Khalij Libya Journal of Dental and Medical Research. 2025;9(2):300-307
https://doi.org/10.47705/kjdmr.259224
eISSN:2708-888X

Original article

Knowledge, Attitudes, and Barriers toward Research Methodology Among Intern Doctors at Misurata University

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Abstract
Research is fundamental to advancing medical science, informing evidence-based clinical practice, and promoting professional *growth for newly graduated doctors. However, many intern doctors face barriers such as limited exposure, insufficient time, and inadequate training, which hinder their participation in research activities. The internship period is an ideal time to acquire complex skills, such as research methodology. This study aimed to assess knowledge, attitudes, and perceived barriers to medical research among intern doctors at the Faculty of Medicine, Misurata University. A descriptive cross-sectional survey was conducted among intern doctors at the Faculty of Medicine, Misurata University, Libya. Data were collected from 58 participants (response rate of 74.4%) using a self-administered Google Forms questionnaire. The instrument assessed personal data, knowledge (15 multiple-choice questions), attitude (11 Likert scale statements), and perceived barriers. Knowledge and attitude scores were categorized into Poor/Negative, Moderate/Neutral, and Good/Positive levels. Inferential statistics (t-tests) were used to compare scores across different groups, with a p-value <0.05 considered significant. The mean knowledge score was 6.88±2.82, indicating generally poor knowledge, with 51.7% of participants in the "Poor Knowledge" category. In contrast, the mean attitude score was 41.69±7.34, corresponding to a positive attitude, with 55.2% of participants demonstrating a positive attitude. Key perceived barriers included difficulty in accessing study samples (82.7%), feeling of inadequate statistical skills (81.0%), and lack of time (78.9%). Notably, prior research training and project contribution were associated with significantly more positive attitudes. Intern doctors show a strong, positive attitude toward scientific research but possess poor knowledge of research methodology. Prior exposure to research, such as training and project contribution, is essential for fostering positive attitudes. Recommendations include integrating structured, practical research training into both undergraduate and postgraduate curricula to bridge the significant knowledge gap and address perceived barriers.*
Keywords. *Research Methodology, Intern Doctors, Knowledge, Attitudes, Barriers.*

Received*: 21/09/25*
Accepted*: 22/11/25*
Published*: 02/12/25*

Introduction

Research serves as the cornerstone for advancement in every scientific discipline, relying on the collective contributions of systematic and well-structured investigations. The core purpose of any research is to address unanswered questions and generate new knowledge [1]. It is a structured and methodical process aimed at developing new insights, scientific understanding, or innovations through the application of standardized methods and the re-evaluation of existing information. In nearly all branches of science, research remains the essential instrument for broadening and enriching the body of available knowledge [1]. Medical research plays a fundamental role in clinical practice, supporting evidence-based decision-making and enhancing physicians' ability to critically appraise medical literature. For newly graduated doctors, engaging in research can foster professional growth and ensure they stay up-to-date with the latest medical advances [2]. However, many intern doctors experience hesitation and a lack of confidence when it comes to understanding or participating in research activities. This may be due to limited exposure, a lack of time, or insufficient training during their undergraduate years [3]. Other barriers that hinder their involvement in medical research include limited time allocated for research activities, insufficient statistical skills, and the heavy workload associated with other educational responsibilities. Additionally, the absence of tangible rewards or recognition and limited personal understanding of the research process further discourage active participation in research projects [4].

Educational studies have shown that learning is generally more effective at a younger age, when cognitive flexibility, memory capacity, and adaptability are at their peak. Building on this, the internship period—being a stage of early clinical exposure in young adulthood—represents an ideal time for acquiring complex skills such as research methodology. Compared to later stages of a medical career, when responsibilities increase, and habits become more fixed, learning during internship is often easier, faster, and more impactful [5]. Integrating medical research training into the undergraduate medical curriculum is essential for preparing competent and reflective practitioners. Early exposure to research develops critical thinking, analytical skills, and the ability to evaluate and apply evidence—core competencies in evidence-based

https://doi.org/10.47705/kjdmr.259224
eISSN:2708-888X

medicine. Embedding research components within the curriculum ensures that all students, including those with no prior experience, can progressively build both the knowledge and confidence required to engage in research. The internship year then serves as a practical extension of this foundation, allowing graduates to apply and refine these skills in real clinical contexts. While the inclusion of research activities alongside existing academic demands may be challenging, evidence indicates that students can achieve substantial gains in research competence despite these pressures. Incorporating structured research training throughout the curriculum is therefore a strategic approach to cultivating lifelong learning and advancing the quality of medical practice [6].

In this study, we aim to assess the knowledge and attitudes of intern doctors in the Faculty of Medicine-Misurata University toward medical research, and to evaluate if there are differences in research methodology knowledge and attitudes among participants according to gender, age, prior training, and contribution to research projects.

Methodology

Study Design

This study was designed as a descriptive cross-sectional survey conducted among intern doctors at the Faculty of Medicine- Misurata University. A cross-sectional design was chosen as it allows the assessment of knowledge, attitudes, and perceived barriers toward medical research at a single point in time, providing a snapshot of the current status without the need for follow-up.

Study Period

Data were collected in August 2025.

Data Collection Tool

Data were collected using a self-administered questionnaire, developed in Google Forms and distributed via a social media chat group for intern doctors. Out of 78 invited participants, 58 completed the questionnaire (response rate 74.4%). The questionnaire. The methods used in this study were adapted from multiple previously published scientific studies [7–9]. Relevant items were selected and modified to suit the context and objectives of the current research, ensuring that the tool appropriately captured students' attitudes, knowledge, and perceived barriers related to scientific research.

The questionnaire was structured into four distinct sections designed to capture demographic information, assess knowledge, and evaluate attitudes toward medical research. The first section focused on personal data, including age, sex, prior training in research methodology, contributions to research projects, and publication history. The second section measured knowledge about medical research through fifteen multiple-choice questions. Each correct response was awarded one point, whereas incorrect or "don't know" answers received zero. The cumulative knowledge score ranged from zero to fifteen and was classified into three categories: poor knowledge (<7.5), moderate knowledge (7.5–11.25), and good knowledge (> 11.25). For this section, the mean and standard deviation (SD) of the total scores were calculated to provide a measure of central tendency and variability. The third section assessed attitudes toward medical research using eleven statements rated on a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). The total attitude score could vary between eleven and fifty-five, with scores categorized into negative attitude (11–25), neutral attitude (26–40), and positive attitude (41–55). These cut-off points were determined by dividing the possible score range into three equal segments. As with the knowledge section, the mean and SD of the total attitude scores were computed to summarize the distribution of responses. The final section of the questionnaire explored barriers to participation in medical research. In this part, participants were asked to identify and describe the factors that hindered their involvement in research-related activities. The responses were treated as qualitative data, allowing for the exploration of themes and patterns rather than numerical scoring. This approach facilitated a deeper understanding of the contextual and experiential challenges faced by participants, highlighting the practical and perceptual obstacles that may limit engagement in medical research.

Data Analysis

All data were coded and entered into a statistical software package (e.g., SPSS, version 25.0). Descriptive statistics, including frequencies and percentages, were used to describe the demographic characteristics of the participants. Continuous variables such as the total knowledge and attitude scores were summarized using means and standard deviations. Inferential statistics, such as Chi-square tests, independent sample t-tests, or Analysis of Variance (ANOVA), were utilized to compare the categorized attitude levels across different groups (e.g., by gender, age group, or medical specialty). A p-value of less than 0.05 was considered statistically significant.

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Study Setting and Participants

This study was conducted at the Faculty of Medicine, Misurata University, Libya, and focused on intern doctors who had recently commenced their internship training at the institution. Only interns who completed the questionnaire and provided consent were included. Interns who were unavailable during the data collection period or who declined participation were excluded. These inclusion and exclusion criteria ensured that the study population was representative of the intended cohort and comprised only those individuals who actively engaged in the research process.

Sample Size and Sampling Method

A total of 78 intern doctors were invited to participate in the study through an online questionnaire developed in Google Forms and shared with the interns. Of these, 58 participants completed the questionnaire in full and were included in the final analysis with a response rate of 74.4%. A convenience sampling technique was employed, targeting intern doctors who were accessible during the study period and considered relevant to the research objectives. This approach was chosen due to the practicality of online distribution and the ability to reach participants efficiently within a limited timeframe.

Ethical Considerations

Consent was obtained from the target group (intern students) before data collection, with guarantees of confidentiality and the anonymization of all participants and submitted information.

Results

Distribution of age and gender

Participants' ages ranged between 24 and 34 years, with a mean of 25 years (±1.44). The number of males participating in the study was 18 (31%), while the number of females was 40 (69%).

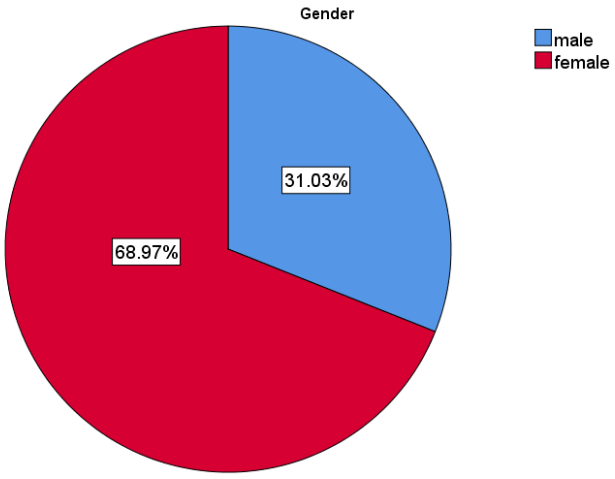

Figure 1. Distribution of participants according to gender.

The number of participants who had previous training on Research Methodology (RM) was 9 (15.5%), the number of those who had previous contribution to a research project was 9 (15.5%), while those who had previous conference participation or publication were 5 (8.6%).

Table 1. Distribution of participants according to their past research experience.

Variable		Frequency	%
Have you ever had training on RM?	No	49	84.5
	Yes	9	15.5
Previous contribution to the research project	No	49	84.5
	Yes	9	15.5
Previous conference participation	No	53	91.4
	Yes	5	8.6

The number of participants who considered scientific research important for their future career as physicians was 53 (91.4%), while those who did not consider it important were 5 (8.6%).

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Mean of knowledge score

The mean knowledge score among participants was 6.88 ± 2.82 (N=58), indicating generally poor knowledge. More than half of the participants (51.7%) demonstrated a poor knowledge level, while 43.1% had a moderate level, and only a small proportion (5.2%) achieved a good knowledge level.

Table 2. Knowledge score ranking of participants.

Knowledge level	Frequency	Percentage
Poor	30	51.7%
Moderate	25	43.1%
Good	3	5.2%
Total	**58**	**100.0%**

The following table shows the frequency and percentage for each knowledge score question.

Table 3. Number and percentage of participants who gave the right answers for each knowledge question.

Question	No. of right answers	%
Which of the following statements correctly describes the difference between a thesis and a dissertation?	8	13.8
What is usually the first section written in a scientific research paper?	45	77.6
A five-point scale (1–5) was used to capture participants' ratings in a questionnaire	4	6.9
What are the main sections of a scientific paper in logical order?	11	19
What is the primary purpose of the literature review in scientific research?	22	37.9
What is the primary objective of the methodology section in scientific research?	26	44.8
Which type of study provides the strongest evidence for a cause–and–effect relationship?	10	17.2
What is meant by the "null hypothesis" in scientific research?	25	43.1
What is the purpose of statistical analysis in scientific research?	37	63.8
What is the correct meaning of "confidentiality" in scientific research?	36	62.1
What does "research ethics" primarily mean?	51	87.9
Which of the following computer programs is commonly used for managing references and citations in scientific articles?	22	37.9
What is the importance of the Institutional Ethics Committee (IEC)?	39	67.2
What is the first step in the scientific research process?	33	55.9
What is the definition of an "abstract" in a scientific paper?	40	69

Mean of attitude score

The mean attitude score was 41.69 ± 7.34, which corresponds to the category of "positive attitude". More than half of the participants (55.2%) demonstrated a positive attitude toward research, while 41.4% had a neutral attitude, and only 3.4% showed a negative attitude.

Table 4. Attitude score ranking of participants.

Attitude level	Frequency	Percent
Negative	2	3.4%
Neutral	24	41.4%
Positive	32	55.2%
Total	58	100.0%

Frequency of attitude

The following table shows the frequency and percentage of positive attitudes.

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eISSN:2708-888X

Table 5. Number and percentage of participants who gave positive attitude answers for each attitude item.

Attitude item	No.	%
I believe that scientific research is very important for the development of medicine and healthcare.	54	93.1
Scientific research should be an integral part of the medical students' curriculum.	39	67.2
I believe that having research skills will enhance my understanding of clinical topics and improve my medical practice.	43	74.1
I do not see participation in scientific research as a waste of time or as conflicting with my academic studies.	40	68.9
I believe that engaging in scientific research increases my future professional and academic opportunities.	49	84.4
I have a strong interest in participating in research activities as part of my academic and professional career.	34	58.6
I feel confident in my ability to understand and critically read scientific research papers.	27	46.5
I believe that physicians should contribute to the production of scientific knowledge, not just consume it.	56	96.5
I find that the university environment encourages scientific research and student participation in it.	12	20.6
I consider scientific research an important means of developing critical thinking and problem-solving skills.	46	79.3
I am willing to put in extra effort to participate in a research project.	33	56.8

Table 6. Frequency and percentage of perceived barriers to research among participants.

Barrier	Frequency	%
Lack of time and inability to balance academic study requirements with research activities.	51	78.9
Difficulty in accessing study samples or following up with patients for data collection.	48	82.7
Lack of encouragement and support from faculty members or administration.	36	62.1
Unavailability of qualified supervisors or academic mentors for research	22	37.9
Lack of available training courses on research methodology and statistics.	43	74.1
Difficulty in accessing essential research resources (such as databases and statistical software).	44	75.9
A feeling of inadequate skills in statistical data analysis.	47	81
Fear of making mistakes or being unable to complete the research project	35	60.3
Weak scientific writing skills for publishing results.	46	79.3
Difficulty in obtaining adequate funding for research projects.	51	87.9
Insufficient personal interest in participating in research activities.	35	60.3

The number of participants who considered scientific research important for their future career as physicians was 53 (91.4%), while those who did not consider it important were 5 (8.6%).

The mean attitude score was higher among females (43.05) compared to males (38.67), with a statistically significant difference ($p = 0.034$). In contrast, although males had a higher mean knowledge score (7.92) compared to females (6.41), this difference was not statistically significant ($p = 0.096$). The mean attitude score was higher among participants who had prior RM training (46.33) compared to those who did not (40.84), with a statistically significant difference ($p = 0.038$). On the other hand, although participants with RM training had a higher mean knowledge score (7.94) compared to those without training (6.68), this difference was not statistically significant ($p = 0.218$). The mean attitude score was higher among participants who had contributed to a research project (46.33) compared to those who had not (40.84), with a statistically significant difference ($p = 0.038$). In contrast, although participants with research project

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experience had a higher mean knowledge score (7.28) compared to those without experience (6.80), this difference was not statistically significant (p = 0.645).
The mean attitude score was higher among participants who had published research or conference participation (47.80) compared to those who did not (41.11), with the difference approaching statistical significance (p = 0.051). On the other hand, although participants with research or conference experience had a higher mean knowledge score (7.90) compared to those without experience (6.78), this difference was not statistically significant (p = 0.399).

Table 7. Inferential statistics between independent variables and attitude and knowledge scores

Variable	Group	Attitude		Knowledge	
		Mean (SD)	p-value	Mean (SD)	p-value
Gender	Male	38.67 (8.7)	0.034	7.92 (3.0)	0.096
	Female	43.05 (6.3)		6.41 (2.6)	
Prior RM Training	No	40.84 (7.3)	0.038	6.68 (2.9)	0.218
	Yes	46.33 (5.6)		7.94 (2.2)	
Contribution to Research Project	No	40.84 (7.3)	0.038	6.80 (2.8)	0.645
	Yes	46.33 (5.5)		7.28 (3.0)	
Published Research/Conference Participation	No	41.11 (7.3)	0.051	6.78 (2.9)	0.399
	Yes	47.80 (5.2)		7.90 (1.4)	

Discussion

The overall knowledge level of intern doctors was low, with more than half of the participants classified as having poor knowledge and only a small minority demonstrating good knowledge. This indicates that medical school training may not adequately prepare interns with essential research skills.
Despite the generally poor knowledge, the majority of interns expressed a positive attitude toward medical research, suggesting that they value the importance of research and are motivated to engage if proper opportunities and training are provided.
Female interns demonstrated significantly higher attitude scores compared to males, highlighting possible gender-related differences in how research is perceived and valued. However, knowledge scores did not differ significantly by gender, suggesting that knowledge gaps are shared across both groups.
Interns who had prior training in research methodology showed significantly more positive attitudes toward research, even though their knowledge scores were not significantly higher. This suggests that short-term training may influence perceptions and attitudes more effectively than it improves measurable knowledge.
Similarly, participants who had previous research experience (projects, conferences, publications) reported more favorable attitudes, with differences approaching or reaching statistical significance. This underscores the importance of practical exposure in shaping how interns view research.
The present study demonstrated that prior training in research methods was associated with more favorable attitudes toward research, with trained participants reporting significantly higher attitude scores compared to their untrained peers. This finding is consistent with reports from Rwanda [10] and Jordan [11], where previous training and active research involvement were found to enhance students' interest, perceived value of research, and likelihood of future engagement. Similar results were noted in Saudi Arabia [12], where interns who had received training exhibited greater research productivity, further supporting the role of structured instruction in shaping positive attitudes. Studies from Iran [7] and Pakistan [13] likewise highlight the importance of workshops and mentorship in translating positive attitudes into active research participation, aligning with the trend observed here. In contrast, a study conducted in Yemen [14] found no significant effect of prior training on attitudes, suggesting that contextual factors such as the quality or duration of training may influence its impact.
In terms of knowledge, our study found that although trained students achieved slightly higher mean knowledge scores than untrained students, the difference was not statistically significant. This outcome reflects a common theme in the literature, where short-term or limited training improves attitudes but does

not always translate into measurable gains in knowledge. Similar patterns were reported in Rwanda [10] and Jordan [11], where persistent gaps in methodological and statistical understanding were observed despite generally positive attitudes. Conversely, research from Mansoura University in Egypt [15] demonstrated that prior training was associated with significantly higher knowledge, indicating that more comprehensive or sustained interventions may produce stronger effects. In Yemen [14], however, the majority of students exhibited low levels of research knowledge, and prior training did not result in significant improvement, a finding that closely mirrors the results of the current study.

Taken together, these comparisons suggest that while research training reliably enhances attitudes toward research, its impact on knowledge acquisition is less consistent and may depend on the intensity, duration, and quality of the training provided. The barriers identified in this study, including lack of time, limited mentorship, insufficient statistical skills, and restricted access to resources, also echo challenges reported across diverse settings previously mentioned [11,12]. These shared obstacles help to explain why training interventions often foster enthusiasm and motivation but fall short in producing significant knowledge gains without structural support and sustained mentorship.

The findings of this study underline the importance of integrating research methodology training into both undergraduate medical curricula and postgraduate training programs. The positive association observed between prior research training and favorable attitudes toward research suggests that structured opportunities for medical students and interns to participate in research could significantly enhance their perception, motivation, and willingness to engage in scholarly activities. Embedding such training early in medical education may contribute to cultivating a research-oriented mindset and establishing a solid foundation for evidence-based clinical practice [16].

From a professional perspective, the development of positive attitudes toward research among intern doctors is likely to increase their active participation in research projects. This engagement not only contributes to the professional growth of individual doctors but also benefits the medical community by generating new knowledge, improving clinical practices, and advancing patient care. Encouraging research participation at the internship stage could also promote lifelong learning and the integration of evidence-based medicine in daily clinical decision-making [17,18].

Study Limitations

This study has several limitations that should be acknowledged. First, the relatively small sample size may have limited the statistical power to detect differences, particularly in knowledge scores. Second, the use of a self-administered questionnaire introduces the possibility of reporting bias, as responses may reflect perceived rather than actual knowledge and attitudes. Finally, the cross-sectional design only captures a single point in time and does not allow assessment of long-term changes in knowledge or attitudes.

Recommendations for Future Research

Based on the findings of this study, several recommendations can be made for future research. First, future studies should consider recruiting a larger and more diverse sample across multiple institutions to enhance the generalizability of results. Second, while this study focused on short-term training and its immediate effects, longitudinal studies are recommended to assess the long-term retention of research knowledge and the sustainability of positive attitudes. Third, the inclusion of extended or repeated training programs, incorporating both theoretical and practical components, may provide a more comprehensive evaluation of their impact on participants' competencies.

Conclusion

Intern doctors at Faculty of Medicine- Misurata University show a strong, positive attitude toward scientific research but possess poor knowledge of research methodology. Prior exposure to research, such as training and project contribution, is essential for fostering positive attitudes. Recommendations include integrating structured, practical research training into both undergraduate and postgraduate curricula to bridge the significant knowledge gap and address perceived barriers.

Conflict of interest. Nil

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