



Assessment of Knowledge Attitude and Practice on Research and the Barriers Among Pharmacy Students, Chennai, India

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ABSTRACT

Background: Pharmacy students are integral to the advancement of healthcare, and their role extends beyond traditional pharmacy practice to the realm of scientific research. Research in pharmacy not only contributes to the development of new drugs and therapies but also improves patient care, enhances clinical practices, and shapes public health policies. However, the level of research involvement and engagement among pharmacy students can vary greatly, often influenced by their knowledge of research methodologies, attitudes toward scientific inquiry, and the practical challenges they face in participating in research.

Objectives: To assess the knowledge, attitude, and practice (KAP) of research among pharmacy students and identify barriers affecting research participation. Additionally, the study aims to explore measures to enhance research interest and engagement among pharmacy students.

Methods: A cross-sectional descriptive study was conducted among pharmacy students from various universities in Chennai. A structured questionnaire was used to evaluate students' knowledge, attitude, practice, and perceived barriers toward research.

Results: A total of 200 students participated and completed the survey. The findings indicate that positive attitudes toward research were strongly influenced by exposure to research activities through academic projects, peer interactions and future aspirations for research-oriented careers. Both quantitative and qualitative analyses suggest that integrating research exposure into the pharmacy student's curriculum can foster positive perceptions of research, particularly in its application to clinical practice. However, students reported a lack of awareness regarding the significance, benefits, and career opportunities in pharmacy research, along with perceived barriers that hinder their interest in research-related career paths.

Conclusions: This study highlights the current state of knowledge, attitudes, and practices (KAP) regarding research among pharmacy students, as well as the barriers preventing active engagement. While students demonstrate a generally positive attitude toward research and recognize its significance in their professional development, significant gaps remain in practical research skills and application. A lack of confidence, insufficient research training, heavy academic workloads, and limited institutional support emerged as key barriers. Addressing these challenges will not only enhance students' academic experiences but also prepare them to contribute meaningfully to evidence-based pharmaceutical practice and innovation in healthcare.

Keywords: Pharm D, Research, Barriers, KAP study.

INTRODUCTION

Research has a crucial role in the profession of pharmacy as it aids in updating the healthcare knowledge, providing more efficient drug therapy, and promoting evidence based practices. Pharmacy students; being the future of healthcare profession should be actively engaged in research activities rather than acquiring theoretical knowledge alone, in order to provide their contribution to the developing patient care strategies and medical practices. An assessment of knowledge, attitude and practice (KAP) on research among pharmacy students can give us an idea about their preparedness and willingness to perform research activities during their academic journey and later in their careers. The research practice can improve critical thinking, scientific inquiry and the application of evidence to clinical practice.

In KAP assessment knowledge, attitude and practice of the candidates are examined. Knowledge refers to the student's understanding on research methodologies,

design and statistical analysis. It also checks their awareness about research ethics and the importance of literature review¹. Attitude pertains the perception of a student. This part of the assessment is to understand a student's values and beliefs regarding the importance of research in their profession. Positive attitude can be considered as a reflection of a student's enthusiasm and participation in research while negative attitude can be associated with hinder academic performance and professional development². On the other hand Practice section of the assessment helps to know how much students are participating in research activities during their academic journey³.

Although the importance of research in pharmacy profession is well known, there does exist several barriers, preventing students from engaging completely in research activities. These barriers can range from lack of time due to heavy academic workload, limited access to resources, insufficient mentorship and lack of training in research methodologies⁴. Lack of motivation or confidence in one's



own research abilities can also stand as a barrier in participating in research activities⁵. It is important to identify these barriers and develop strategies to overcome them in order to cultivate more efficient research culture among pharmacy students.

Various studies have explored the KAP of pharmacy students in different regions, finding significant differences in knowledge levels, attitudes towards research, and the extent of research practice. Few studies found that while pharmacy students generally possess a positive attitude towards research, they often lack adequate knowledge and practical experience in conducting research⁶.

Understanding these dynamics is critical to improving pharmacy education and fostering a research-oriented mindset among students. By assessing KAP and identifying barriers, educators and institutions can implement tailored strategies to promote research engagement, such as incorporating research training into the curriculum, offering more research-oriented internships, and providing mentorship opportunities. This not only enhances the students' academic experience but also prepares them to become active contributors to the field of pharmacy and healthcare at large.

Methodology:

Study Objectives

A descriptive cross-sectional study was conducted with the primary objective of assessing the knowledge, attitude, and practice levels regarding research among pharmacy students. The secondary objectives include identifying specific barriers to research engagement and proposing actionable strategies to address these challenges. The study aims to answer the following questions:

1. What is the current level of research knowledge among pharmacy students?
2. How do students perceive the value of research in their education and career?
3. What is the extent of students' involvement in research-related activities?
4. What are the main barriers that hinder students from participating in research?

Sample Size

The sample size was determined using a 95% confidence level and 7.5 % margin of error and it was estimated to be 173 and the sample size was then rounded to 200. Random sampling method was used to enroll targeted sample size of 200 pharmacy students from various pharmacy college. Data was collected using a structured, self-administered questionnaire that has been designed to capture comprehensive information on the variables of interest.

The questionnaire was validated by our department experts and we have conducted pilot study among 20 students and necessary corrections were made in the questionnaire accordingly. The survey questionnaire was distributed to all

the study participants and the responses were collected and analyzed. Descriptive statistics, including frequency and percentage distributions, were used to summarize the data. KAP responses were evaluated using Bloom's taxonomy-based cut-off criteria to classify knowledge levels and assess attitudes and practices.

RESULTS

The results from this study underline important facts regarding the knowledge, attitudes, and practices (KAP) of pharmacy students toward research. Although most students showed some level of understanding of the key concepts of research, there was a significant limitation in the depth of knowledge, thus pointing to a need for further integrated curriculum development regarding research education.

Table 1: Socio-demographic details.

Variables (N=200)	N (%)
Gender	
Male	92 (46%)
Female	108 (54%)
Department	
B. PHARM	35 (17.5%)
M. PHARM	41 (20.5%)
PHARM.D	122 (61%)
Unknown	2 (1%)

Awareness: A good number of the students showed knowledge of the core research methods and their significance in advancing pharmaceutical sciences. However, indicatives were noted of failure in the application of this knowledge in a study's design and execution. This mirrors already existing literature that proposes theoretical knowledge often exceeds that of practical application among undergraduate students.

Attitudes: On the whole, attitudes towards research were very positive whereby students agreed that research has a huge impact on shaping clinical practices and patient outcomes. However, a significant percentage of respondents admitted that they did not feel as confident as they should in their ability to conduct research which could be attributed to lack of proper exposure or support in the course of their academic development.

Research Activities: Engagement in research activities was fairly low. The most significant barriers identified were time constraints, academic workload, and limited access to mentorship and resources. Findings emphasize the need for structured opportunities such as research internships or collaborative projects that can help integrate theoretical knowledge with practical experience.

Barriers: The principal barriers identified were a lack of research mentorship, inadequate training in statistical tools, and limited institutional support. Overcoming these barriers will require a multi-faceted approach, including



development programs for faculty, enhanced funding to student-led initiatives, and the incorporation of research components into existing coursework.

Implications: This study emphasizes the need for a research-conducive environment within pharmacy

education. While addressing the identified barriers to active engagement in research, academic institutions may better prepare future pharmacists to develop evidence-based practice and innovation in health care.

Knowledge-based Questions

Table 2: Knowledge-based responses

S. No	Knowledge Questions	Correct N(%)	Incorrect N (%)
1	What is a research paper?	196 (96%)	4 (4%)
2	Which of the following is the most recent and dependable source of information on a board scientific paper?	111 (55.5%)	89 (45.5%)
3	Which of the following acts is considered plagiarism?	160 (80%)	40 (20%)
4	In the process of identifying the objective of research, the research must finalize the....	18 (9%)	182 (91%)
5	Research journals with high _____are commonly considered to be	160 (80%)	40 (20%)
6	PRISMA stands for	78 (39%)	122 (61%)
7	MeSH stands for	126 (63%)	74 (37%)

The study assessed participants' knowledge of research practices, revealing varying levels of understanding. Most participants (96%) correctly identified what constitutes a research paper, but only 55.5% could identify the most reliable source of information in scientific literature. Understanding of plagiarism was strong, with 80% providing accurate responses. However, only 9% demonstrated knowledge of finalizing research objectives, indicating a significant knowledge gap. Familiarity with research journals and impact scores was relatively high (80%), while awareness of PRISMA and MeSH stood at 39% and 63%, respectively. These results highlight the need for targeted education to address specific gaps in research knowledge. (Refer Table 2)



Figure 1: Knowledge based responses

Table 3: Attitude Based Responses

S.No	Attitude Questions	Positive N%	Negative N %
1	Attending conferences and workshops encourage doing research	178 (89%)	22 (11%)
2	Research work adds value to the resume.	182 (91%)	18 (9%)
3	You think that research is not very important for the pharmacy profession	61 (30.5%)	139 (69.5%)
4	Doing research is often a hectic, time-consuming process.	91 (45.6%)	109 (54.4%)
5	You think lack of confidence is a barrier to the research	39(19.5%)	161(80.5%)
6	Research is only meant for those who are planning to become research scientists in the future	108 (54%)	92 (46%)
7	Do you lack enthusiasm for conducting research?	137(68.5%)	63(31.5%)

ATTITUDE BASED RESPONSE:

The study revealed distinct patterns in positive and negative attitudes toward research, providing insights into the participants' perceptions and barriers.

Positive Attitudes:

- A strong majority (89%) believed that attending conferences and workshops positively influences



engagement in research, highlighting the value of academic events in motivating participation.

- Most respondents (91%) recognized that research work enhances their resumes, indicating awareness of its career benefits.
- Additionally, (69.5%) disagreed with the idea that research is unimportant in the pharmacy profession, demonstrating an appreciation of its relevance in their field.
- Over half (54%) rejected the notion that research is exclusively for those planning careers as research scientists, reflecting an inclusive perspective on research participation.
- Nearly half (45.6%) agreed that research is a hectic and time-consuming process, potentially indicating a barrier to engagement due to perceived workload.
- A majority (68.5%) reported lacking enthusiasm for conducting research, which underscores motivational challenges.
- Interestingly, only (19.5%) identified lack of confidence as a barrier, suggesting that other factors, such as interest or support systems, may play a more significant role.
- Lastly, (46%) still believed research might not be essential for non-research career paths, reflecting lingering misconceptions about its broader applicability.

In conclusion, the study highlights a generally positive attitude toward research among participants, with most recognizing its importance, career value, and accessibility across various professional pathways. However, notable barriers such as perceptions of research being time-consuming, a lack of enthusiasm, and lingering misconceptions about its relevance for non-research career paths were also identified. Addressing these challenges through targeted educational initiatives, motivational strategies, and opportunities for practical research exposure could significantly enhance engagement and

foster a more research-oriented mindset in the pharmacy profession.

The study assessed practical challenges and supports for engaging in research activities, revealing a mix of positive practices and significant barriers. Faculty encouragement emerged as a strong positive influence, with 71% of participants acknowledging their support in fostering research involvement. Furthermore, 85.5% of respondents recognized the critical role of research in identifying and solving pharmacy-related problems, highlighting an appreciation for its practical value in their field.

However, several barriers to research engagement were identified. Time constraints due to academic overburden were reported by 61% of participants, reflecting difficulties in balancing educational and research responsibilities. Additionally, systemic challenges such as difficulty in patient follow-up and sample collection (71%), lack of funding (75.5%), and inadequate facilities (70.5%) were prominent concerns. Communication skills were also highlighted as a barrier, with 49.5% agreeing and 50.5% disagreeing, indicating varied experiences among participants. Refer (Table 4).

In conclusion, while participants value research and benefit from faculty support, they face significant challenges that hinder active engagement. Addressing these barriers through resource allocation, skill-building workshops, and strategies to manage academic workloads is essential to creating a research-friendly environment in academic settings.

DISCUSSION

This study explored the knowledge, attitudes, and practices regarding research among pharmacy students and identified barriers impacting their engagement. The analysis highlights key findings and provides insights into the students' understanding, perceptions, and behaviors related to research, with implications for addressing gaps and improving participation.

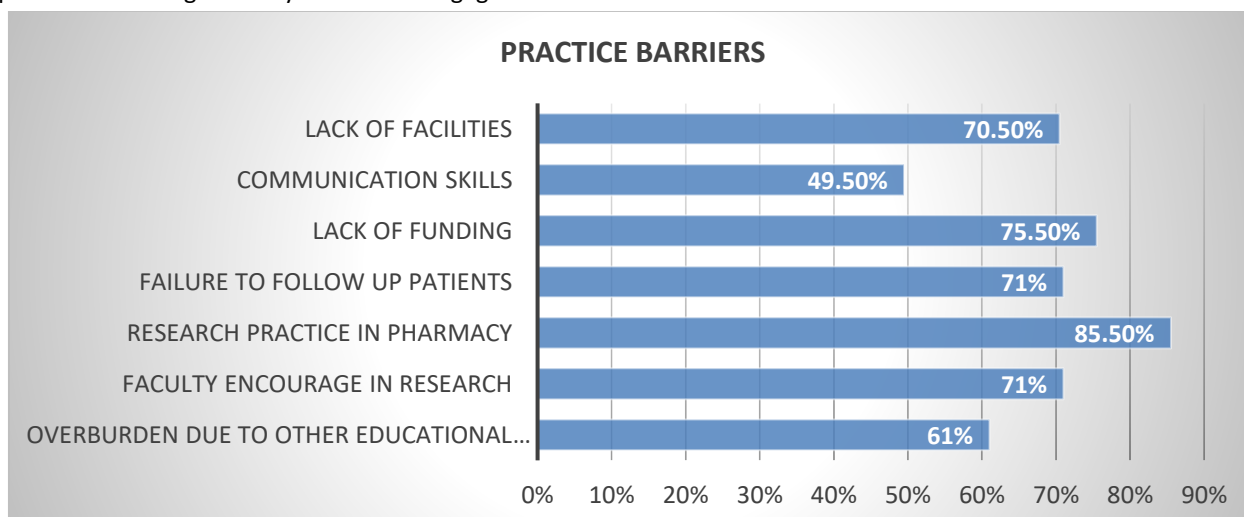


Figure 2: Practice Barriers



Table 4: Practice Based Responses

Sno	Practice Questions	Positive N (%)	Negative N(%)
1	You are overburdened with other educational activities of college which provides inadequate time to do research?	122 (61%)	78 (39%)
2	Faculty encourage to participate in research activities	142 (71%)	58 (29%)
3	Research practice is important in identifying and investigating problems in pharmacy	171 (85.5%)	29 (14.5%)
4	Failure to follow patients and difficulty in the collection of samples is a barrier to the research	142 (71%)	58 (29%)
5	Lack of funding is a problem for doing research	151 (75.5%)	49 (14.5%)
6	Do you find communication skills as a barrier to the research ?	99 (49.5%)	101 (50.5%)
7	Lack of facilities is a barrier for doing research	141 (70.5%)	59 (29.5%)

Knowledge about research

The findings revealed that 60.5% of participants had a basic understanding of research concepts, including recognizing research papers, the significance of research journals, and the role of systematic reviews. Specific knowledge areas, such as identifying myths about research practices, showed lower comprehension levels, with only 57% responding correctly. This gap is similar to patterns observed in other studies, where knowledge about research varies significantly based on the availability of structured education and training opportunities.^{1,3}

In comparison, Western countries have implemented comprehensive academic curricula and training programs that emphasize research literacy, enabling higher knowledge levels among students. For example, students in the U.S. are often introduced to research methodologies early in their academic journey, which contributes to their proficiency in understanding and applying research concepts². To align with such global practices, pharmacy programs in Chennai and India could incorporate structured research-focused modules, workshops, and seminars aimed at enhancing students' understanding of fundamental concepts and their real-world applications.^{2,7}

Attitude towards research

A positive attitude toward research was evident among participants, with 85.7% agreeing that research is valuable and contributes to career growth. Additionally, 84% expressed satisfaction with their limited research experiences. However, a cautious outlook was also observed, with 56.5% of students expressing concerns about the time-consuming nature of research, and 40% preferring to avoid research without proper guidance. This reflects a balanced attitude where participants appreciate the importance of research but remain wary of its challenges.^{4,5}

Similar trends have been observed in Western countries, where students and professionals often value research for its role in advancing careers and improving clinical practices. Regulatory and institutional support, such as mentorship programs and accessible research opportunities, has bolstered these attitudes.⁸ In Chennai, fostering a similar

supportive environment, including dedicated faculty mentorship and research grants, could strengthen students' positive outlook and encourage greater participation.¹¹

Practices related to research

The study revealed that 58.8% of participants had engaged in some form of research, with 73.7% doing so sporadically. However, only 31.4% felt confident about their research practices, highlighting a significant gap between participation and competency. These findings align with global trends, where lack of training and limited exposure often result in inconsistent research engagement.^{1, 10}

In contrast, Western institutions often report higher consistency in research practices among students due to well-established infrastructure, funding opportunities, and clear guidelines. For instance, students in the U.K. and U.S. benefit from structured research mentorship, collaborative projects, and access to advanced tools and facilities, enabling them to practice research consistently⁶. Adopting similar strategies in Indian pharmacy schools, including regular workshops, collaborative opportunities, and accessible research resources, could improve research participation and competency among students.⁹

Barriers to research participation

Several barriers to research were identified, including overburdening academic schedules (61%), lack of funding (75.5%), and inadequate facilities (70.5%). Patient follow-up challenges (71%) and communication skill deficits (49.5%) also emerged as significant obstacles. These barriers are consistent with those reported globally, where insufficient resources, heavy academic loads, and systemic inefficiencies hinder active research participation.^{4, 12}

Western countries have addressed such barriers through policy-level interventions, such as research funding programs, grants for student researchers, and institutional support systems. For example, the National Institutes of Health (NIH) in the U.S. provides student grants that alleviate financial constraints and encourage participation⁷. Similarly, strengthening funding opportunities, reducing academic workload, and improving research infrastructure



in Chennai could help overcome these barriers and foster a research-friendly academic environment.⁸

Implications and Recommendations

The study underscores the need to bridge the gap between knowledge, attitudes, and practices regarding research among pharmacy students. While the overall attitude toward research is positive, barriers such as inadequate training, lack of resources, and insufficient time significantly hinder participation. Drawing from successful practices in Western countries, the following recommendations could be implemented

- **Educational Programs:** Introduce structured research training modules and integrate research methodologies into the pharmacy curriculum.^{1,3}
- **Faculty Mentorship:** Establish formal mentorship programs where faculty actively guide students in research activities.^{5,9}
- **Funding and Resources:** Increase funding for student research projects and improve access to necessary facilities.¹⁰
- **Skill Development:** Conduct workshops on communication, time management, and patient interaction to address identified skill gaps.⁴
- **Public Awareness Campaigns:** Promote the value of research through institutional campaigns and highlight its role in improving clinical and professional outcomes.^{11,12}

By implementing these measures, pharmacy schools can cultivate a more research-oriented academic culture, empowering students to overcome barriers and actively participate in research activities.

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