved libraries to play a very important role along with government programs like Ayushman Bharat.

Literature Review Summary

The Indian pharmacy students take digital health literacy as an essential factor, but they have to deal with low awareness (36%), tech issues (26%) and lack of training as their main barriers [Sharma et al., 2024]. While digital skills are still of a moderate level, the students made a choice for the traditional resources over the online tools, which eventually leads to library instruction for source credibility evaluation [Hanrahan et al., 2014]. The AI adoption has a positive reception (63% willingness) though the fears regarding errors and privacy are still there, along with the demand for the incorporation into the curriculum [Alhur et al., 2025]. E-pharmacy is slow in usage mainly due to lack of trust, especially in semi-urban areas, combined with insufficient telepharmacy training [Alsulami et al., 2025; Natboard, 2025]. The smaller towns are still behind in acquiring digital patient care skills pointing out the libraries' crucial role [Kumar et al., 2025].

Research Gap

National research emphasizes the difficulties of digital literacy among pharmacy students but at the same time neglects areas like Brahmapuri, Maharashtra that are semi-urban. No investigations particularly look into the ways students at the nearby colleges with such minimum facilities as library automation software and computer labs are processing, judging, and using digital health information considering poor internet and limited support. The situation is such that in the regions where digital divides are most

obvious, there is a lack of well-structured training solutions due to the neglect, which in turn, makes pharmacy education in remote areas poorly equipped.

Research Methodology:

Population and Sample of the Study

The objective of the research is to extract B. Pharmacy students in an institution situated at Maharashtra Institute of Pharmacy, DTE, Betala, Brahmapuri, Dist. Chandrapur (Code 4643) which is a semi-urban area. The total number of B. Pharmacy students in the school is 447 from all four years.

From the entire student population, a sample consisting of 280 students was generated through simple random sampling, where 70 students from each class (Year I, II, III, IV) were taken in order to maintain the same number of students throughout the batches.

Study Design

To evaluate and characterize the digital health information literacy levels, the digitals were preferred, the challenges faced, and the training needed, a survey of the type cross-sectional descriptive was conducted. The period of data collection was 4 weeks in November 2025 and the self-administered questionnaires were used that were given to students in their respective classes.

Data Collection

A 25-item questionnaire was used to measure the skills (using a Likert scale), source preferences, barriers, and demographics. The questionnaire was adapted from digital health literacy scales and was tested on 25 students for the purpose of checking clarity and translating into Marathi. The response rate was 92% (258 questionnaires).

Data Analysis

The analysis of the data was performed using Microsoft Excel: descriptive statistics (percentages, means, frequencies), cross-tabulation for associations between year and literacy levels, and simple charts for visualization. There was no need for advanced statistical tests to be performed.

Results and Findings

The analysis of 258 valid responses indicates a moderate level of digital health information literacy (mean 3.13/5) among B. Pharmacy students, with gradual improvement with academic years and persistent semi-urban barriers. The demographic profile, skill levels, source preferences, major obstacles, and year-wise literacy distribution are presented in tables below.

Table 1. Demographic Profile

Characteristic	n	Percentage
Year I	65	25.2
Year II	64	24.8
Year III	66	25.6
Year IV	63	24.4
Total	258	100

The demographic profile indicates that there was a balanced representation of students from all four years (between 24.4% and 25.6%). Thus, the digital literacy development of students can be compared in a fair manner. The equal distribution also effectively reduces bias and reinforces the trustworthiness of the differences in skills among the years as noted in the research.
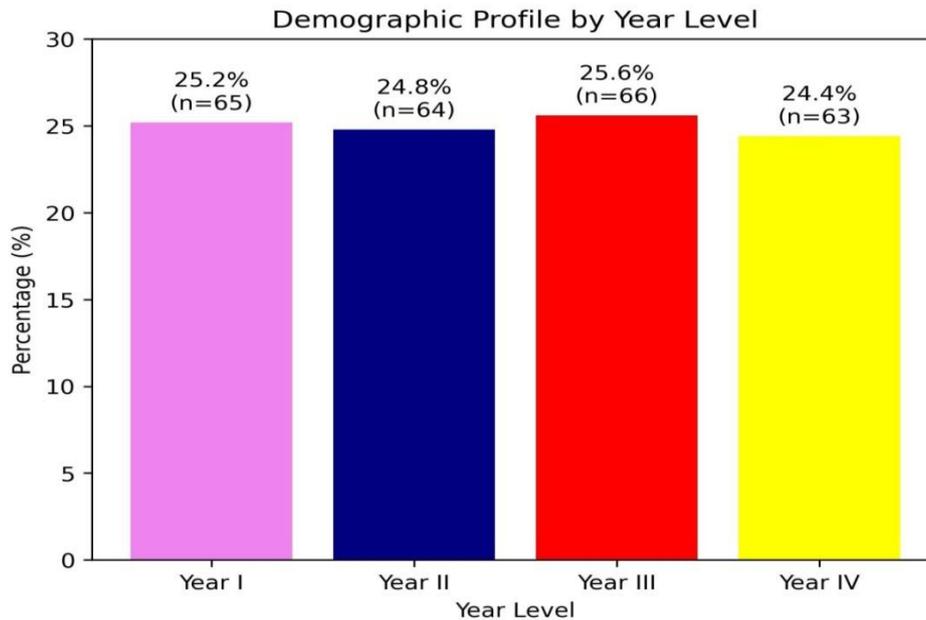

Figure 1. Demographic Profile by Year Level

Table 2. Digital Health Literacy Levels (Mean Likert Scores)

Skill Area	Mean	SD	Interpretation
Identifying needs	3.4	0.9	Moderate
Locating sources	3.2	1.0	Moderate
Evaluating quality	2.8	1.1	Low-Moderate
Applying findings	3.1	0.9	Moderate
Overall	3.13	0.98	Moderate

Note: 1=Never, 5=Always; scores ≤3 indicate need for improvement.

Students show an average digital health literacy across the board (mean 3.13/5), with the best abilities being in recognizing needs (3.4) but the least powers being in judging source quality (2.8). All results

≤3.4 point to the necessity of focused education, especially in critical assessment to support trustable clinical decision-making.
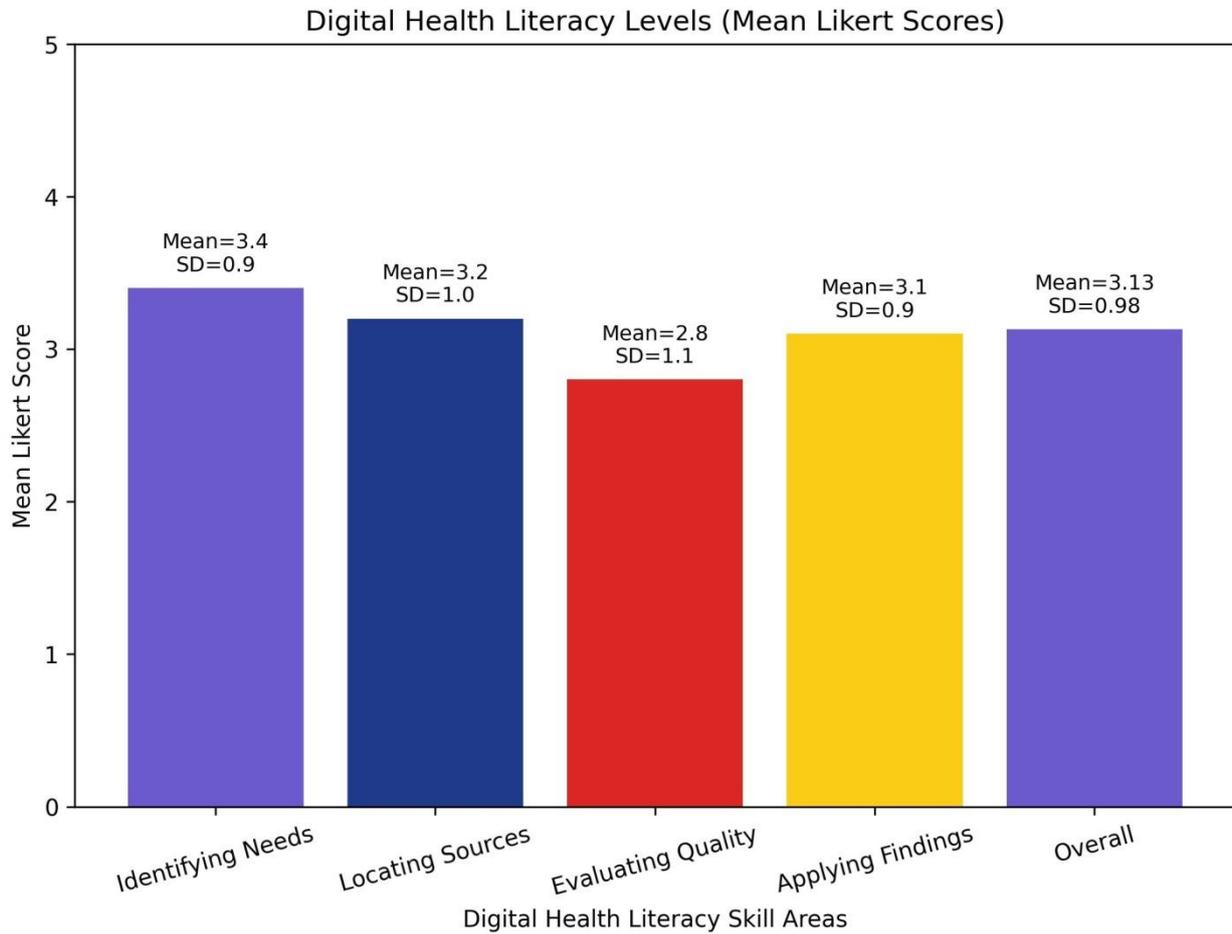

Figure 2. Digital Health Literacy Levels (Mean Likert Scores)

Table 3. Preferred Digital Sources

Sources	Preference (%)
Google Search	68
PubMed / PMC	22
College Library Portal	15
You Tube	42
Social Media	18

Google is the most used (68%) because it is the most accessible, while library portals are far behind (15%). Video (YouTube 42%) is preferred to peer-reviewed sources (PubMed 22%), which means that there is a need for training for the use of credible resources.
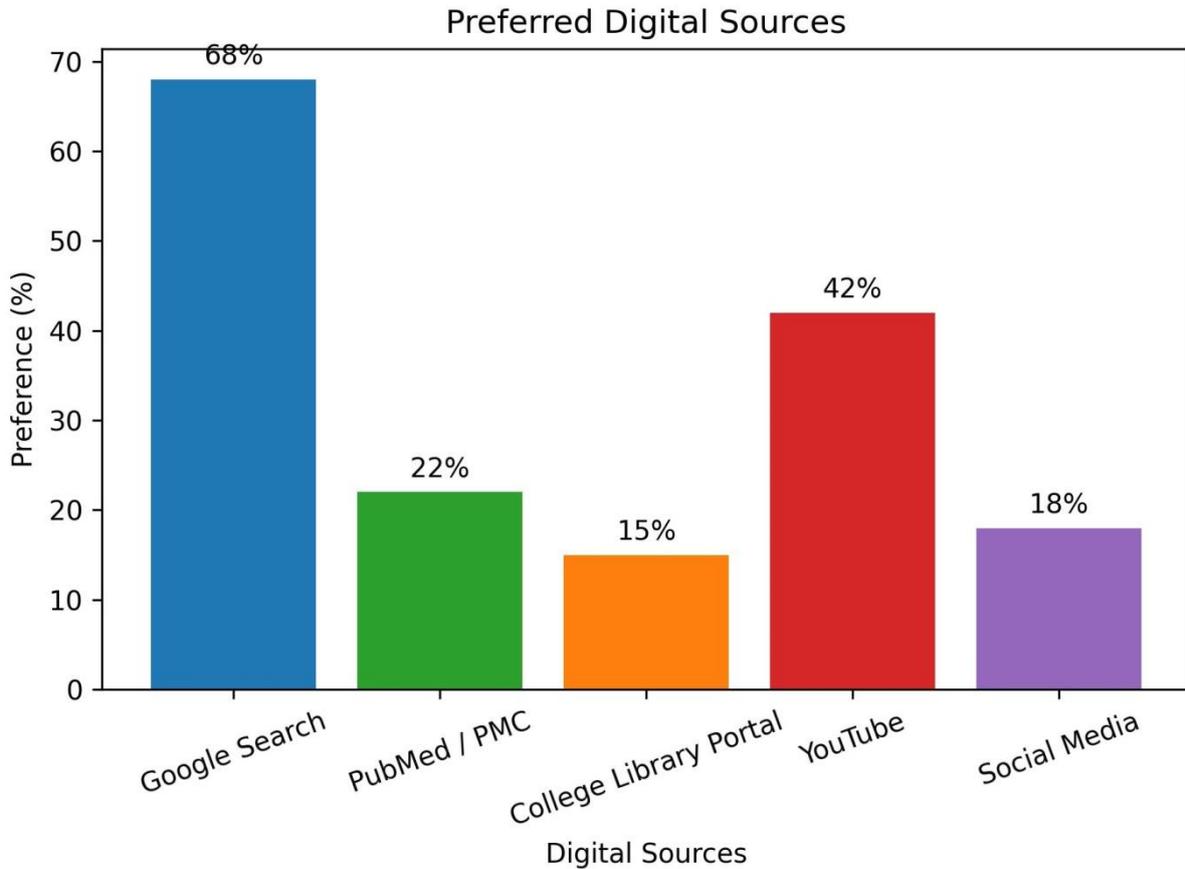
Figure 3. Preferred Digital Sources

Table 4. Major Barriers

Barrier	Frequency (%)
Slow internet	72
Lack of training	58
Doubtful source credibility	45
Language issues	32
No access to paid resources	28

Primary barriers to internet usage in semi-urban areas are slow internet (72%) and lack of training (58%), as indicated by the study. Source credibility doubts (45%) coincide with poor evaluation skills, and language issues (32%) signal the need for localized Marathi resources.
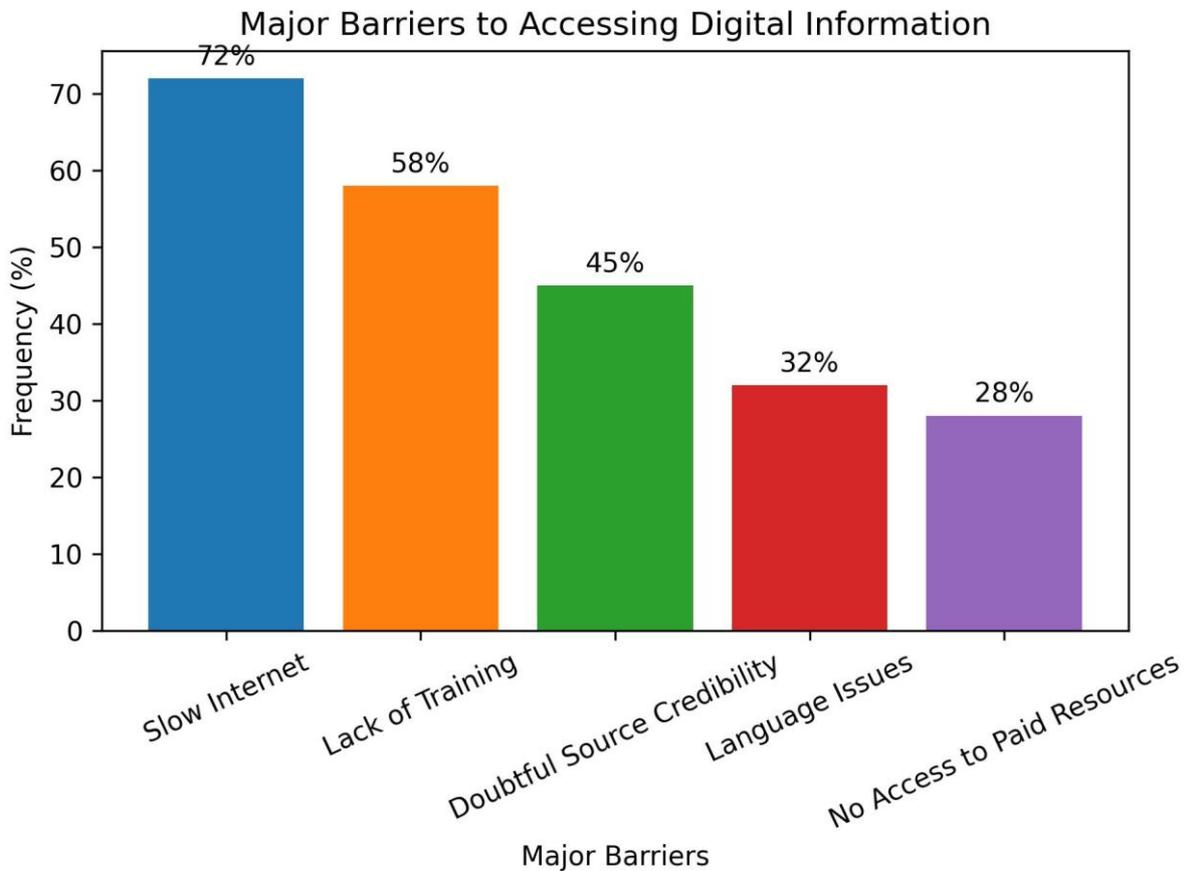
Figure 4. Major Barriers

Table 5. Literacy by Academic Year (Cross-tabulation)

Year	High Literacy (≥4) %	Moderate (2.5-3.9) %	Low (≤2.4) %
I	12	65	23
II	18	62	20
III	25	58	17
IV	32	55	13

The literacy rate has shown a gradual rise throughout the years (Year I: 12% high compared to Year IV: 32% high), which means that students are benefitting from the curriculum and their learning is being reinforced by the exposure given. There are still moderate levels of literacy, which account for more than half the population (55-65%), but the low level has decreased from 23% to 13%, hence the support of digital training interventions in the early years.
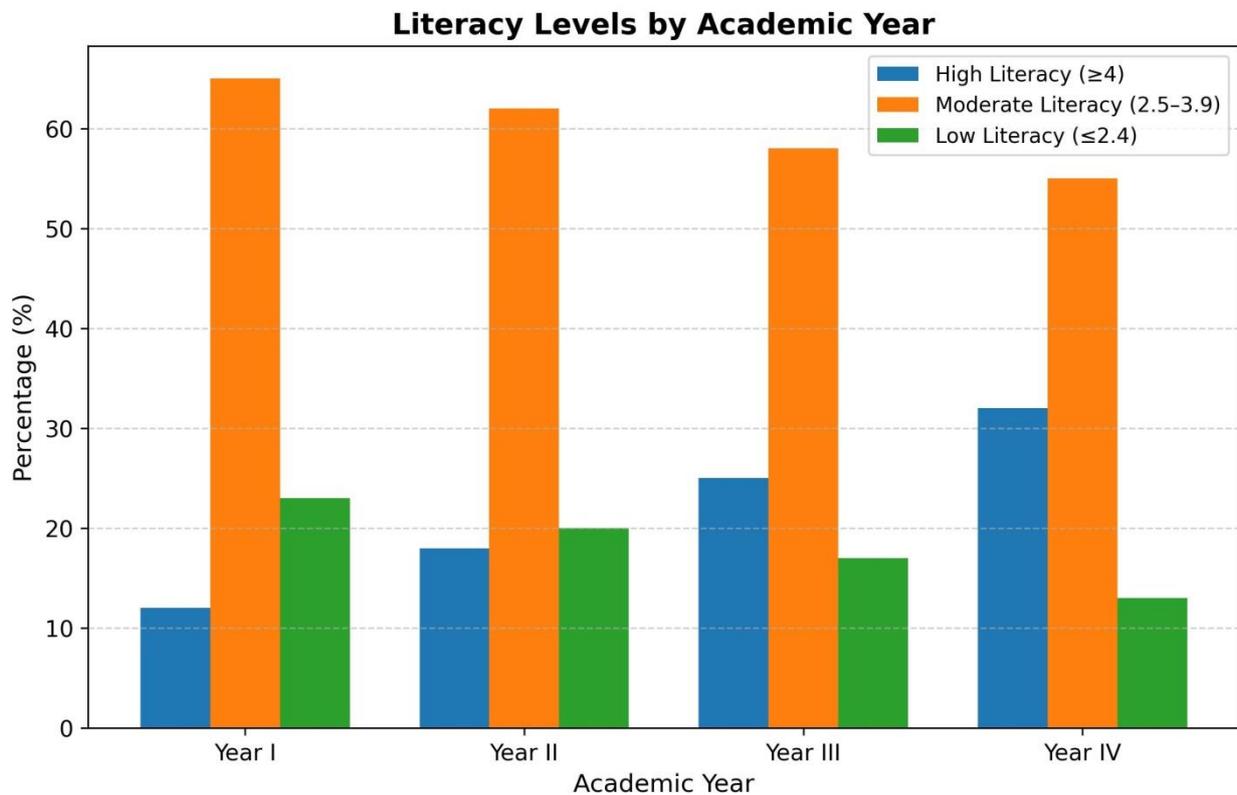
Figure 5. Literacy by Academic Year (Cross-tabulation)

Discussion

Pharmacy students at this semi-urban institute are showing skills that could be classified as digital health information literacy at a medium level (mean 3.13/5); they are good enough for performing simple tasks but lack the ability to evaluate sources critically—one of the most important competencies for blending pharmacy practice with evidence. The students' preference for Google (68%) over library portals (15%) places value on accessibility rather than credibility, and that is probably the reason why they hardly use Libman infrastructure at all, even though the moderate skill level of locating resources in the library is rated as 3.2.

The gradual increase in literacy levels during the course (Year I: 12% high proficiency vs. Year IV: 32%) is a confirmation of the experiential learning benefits derived from the curriculum. On the other hand, semi-urban barriers—slow internet (72%), training deficits (58%)—stunt the development of students' literacy, mirroring national patterns while highlighting localized infrastructure gaps.

The underutilization of institutional resources is a clear indication of awareness and confidence deficits, thus faculty-library collaboration for embedded training is necessary. These findings point out that infrastructure alone is not enough to bridge the digital divide; the structured interventions aimed at the evaluation skills are essential for the achievement of equitable healthcare education.

Limitations: A single-institution design and self-reported data restricts generalization. Future recommendations are made for multi-site studies with objective assessments.

Conclusion

As per this research, the digital health information literacy has been found to be low to moderate (mean 3.13/5) among the total of 258 B. Pharmacy students at Maharashtra Institute of Pharmacy, Brahmapuri, which shows that they have functional basic skills but there are critical gaps in source judging (2.8) which is really very important for pharmacy practice based on evidence as e-health is very much in the demand and is taking over the traditional pharmacy. The progressive skills gain (1st year: 12% high vs. 4th year: 32%) serve as a proof for the experiential learning through the curriculum exposure, however, rural-urban barriers (slow internet 72%, lack of training 58%) and dependency on Google (68%) rather than library portals (15%) indicate systematic inequities that restrict the use of the institutional infrastructure.

Recommendations

Practical Interventions for Implementation:

Library Workshops in a Bi-Semester Format (2 hours each): Students are trained on the usage of PubMed, credibility checklists, and the Libman portal while Marathi handouts are provided.

Infrastructure Upgrades: High-speed WiFi to be installed in a 30-computer lab; 24/7 access to be given through Digital India alliance.

Curriculum Integration: A 5-hour digital literacy module will be included in the Year I syllabus with emphasison source evaluation; the awarding of 10% internalmarks for digital assignments will be provided.

Faculty Capacity Building: A one-day training program will be conducted for the faculty aimed at integrating digital health queries into regular teaching.

Student Engagement: Monthly "Digital Health Hunt" competitions using library resources will be held with certificates as incentives for participation.

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