Republic of Yemen
Ministry of Higher Education and Scientific Research
21 SEPTEMBER UNIVERSITY
FACULTY OF MEDICINE

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
جامعة ٢١ سبتمبر للعلوم الطبية والتطبيقية
كلية الطب البشري
FACULTY OF MEDICINE

Knowledge, Attitude, and Barriers Towards Medical Research Among Medical Students in 21september university

Research Project to Fulfill Part Requirement for the bachelor's degree in Medical Bachelor and Bachelor of Surgery (MBBS).

Conducted by:

1. Abdulmalik Ahmed Ahmed Al-moayad
2. Aseel Ebrahim Ahmad Al-saadi
3. Amal Abdo Hussein Ajlan
4. Anwar Mohammed Abdullah Saleh Al-maeti
5. Arkan Anwar Abdullah Othman Al-hmmadi
6. Ashraf Saleh Yahya Al-khatar
7. Badee adel Rubaid
8. Esmail Ebrahim Abdo Taher Abdulmughni
9. Jamal Abdulhamied Nasser Al-kumaim
10. Hamza Abdulbaset Abdullah Al-masany
11. Salman Saleh Mohsen Al-falahi
12. Shamsan Hussein Yahya Jaffer

Department supervisor:

Dr. Nora Noraldeen

Community medicine supervisor:

Dr. Rola TaherShaher

2022-2023

ABSTRACT

***Introduction**:* The role of research in healthcare is crucial for improving health outcomes, and medical students must develop the knowledge and skills to conduct research. However, medical students face numerous barriers that hinder their research progress.

Background and Objectives: Standard methods are used to achieve new knowledge through research, which is defined as "a systematic collection of data that uses disciplined methods to answer questions or solve problems." In the context of health, research is a core and fundamental component of improving the health of a community. Therefore, it is essential that healthcare providers, especially doctors, possess adequate knowledge and skills to conduct research. The objective of this study is to assess the knowledge, attitude, and barriers toward research among medical students at 21 September University in Yemen. Specific objectives include identifying the attitudes and level of knowledge of medical students toward medical research, identifying perceived barriers to medical research, and exploring variations in responses based on gender, age, and faculty of study.

Results: The study found that the majority of medical students at 21 September University in Yemen had a positive attitude toward medical research and felt that it was important for their future careers. However, there were also significant barriers to conducting research, including a lack of research facilities and funding, and limited research skills among students. Significant variations were observed in attitudes, knowledge, and barriers toward research based on gender, age, and college affiliation. The findings suggest a need for targeted interventions to address these barriers and improve research capacity among medical students in Yemen.

Conclusion: The study found that the majority of medical students at 21 September University have positive attitudes towards research, recognizing its importance in developing critical thinking skills and improving medical care. Many students expressed motivation and interest in conducting research, with a high percentage agreeing on the need to involve undergraduate students in research. However, there were also obstacles identified, such as insufficient training and lack of time due to academic and extracurricular activities. The study suggests the importance of providing more training and support for students in conducting medical research, especially for undergraduate students.

Overall, medical research is considered an essential part of medicine, and promoting its development among students can help achieve the desired goals of the medical field.

CHAPTER 1

INTRODUCTION

Research is a systematic collection of data that employs disciplined methods to answer questions or solve problems. In the context of healthcare, research plays a crucial role in improving the health of communities, contributing to the prevention, diagnosis, and treatment of diseases, and informing the development of better healthcare policies [1]. Therefore, healthcare providers, especially medical doctors, must possess the knowledge and skills to conduct research to improve their critical thinking and reasoning abilities and enhance their professional practice [2]. Understanding and applying the scientific method is an essential component of medical work [3]. Thus, it is imperative that medical students develop a positive attitude towards scientific research early in their careers [4].

While medical students are highly motivated to pursue research, they often face numerous barriers that impede their research progress. These barriers can stem from personal failure, organizational mismanagement, economic deprivation, and even societal attitudes towards research [5]. Potential research barriers include a lack of encouragement and guidance from research mentors, inadequate research facilities and literature resources, a strong curricular emphasis, insufficient funding, limited impact on society, and generally negative attitudes towards young researchers by their supervisors [6-8].

Therefore, to overcome these barriers, it is essential to understand medical students' knowledge, attitudes, and the barriers that they face towards medical research. An understanding of these factors can help address the obstacles that students face and develop solutions to encourage and facilitate their engagement in medical research.

This study aims to explore the knowledge, attitudes, and barriers towards medical research among medical students. It will provide insight into the factors that influence medical students' engagement in research and help identify strategies to promote research as an integral component of medical education. The findings of this study will be relevant to educators and policymakers who aim to enhance medical students' research skills and abilities.

1.1 Background

Standard methods use for achieve new knowledge as process for research, simply research can be defined as "a systematic collection of data that uses disciplined methods to answer questions or solve problems".

In the context of health, research is a core and fundamental component of improving the health of a community [10], It helps in the prevention, diagnosis and improves treatment of diseases and, thus has significant impact on development of better healthcare policies. It is essential that healthcare providers especially doctors, possess adequate knowledge and skill of conducting research, as it plays crucial role in developing critical thinking and reasoning skills of a health professional [11]. Therefore, understanding and applying the scientific method is an important part of medical work [12]. Students must develop a positive attitude towards scientific research from the very beginning of their medical career [13]. Research shows that while students are highly motivated to pursue research, they are held back by a number of barriers [14]. These barriers are caused by personal failure, organizational mismanagement, economic deprivation, and even society s general attitude toward research [15]. Lack of encouragement and guidance from mentors in research, lack of facilities and literature resources, strong curricula [16, 17], lack of funding [18], little real impact on society [19] and generally negative attitudes towards young researchers by their supervisors [20, 21], were identified as potential research barriers.

1.2 Statement of the Problem:

Despite the importance of research in healthcare, medical students in Yemen face numerous barriers to conducting research, including a lack of resources, limited research skills, and competing academic demands. As a result, medical research in Yemen is underdeveloped, and there is a significant need for capacity building in this area. Understanding the attitudes, knowledge, and barriers toward research among medical students is essential for identifying the underlying factors that contribute to these challenges and developing targeted interventions to address them.

1.3 Justification of the Study:

Research is an essential component of healthcare, and medical students need to acquire the knowledge and skills to conduct research to improve health outcomes. However, there is a significant gap in the literature on the knowledge, attitudes, and barriers toward research among medical students in Yemen. The current study aims to fill this gap by examining these factors among medical students at 21 September University in Yemen. This study is justified by several reasons. Firstly, it can contribute to the existing body of knowledge on the subject by identifying the challenges that students face in conducting research and proposing targeted interventions to address these challenges. Secondly, it can inform medical education policymakers in Yemen about the importance of promoting research culture among medical students and the need to provide them with the necessary resources and training to conduct research. Thirdly, it can enhance the research capacity of medical students, which can lead to improved health outcomes and innovative solutions to healthcare problems in Yemen. Therefore, this study can have significant implications for medical education and healthcare in Yemen and can serve as a foundation for future research on the subject.

1.4 Literature reviews

In evaluating previous related literatures which report that medical students' involvement in research projects has declined in recent years [22,23]. In 2006, Silcox showed that 75% of the postgraduate students prefer to engage in other scholarly activities compared to the research [24]. Studies have verified that medical students' involvement in research is highly associated with postgraduate research works [25,26]. According to a recent study in Iran in 2012, 70% of medical sciences students are not willing to do research due to barriers and challenges in the research [27].

In the kingdom of Saudi Arabia, some authors attempted to find the perceptions, barriers towards research among university students. Findings from the study conducted in 2012 by Amin et al., [28] revealed attitude scores that were moderately high in terms of research but scores about knowledge were relatively low.

In developing countries like Yemen, medical school curricula mainly focus on clinical medicine and the development of practical skills, prioritizing them over research activities. Because of that students face more obstacles in conducting research projects than their peers in

developed countries. A review of related literature shows that there exists only two study related to the attitudes, practices, and barriers regarding medical research for Yemeni medical students [29-30]. Therefore, this study aimed to address the research gap by conducting a survey among medical students at the Faculty of Medicine in, 21 September University.

1.5 Study objective

1.5.1 General objective:

To assess the knowledge, attitude and barriers toward research among medical student in 21 September University in Yemen.

1.5.2 Specific objectives:

1. To identify the attitudes of medical students at 21 September University towards medical research.
2. To assess the level of knowledge of medical students at 21 September University in the field of medical research.
3. To identify the barriers to medical research perceived by medical students.
4. To examine the relationship between the attitudes of medical students towards medical research and their gender.
5. To explore the variations in medical students' responses to attitudes, knowledge, and barriers towards medical research based on gender.
6. To investigate the variations in medical students' responses to attitudes, knowledge, and barriers towards medical research based on age.
7. To investigate the variations in medical students' responses to attitudes, knowledge, and barriers towards medical research based on the faculty of study.

CHAPTER 2
MATERIALS AND METHODOLOGY

2.1 Study design:

A Cross-sectional survey was employed among medical students in the faculty of medicine and health sciences ,21 September University between Jun and Feb of 2023.

2.2 Population:

This study involved all the students, males and female, in 21st September University who are in their last level in four different colleges: medical college, clinical pharmacy college, nursing college and laboratory college. The total number of students in their last academic year is 831.

2.3 Sample size:

The sample of students was chosen random stratified method so as to include all the categories of students, both genders, different colleges and all categories of Ages where the sample size chosen was about 52% which represents a number of 432 students.

2.4 Data collection:

For the purpose of data collection, a questionnaire was used consisted of four parts. First part, collects demographic Performa to collect personal data, while the other three parts involved many closed questions with five options , which are: strongly disagree, disagree ,neutral , agree , strongly agree , which measure the score of agreement toward the three parts the questionnaire centered on which are attitude , knowledge ,and barriers toward medical research.

2.5 Data analysis:

After the responses of the questionnaire were collected, it was filled using Microsoft Excel 365, then coded using SPSS version 24 and analyzed using many statistical measures, such as frequency distribution and percentages; in addition, a collection of statistical methods were used such as correlation factors, Mann-Whitney test, and Kruskal Wallis Test.

2.6 Work Plan

	Activity	Time Period			
		2022	2023		
		Dec	Jan	Feb	Mar
1.	Finalize the research proposal				
2.	Finalize questionnaire and checklists				
3.	Earn ethical clearance				
4.	Training of data collectors				
6.	Data collection				
7.	Data entry and data cleaning				
8.	Data analysis				
9.	Writing a study report				
10.	Finalizing report				
11.	Result dissemination				

CHAPTER 3
RESULTS AND DATA ANALYSIS

Results and data analysis were taken up through systematical and logical techniques (SPSS version 24) after the accomplishment of data collection process. Table 1.

A total of 432 students 322 (74.5 %) male and 110 (25.5%) females respectively were included in this study. Overall response rate is 100.0 percent. The student's response age group is 72% are they are in between 20- 25 years of age. 25.9% of students age group is 26-30 year of age. The least amount in the students ages is more than 30 years.

The sample of the students were taken from four colleges where the highest percentage of respondents was 60% from medical college, then comes clinical pharmacy college with a percentage of 18.8%. On other hand, the colleges with the lowest percentage of respondents were nursing college and laboratory college with percentages of 11.8 and 9.5, respectively.

Table 1 Showing the social demographic Characteristics.

Variable	demographic characteristics	Frequency	Percent (%)
Age	20-25	311	**72.0**
	26-30	112	**25.9**
	above 30	9	**2.1**
	Total	432	**100.0**
Gender	Male	322	**74.5**
	Female	110	**25.5**
	Total	432	**100.0**
College	Medical	259	**60.0**
	Clinical Pharmacy	81	**18.8**
	Laboratory	41	**9.5**
	Nursing	51	**11.8**
	Total	432	**100.0**

3.1 Attitude of respondents toward Medical research

Importance of research (attitude):

To identify the students' attitudes toward medical research, the frequencies and percentages were extracted for each question in the attitude part of the questionnaire as shown in table 2.

Table 2 Frequency and percentage distribution of respondent's attitude toward medical research

responses / Statements	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	F	%	F	%	F	%	F	%	F	%
Promotes critical thinking	20	4.6	15	3.5	90	20.8	209	48.4	98	22.7
Improves patient's care	16	3.7	23	5.3	61	14.1	197	45.6	135	31.3
Research will help one's clinical practice later	20	4.6	25	5.8	47	10.9	194	44.9	146	33.8
Helps to changes health policy	19	4.4	22	5.1	56	13	227	52.5	108	25
Undergraduate students should participate in clinical research projects	17	3.9	32	7.4	70	16.2	194	44.9	119	27.5
It is an extra burden to do research	32	7.4	93	21.5	126	29.2	135	31.3	46	10.6
You have self-interest and motivation for research	26	6	32	7.4	110	25.5	185	42.8	79	18.3

From Table 2, the results show that 48.4% agreed that medical research promotes critical thinking; moreover, 22.7% strongly agreed on that. On the other hand, a small percentage of 3.5% disagreed, in addition, 4.6% of the students strongly disagreed. The rest with percentage of 20.8% did not demonstrate an opinion toward that.

A percentage of 45.6% agreed that medical research improves patient's care; moreover, 31.3% strongly agreed on that. On the other hand, a small percentage of 5.3% disagreed, in addition, 3.7% of the students strongly disagreed. The rest with percentage of 14.1% did not demonstrate an opinion toward that.

Students with percentages 44.9% and 33.8% demonstrated agreement and strong agreement, respectively, with the claim that research would help with one's clinical practice. On the other hand, a small percentage of 5.8% and 4.6% of students disagreed and strongly

disagreed, respectively. The rest with percentage of 10.9% were neutral in attitude.

Students with percentages 52.5% and 25% demonstrated agreement and strong agreement, respectively, with the claim that research helps to changes health policy. On the other hand, a small percentage of 5.1% and 4.4% of students disagreed and strongly disagreed, respectively. The rest with percentage of 13% were neutral in attitude.

For the question whether undergraduate students should participate in clinical research projects or not. A percentage of 44.9% showed agreement, in addition to, 27.5% showed strong agreement with that. In contrast, 7.4% disagreed and 3.9% strongly disagreed. A percentage of 16.2 showed no opinion.

For the question whether it is an extra burden to do research or not. A percentage of 31.3% showed agreement, in addition to, 10.3% showed strong agreement with that. In contrast, 21.5% disagreed and 7.4% strongly disagreed. A percentage of 29.2 showed no opinion.

Finally, students with percentages 42.8% and 18.3% demonstrated agreement and strong agreement, respectively, whether they have self-interest and motivation for research while the other showed no interest in that.

The figures below demonstrate the responses of the students in each attitude from the above:

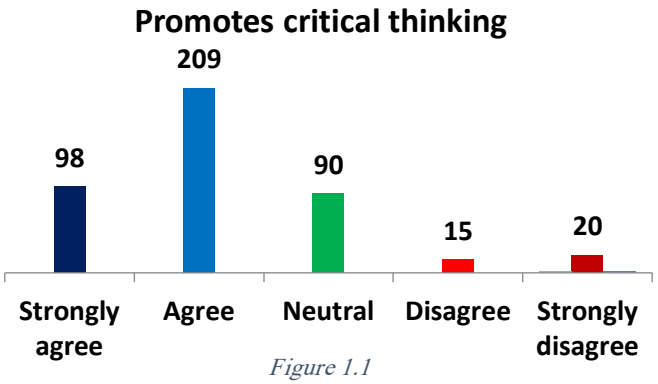

Figure 1.1

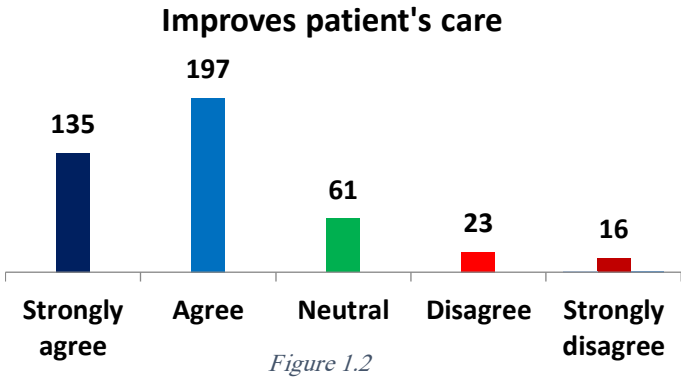

Figure 1.2

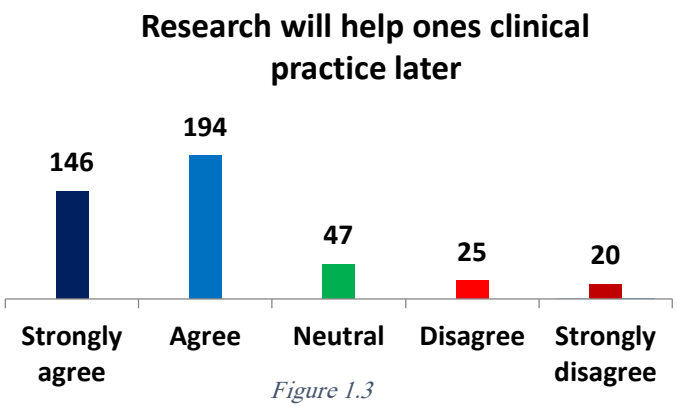

Figure 1.3

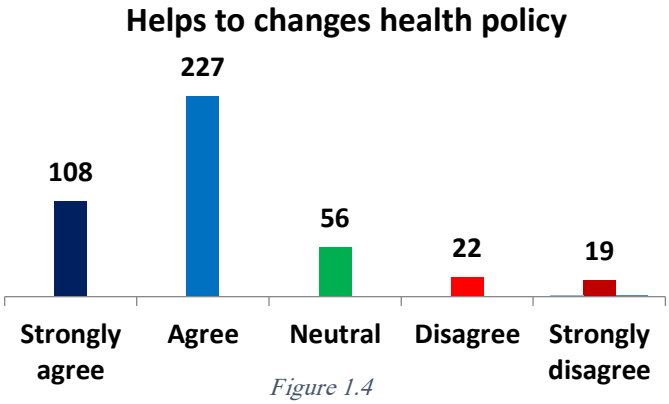

Figure 1.4

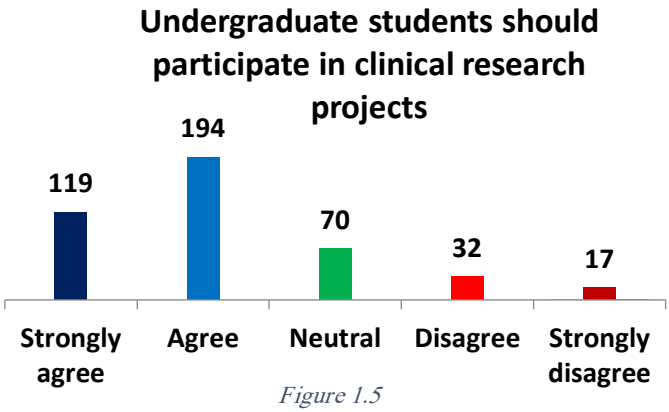

Figure 1.5

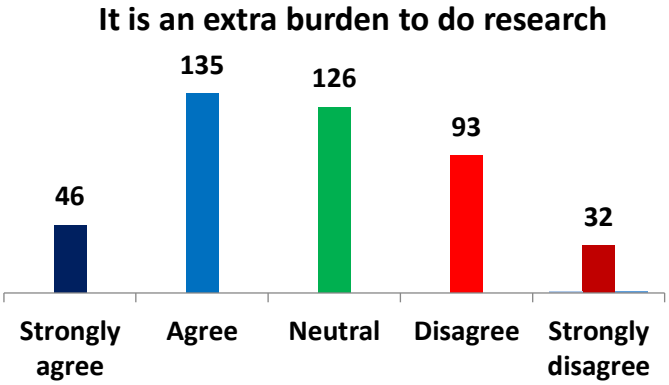

Figure 1.6

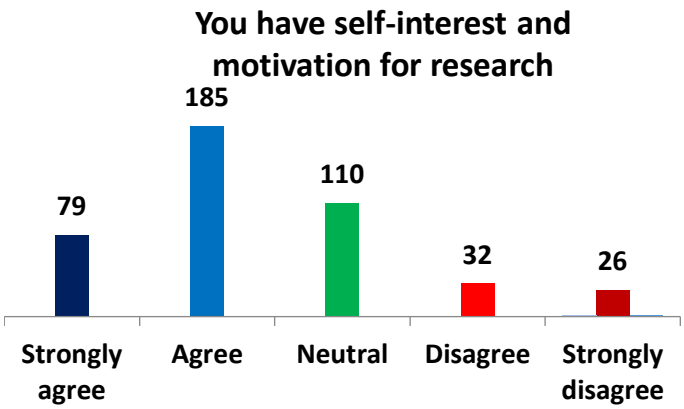

Figure 1.7

3.2 Knowledge of respondents toward research obstacles related to the student (knowledge):

In order to identify the students' knowledge toward medical research, the frequencies and percentages were extracted for each question in the attitude part of the questionnaire as shown in table 3.

Table 3 Frequency and percentage distribution of respondents' knowledge toward medical research

responses / Statements	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	F	%	F	%	F	%	F	%	F	%
You are aware of research methodology	18	4.2	60	13.9	118	27.3	198	45.8	38	8.8
You can formulate a research protocol	27	6.3	82	19	115	26.6	179	41.4	29	6.7
You can evaluate a scientific literature	29	6.7	77	17.8	126	29.2	168	38.9	32	7.4
You can perform simple statistical analysis	46	10.6	106	24.5	116	26.9	137	31.7	27	6.3
You can write a research paper	41	9.5	83	19.2	115	26.6	114	33.3	49	11.3

From Table 3, it is evident that the first point ("You are familiar with research methodology") has the highest agreement rate, with 45.8% of the students agreeing to their knowledge of research methodology, and 8.8% strongly agreeing with this statement. This means that more than half of the students are familiar with research methodology, while the rest of the students showed either a lack of knowledge of research methodology or neutrality, with a 13.9% disagreement rate and 4.2% strongly disagreeing, and 27.3% being neutral.

The second point ("You can formulate a research protocol") ranked second in terms of respondents' knowledge, with a proportion of 41.4% and 6.7% agreeing and strongly agreeing with this statement, respectively. This means that only about 48% of the students are capable of formulating a research protocol, while more than 50% of the students

are not able to formulate a research protocol or did not show their knowledge by answering this statement neutrally.

The third point ("You can evaluate scientific literature") ranked third in terms of respondents' knowledge, with a proportion of 38.9% and 7.4% agreeing and strongly agreeing with their ability to evaluate scientific literature, respectively, and a proportion of 17.8% and 6.7% disagreeing and strongly disagreeing with their ability to evaluate scientific literature. The remaining students showed neutrality towards this point. The fourth and fifth points ("You can write a research paper" and "You can perform basic statistical analysis") ranked fourth and fifth in terms of students' knowledge of research, with a proportion of 44.6% and 38% agreeing or strongly agreeing with their ability to write a research paper and perform basic statistical analysis, respectively.

The figures below demonstrate the responses of the students in each knowledge from the above:

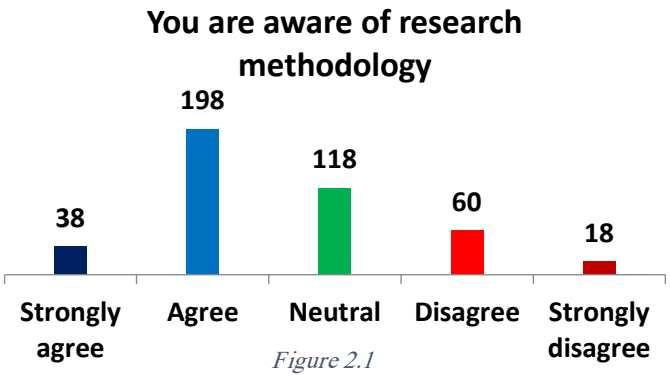

Figure 2.1

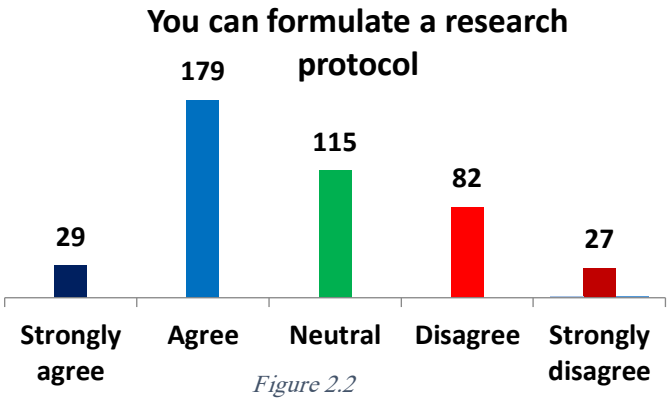

Figure 2.2

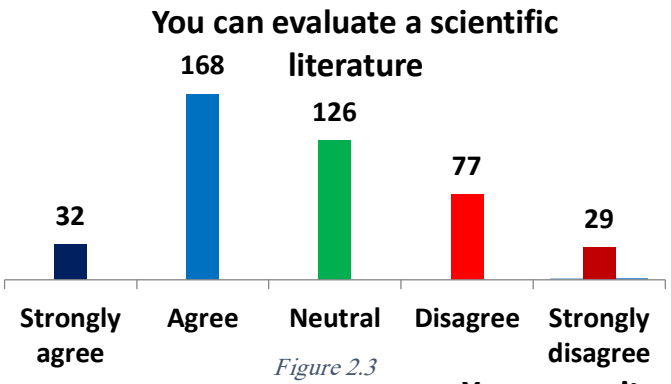

Figure 2.3

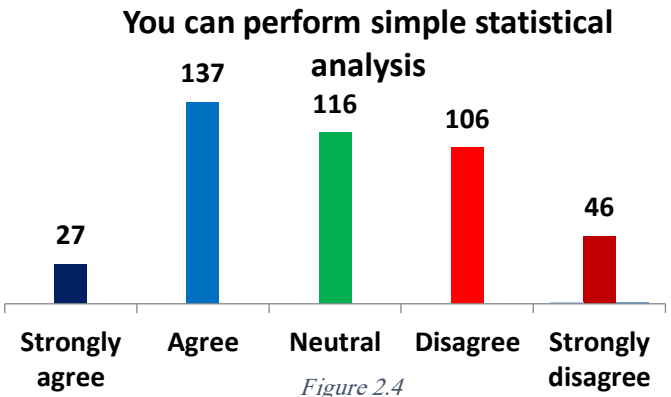

Figure 2.4

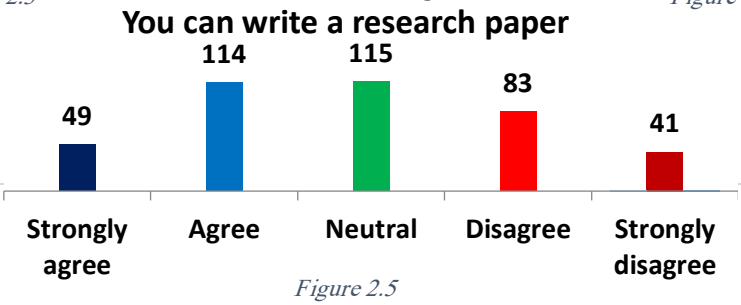

Figure 2.5

3.3 Barriers to research

Obstacles related to the college:

It is evident from the above table that the point (Lack of time due to overburden with other educational activities) had the highest percentage of agreement from students with a total of (44.9%, 23.8%) agreement and strong agreement, meaning that more than 68% see time constraints, heavy burdens, and other educational activities as the most significant research obstacles. In second place, the point Priority is given to other educational activities by the university than research) was ranked second in terms of student agreement as one of the most research obstacles, with a percentage of students who agreed and strongly agreed at (40.5%, 18.5%) which is 59% of students who consider this point as an obstacle to research.

Table 4 Frequency and percentage distribution of respondents barriers toward medical researcz

responses / Statements	Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	F	%	F	%	F	%	F	%	F	%
There is allotted time to pursue research	51	11.8	93	21.5	121	28.0	137	31.7	30	6.9
There is adequate training in research methodology	80	18.5	123	28.5	103	23.8	99	22.9	27	6.3
"There are adequate facilities for research (internet, and journals)"	45	10.4	97	22.5	90	20.8	154	35.6	46	10.6
There are enough rewards/motivations to participate in research	61	14.1	137	31.7	119	27.5	90	20.8	25	5.8
There is adequate training on how to write a manuscript	69	16.0	152	35.2	101	23.4	89	20.6	21	4.9
There is adequate training on how to perform simple statistical analysis	63	14.6	147	34.0	100	23.1	98	22.7	24	5.6
Research mentors are easily available	65	15.0	164	38.0	96	22.2	86	19.9	21	4.9
It is easy to obtain approval for conducting a research from college	36	8.3	116	27.1	123	28.7	129	30.1	24	5.6
Lack of time due to overburden with other educational activities	23	5.3	38	8.8	74	17.1	194	44.9	103	23.8
Priority is given to other educational activities by the university than research	25	5.8	56	13	96	22.2	175	40.5	80	18.5
Lack of good research ideas	31	7.2	82	19.0	109	25.2	165	38.2	45	10.4

The point (Research mentors are easily available) and the point (There is adequate training on how to write a manuscript) and the point (There is adequate training in research methodology) were ranked fourth, fifth, and sixth, respectively, through a percentage of (53%, 51.2%, 48.6%) who disagreed or strongly disagreed with their availability. Thus, they represent obstacles that students see as essential to facilitate their ability to conduct research in the medical field, increase their positive attitudes, and strengthen their knowledge in medical research.

The figures below demonstrate the responses of the students in each barrier from the above:

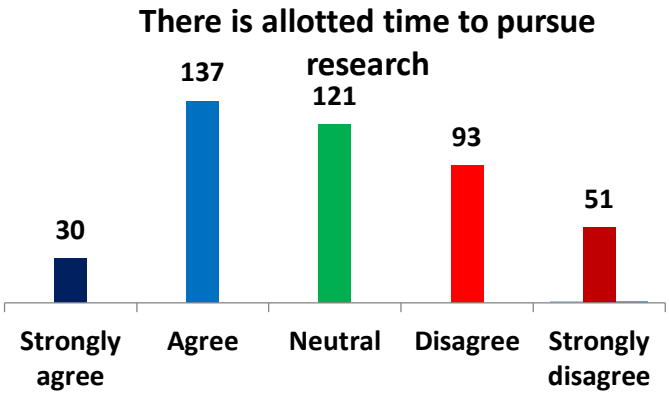

Figure 3.1

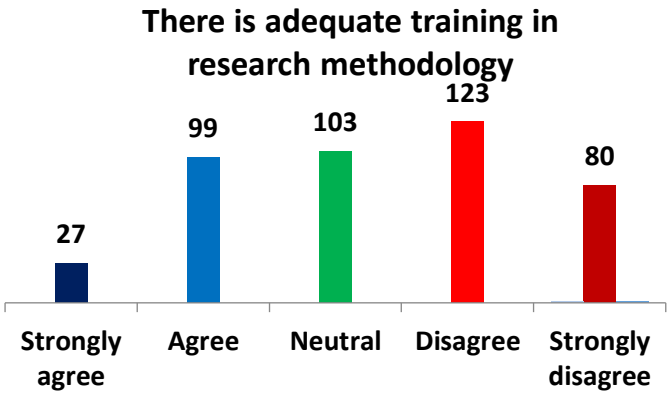

Figure 3.2

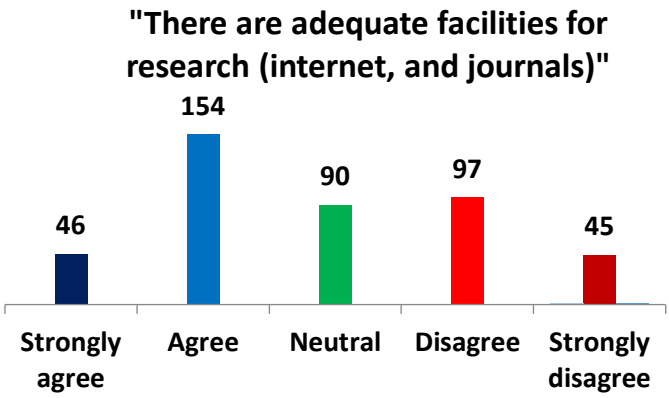

Figure 3.3

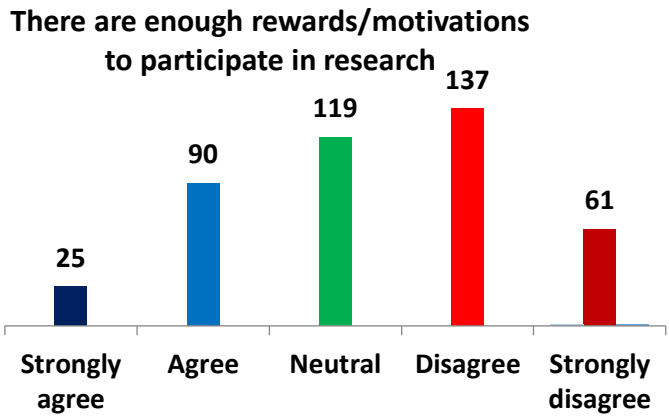

Figure 3.4

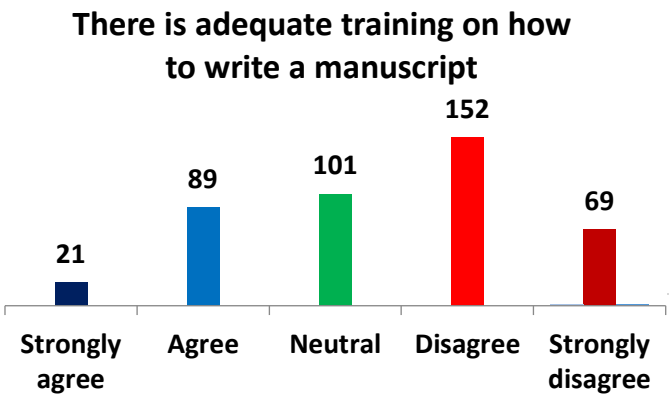

Figure 3.5

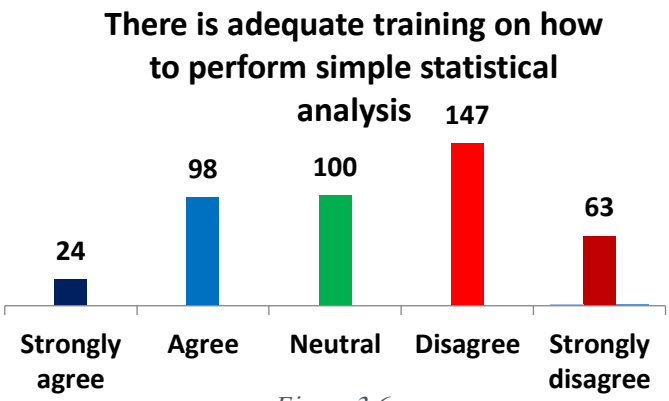

Figure 3.6

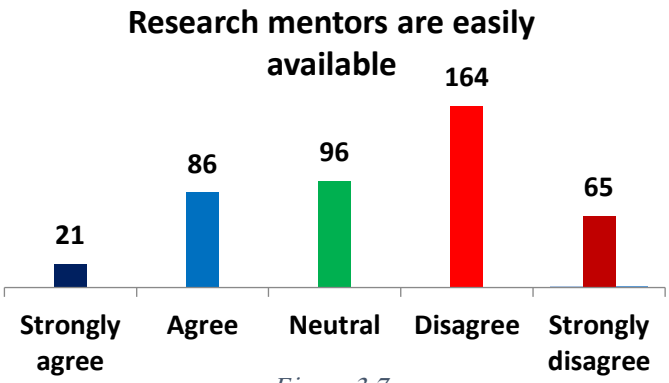

Figure 3.7

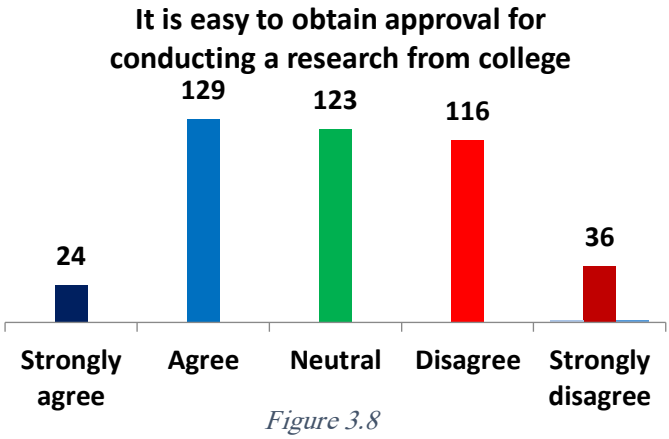

Figure 3.8

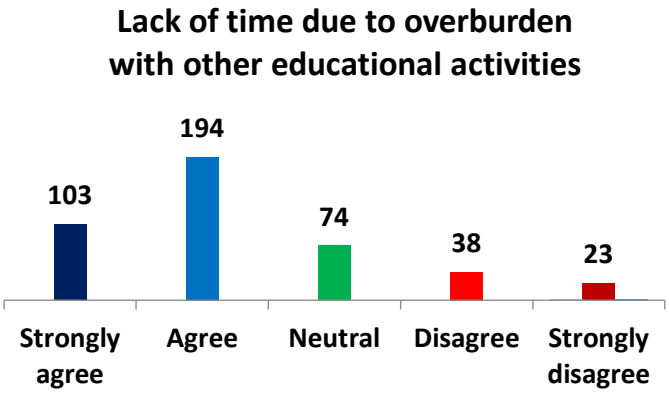

Figure 3.9

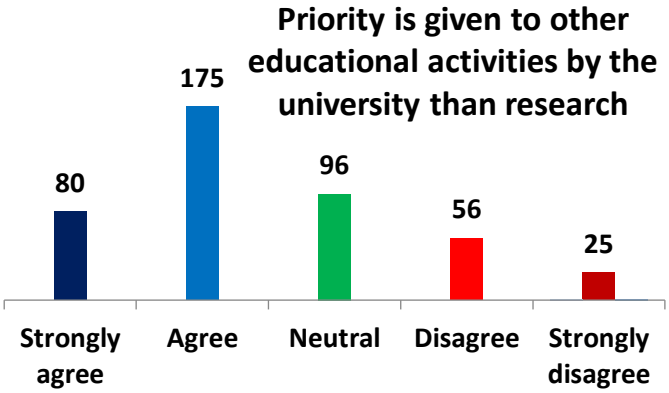

Figure 3.10

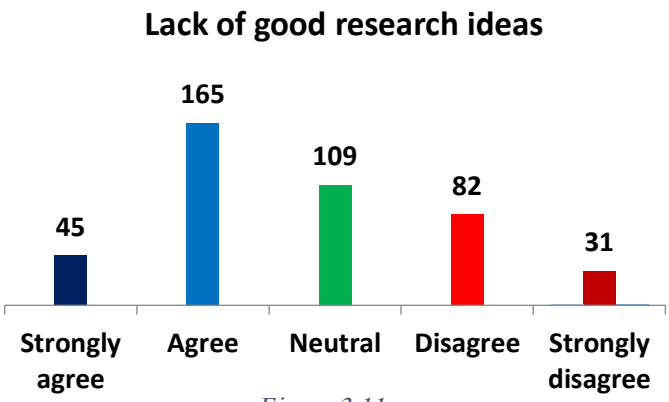

Figure 3.11

3.4 Association of Level of Attitude with Selected Demographic Variables

a) To examine the relationship between gender (male, female), the frequencies and percentages of student responses were extracted for each point in the survey's scenarios. Then, the correlation coefficient between the student's gender and their responses in each point was calculated, as shown in Table 5.

Table 5 Association of Level of Attitude with Gender

Statements	Gender	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		P-value
		F	%	F	%	F	%	F	%	F	%	
Promotes critical thinking	male	14	3 %	13	3%	73	17 %	147	34 %	75	17 %	0.233
	Female	6	1 %	2	0%	17	4%	62	14 %	23	5%	
Improves patient's care	male	13	3 %	14	3%	50	12 %	144	33 %	101	23 %	0.326
	Female	3	1 %	9	2%	11	3%	53	12 %	34	8%	
Research will help one's clinical practice later	male	16	4 %	20	5%	40	9%	141	33 %	105	24 %	0.36
	Female	4	1 %	5	1%	7	2%	53	12 %	41	9%	
Helps to changes health policy	male	15	3 %	18	4%	47	11 %	163	38 %	79	18 %	0.353
	Female	4	1 %	4	1%	9	2%	64	15 %	29	7%	
Undergraduate students should participate in clinical research projects	male	14	3 %	24	6%	54	13 %	144	33 %	86	20 %	0.889
	Female	3	1 %	8	2%	16	4%	50	12 %	33	8%	
It is an extra burden to do research	male	26	6 %	67	16 %	94	22 %	107	25 %	28	6%	0.127
	Female	6	1 %	26	6%	32	7%	28	6%	18	4%	
You have self-interest and motivation for research	male	23	5 %	25	6%	82	19 %	135	31 %	57	13 %	0.50
	Female	3	1 %	7	2%	28	6%	50	12 %	22	5%	

Table 5 indicates that the significance level value is greater than 0.05 in all scenarios, meaning that there is no relationship between the

gender variable and the scenario variable in all seven scenarios included in the survey.

b) To identify the relationship between each academic variable and students' attitudes towards research, the frequencies and percentages of responses were extracted for each statement of attitudes towards research according to the students' academic college. Then, the correlation coefficient between the academic variable and their responses to all statements was calculated, as shown in Table 6

Table 6 Association of Level of Attitude with College

Statements	College	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		P-value
		F	%	F	%	F	%	F	%	F	%	
Promotes critical thinking	Medical	7	1.6 %	5	1.2%	47	10.9 %	137	31.7 %	63	14.6 %	0.003
	Clinical Pharmacy	6	1.4 %	2	0.5%	26	6.0%	37	8.6%	10	2.3%	
	Laboratory	3	0.7 %	3	0.7%	6	1.4%	17	3.9%	12	2.8%	
	Nursing	4	0.9 %	5	1.2%	11	2.5%	18	4.2%	13	3.0%	
Improves patient's care	Medical	5	1.2 %	12	2.8%	36	8.3%	121	28.0 %	85	19.7 %	0.090
	Clinical Pharmacy	3	0.7 %	4	0.9%	10	2.3%	40	9.3%	24	5.6%	
	Laboratory	2	0.5 %	5	1.2%	7	1.6%	18	4.2%	9	2.1%	
	Nursing	6	1.4 %	2	0.5%	8	1.9%	18	4.2%	17	3.9%	
Research will help one's clinical practice later	Medical	11	2.5 %	11	2.5%	27	6.3%	114	26.4 %	96	22.2 %	0.866
	Clinical Pharmacy	5	1.2 %	7	1.6%	8	1.9%	38	8.8%	23	5.3%	
	Laboratory	2	0.5 %	3	0.7%	6	1.4%	20	4.6%	10	2.3%	
	Nursing	2	0.5 %	4	0.9%	6	1.4%	22	5.1%	17	3.9%	
Helps to changes health policy	Medical	5	1.2 %	9	2.1%	28	6.5%	151	35.0 %	66	15.3 %	0.002
	Clinical Pharmacy	8	1.9 %	3	0.7%	15	3.5%	35	8.1%	20	4.6%	
	Laboratory	3	0.7 %	3	0.7%	7	1.6%	22	5.1%	6	1.4%	
	Nursing	3	0.7 %	7	1.6%	6	1.4%	19	4.4%	16	3.7%	
Undergraduate students should participate in clinical research projects	Medical	7	1.6 %	15	3.5%	39	9.0%	125	28.9 %	73	16.9 %	0.154
	Clinical Pharmacy	5	1.2 %	4	0.9%	16	3.7%	31	7.2%	25	5.8%	
	Laboratory	3	0.7 %	7	1.6%	7	1.6%	18	4.2%	6	1.4%	
	Nursing	2	0.5 %	6	1.4%	8	1.9%	20	4.6%	15	3.5%	

It is an extra burden to do research	**Medical**	**7**	**1.6 %**	**15**	**3.5%**	**39**	**9.0%**	**125**	**28.9 %**	**73**	**16.9 %**	**0.150**
	Clinical Pharmacy	**13**	**3.0 %**	**60**	**13.9 %**	**80**	**18.5 %**	**83**	**19.2 %**	**23**	**5.3%**	
	Laboratory	**9**	**2.1 %**	**15**	**3.5%**	**26**	**6.0%**	**22**	**5.1%**	**9**	**2.1%**	
	Nursing	**6**	**1.4 %**	**7**	**1.6%**	**5**	**1.2%**	**17**	**3.9%**	**6**	**1.4%**	
You have self-interest and motivation for research	**Medical**	**11**	**2.5 %**	**14**	**3.2%**	**70**	**16.2 %**	**119**	**27.5 %**	**45**	**10.4 %**	**0.292**
	Clinical Pharmacy	**7**	**1.6 %**	**9**	**2.1%**	**17**	**3.9%**	**34**	**7.9%**	**14**	**3.2%**	
	Laboratory	**4**	**0.9 %**	**5**	**1.2%**	**7**	**1.6%**	**17**	**3.9%**	**8**	**1.9%**	
	Nursing	**4**	**0.9 %**	**4**	**0.9%**	**16**	**3.7%**	**15**	**3.5%**	**12**	**2.8%**	

From the table, it is noticed that the significance level is less than 0.05 in the first statement (Develops critical thinking), and in the statement (Assists in changing health policies), indicating a correlation between the academic college of the student and their attitude towards the research's ability to develop critical thinking skills among students, as well as the importance and ability of research in helping to change health policies. However, for the remaining statements, the significance level was greater than 0.05, indicating no statistically significant relationship between the student's academic college and their response to these statements.

c) To identify the relationship between age and students' attitudes towards research, the students' ages were divided into three categories: the first category (20-25), the second category (26-30), and the third category over 30. The frequencies and percentages of responses were extracted for each age group for each point regarding attitudes towards research, and then the correlation coefficient between the students' age and their responses for each point was calculated, as shown in Table 7.

Table 7 Association of Level of Attitude with Age

Statements	Age	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		P-value
		F	%	F	%	F	%	F	%	F	%	
Promotes critical thinking	20-25	14	3.2%	14	3.2%	68	15.7%	156	36.1%	59	13.7%	0.018
	26-30	3	0.7%	1	0.2%	20	4.6%	50	11.6%	38	8.8%	
	above 30	3	0.7%	0	0.0%	2	0.5%	3	0.7%	1	0.2%	
Improves patient's care	20-25	11	2.5%	21	4.9%	45	10.4%	150	34.7%	84	19.4%	0.007
	26-30	3	0.7%	2	0.5%	16	3.7%	44	10.2%	47	10.9%	
	above 30	2	0.5%	0	0.0%	0	0.0%	3	0.7%	4	0.9%	
Research will help one's clinical practice later	20-25	16	3.7%	18	4.2%	33	7.6%	137	31.7%	107	24.8%	0.699
	26-30	2	0.5%	5	1.2%	13	3.0%	53	12.3%	39	9.0%	
	above 30	2	0.5%	2	0.5%	1	0.2%	4	0.9%	0	0.0%	
Helps to changes health policy	20-25	14	3.2%	19	4.4%	40	9.3%	161	37.3%	77	17.8%	0.613
	26-30	3	0.7%	3	0.7%	14	3.2%	62	14.4%	30	6.9%	
	above 30	2	0.5%	0	0.0%	2	0.5%	4	0.9%	1	0.2%	
Undergraduate students should participate in clinical research projects	20-25	12	2.8%	24	5.6%	51	11.8%	141	32.6%	83	19.2%	0.543
	26-30	3	0.7%	8	1.9%	19	4.4%	50	11.6%	32	7.4%	
	above 30	2	0.5%	0	0.0%	0	0.0%	3	0.7%	4	0.9%	
It is an extra burden to do research	20-25	20	4.6%	68	15.7%	94	21.8%	94	21.8%	35	8.1%	0.636
	26-30	9	2.1%	24	5.6%	30	6.9%	38	8.8%	11	2.5%	
	above 30	3	0.7%	1	0.2%	2	0.5%	3	0.7%	0	0.0%	
You have self-interest and motivation for research	20-25	17	3.9%	24	5.6%	78	18.1%	136	31.5%	56	13.0%	0.739
	26-30	6	1.4%	8	1.9%	31	7.2%	45	10.4%	22	5.1%	
	above 30	3	0.7%	0	0.0%	1	0.2%	4	0.9%	1	0.2%	

Through the table, it is noted that the significance level value is less than 0.05 in the first point (developing critical thinking) and in the point (improving patient care), indicating a correlation between the students' age and their attitudes towards the ability of research to develop critical

thinking among students, as well as a relationship between the students' age and their response regarding the importance and ability of research to improve patient care. However, for the other points, the significance level was greater than 0.05, indicating no statistically significant relationship between age and the students' responses to these attitudes.

3.5 Variations according to gender for each variable

In order to observe the variations of the respondents on attitudes, knowledge and barriers toward medical research related to gender, we used Mann-Whitney test for the two independent samples.

3.5.1 Attitude

Through the table 8, it is observed that the significance level value is greater than 0.05 in all situations, which means there is no statistically significant difference attributed to the gender variable (males and females).

Table 8: Mann-Whitney Test for gender variation according to attitude

Variable	Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney	Z	P-value
Promotes critical thinking	Male	322	214.16	68960.0	16957.0	-0.716	0.474
	Female	110	223.35	24568.0			
	Total	432					
Improves patient's care	Male	322	215.91	69523.5	17520.5	-0.180	0.858
	Female	110	218.22	24004.5			
	Total	432					
Research will help ones clinical practice later	Male	322	211.35	68055.0	16052.0	-1.573	0.116
	Female	110	231.57	25473.0			
	Total	432					
Helps to changes health policy	Male	322	211.99	68260.0	16257.0	-1.405	0.160
	Female	110	229.71	25268.0			
	Total	432					
Undergraduate students should participate in clinical research projects	Male	322	213.50	68747.0	16744.0	-0.909	0.363
	Female	110	225.28	24781.0			
	Total	432					
It is an extra burden to do research	Male	322	214.41	69040.0	17037.0	-0.616	0.538
	Female	110	222.62	24488.0			
	Total	432					
You have self-interest and motivation for research	Male	322	212.16	68316.0	16313.0	-1.304	0.192
	Female	110	229.20	25212.0			
	Total	432					

3.5.2 Knowledge

Table 9 Mann-Whitney Test for gender variation according to knowledge

Statments	Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney	Z	P-value
You are aware of research methodology	Male	322	216.52	69718.0	17705.0	-0.005	0.996
	Female	110	216.45	23810.0			
	Total	432					
You can formulate a research protocol	Male	322	220.18	70897.5	16525.5	-1.103	0.270
	Female	110	205.73	22630.5			
	Total	432					
You can evaluate a scientific literature	Male	322	218.97	70508.0	16915.0	-0.737	0.461
	Female	110	209.27	23020.0			
	Total	432					
You can perform simple statistical analysis	Male	322	224.49	72284.5	15138.5	-2.355	0.018
	Female	110	193.12	21243.5			
	Total	432					
You can write a research paper	Male	322	221.54	71336.5	16086.5	-1.485	0.137
	Female	110	201.74	22191.5			
	Total	432					

By examining the table, it is observed that the level of significance is less than 0.05 in the statement "You can perform simple statistical analysis". This means that there is a statistically significant difference in knowledge between male and female students, with male students having a greater understanding of basic data analysis. For the rest of the statements, the level of significance was greater than 0.05, indicating no statistically significant differences in knowledge between male and female students for those statements.

3.5.3 Barrier

Table 10 Mann-Whitney Test for gender variation according to Knowledge

Statements	Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney	Z	P-value
There is allotted time to pursue research	Male	322	222.25	71565.5	15857.5	-1.695	0.090
	Female	110	199.66	21962.5			
	Total	432					
There is adequate training in research methodology	Male	322	222.25	71566.0	15857.0	-1.686	0.092
	Female	110	199.65	21962.0			
	Total	432					
"There are adequate facilities for research (internet, and journals)"	Male	322	220.33	70946.0	16477.0	-1.130	0.259
	Female	110	205.29	22582.0			
	Total	432					
There are enough rewards/motivations to participate in research	Male	322	219.82	70780.5	16642.5	-0.976	0.329
	Female	110	206.80	22747.5			
	Total	432					
There is adequate training on how to write a manuscript	Male	322	226.08	72796.5	14626.5	-2.827	0.005
	Female	110	188.47	20731.5			
	Total	432					
There is adequate training on how to perform simple statistical analysis	Male	322	222.17	71539.0	15884.0	-1.672	0.095
	Female	110	199.90	21989.0			
	Total	432					
Research mentors are easily available	Male	322	225.22	72520.5	14902.5	-2.585	0.010
	Female	110	190.98	21007.5			
	Total	432					
It is easy to obtain approval for conducting a research from college	Male	319	222.33	70924.0	14887.0	-2.326	0.020
	Female	109	191.58	20882.0			
	Total	428					
Lack of time due to overburden with other educational activities	Male	322	207.49	66810.5	14807.5	-2.721	0.007
	Female	110	242.89	26717.5			
	Total	432					
Priority is given to other educational activities by the university than research	Male	322	212.52	68430.5	16427.5	-1.187	0.235
	Female	110	228.16	25097.5			
	Total	432					
Lack of good research ideas	Male	322	212.09	68292.0	16289.0	-1.311	0.190
	Female	110	229.42	25236.0			
	Total	432					

Through the table, it can be noticed that the level of significance in the point "There is adequate training on how to write a manuscript", "Research mentors are easily available", and "It is easy to obtain approval for conducting research from college" is less than 0.05, which means that there are differences in the responses of students regarding these obstacles in favor of students. In the point "Lack of time due to overburden with other educational activities", the level of significance

was less than 0.05, indicating that there are statistically significant differences in the responses between male and female students, in favor of females. As for the rest of the points, the level of significance was greater than 0.05, indicating the absence of statistically significant differences in the responses of male and female students regarding these obstacles.

3.6 Variations according to Age for each variable

In order to observe the variations of the respondents on attitudes, knowledge and barriers toward medical research related to age, we used Kruskal Wallis Test for independent samples.

3.6.1 Attitude

Table 11 Kruskal Wallis Test for Age variation according to attitude

Variable	Age	N	Mean Rank	Chi-Square	df	p-value
Promotes critical thinking	20-25	311	207.46	13.796	2	0.001
	26-30	112	247.70			
	above 30	9	140.67			
Improves patient's care	20-25	311	206.89	7.637	2	0.022
	26-30	112	242.08			
	above 30	9	230.44			
Research will help ones clinical practice later	20-25	311	216.94	9.313	2	0.010
	26-30	112	224.53			
	above 30	9	101.56			
Helps to changes health policy	20-25	311	214.20	3.992	2	0.136
	26-30	112	227.96			
	above 30	9	153.50			
Undergraduate students should participate in clinical research projects	20-25	311	214.49	0.561	2	0.755
	26-30	112	220.19			
	above 30	9	239.94			
It is an extra burden to do research	20-25	311	217.81	1.845	2	0.398
	26-30	112	217.20			
	above 30	9	162.50			
You have self-interest and motivation for research	20-25	311	217.38	1.036	2	0.596
	26-30	112	217.24			
	above 30	9	176.78			
	Total	432				

Through the table, it is observed that the level of significance is less than 0.05 in the first three statements (Promotes critical thinking), (Improves patient's care) and (Research will help one's clinical practice later), indicating statistically significant differences in these statements

attributable to age. As for the remaining statements, the level of significance was greater than 0.05, indicating no statistically significant differences in these statements attributable to age.

3.6.2 Knowledge

Table 12 Kruskal Wallis Test for Age variation according to Knowledge

Variable	Age	N	Mean Rank	Chi-Square	df	p-value
You are aware of research methodology	20-25	311	211.95	1.836	2	0.399
	26-30	112	229.40			
	above 30	9	213.17			
	Total	432				
You can formulate a research protocol	20-25	311	213.48	0.719	2	0.698
	26-30	112	224.15			
	above 30	9	225.56			
	Total	432				
You can evaluate a scientific literature	20-25	311	215.49	0.086	2	0.958
	26-30	112	219.34			
	above 30	9	216.00			
	Total	432				
You can perform simple statistical analysis	20-25	311	206.63	7.536	2	0.023
	26-30	112	242.80			
	above 30	9	230.39			
	Total	432				
You can write a research paper	20-25	311	217.17	0.106	2	0.948
	26-30	112	213.95			
	above 30	9	225.22			
	Total	432				

Through the table, it can be observed that the significance level is greater than 0.05 in all knowledge-related statements except for the statement "You can perform simple statistical analysis". This means that there are statistically significant differences in students' knowledge about their ability to analyze data based on their age, but no significant differences were found in students' knowledge for the remaining statements.

3.6.3 Barrier

Based on the table 13, it is observed that the significance level value in all the points related to research barriers was greater than 0.05, meaning that there were no statistically significant differences in students' responses to these barriers, regardless of their age.

Table 13 Kruskal Wallis Test for Age variation according to Barrier

Variable	Age	N	Mean Rank	Chi-Square	df	p-value
There is allotted time to pursue research	20-25	311	211.04	2.412	2	0.299
	26-30	112	229.38			
	above 30	9	244.89			
	Total	432				
There is adequate training in research methodology	20-25	311	208.76	4.710	2	0.095
	26-30	112	235.00			
	above 30	9	253.61			
	Total	432				
"There are adequate facilities for research (internet, and journals)"	20-25	311	215.82	0.049	2	0.976
	26-30	112	217.90			
	above 30	9	222.67			
	Total	432				
There are enough rewards/motivations to participate in research	20-25	311	211.14	2.556	2	0.279
	26-30	112	232.16			
	above 30	9	206.72			
	Total	432				
There is adequate training on how to write a manuscript	20-25	311	211.93	2.265	2	0.322
	26-30	112	225.73			
	above 30	9	259.72			
	Total	432				
There is adequate training on how to perform simple statistical analysis	20-25	311	214.89	1.260	2	0.533
	26-30	112	217.45			
	above 30	9	260.50			
	Total	432				
Research mentors are easily available	20-25	311	214.60	0.304	2	0.859
	26-30	112	221.88			
	above 30	9	215.22			
	Total	432				
It is easy to obtain approval for conducting a research from college	20-25	308	214.09	1.614	2	0.446
	26-30	111	219.48			
	above 30	9	167.22			
	Total	428				
Lack of time due to overburden with other educational activities	20-25	311	217.10	5.411	2	0.067
	26-30	112	222.01			
	above 30	9	127.33			
	Total	432				
Priority is given to other educational activities by the university than research	20-25	311	215.19	3.975	2	0.137
	26-30	112	225.89			
	above 30	9	144.83			
	Total	432				
Lack of good research ideas	20-25	311	220.54	1.747	2	0.418
	26-30	112	203.98			
	above 30	9	232.89			
	Total	432				

3.7 Variations according to college for each variable

In order to observe the variations of the respondents on attitudes, knowledge and barriers toward medical research related to college, we used Kruskal Wallis Test for independent samples.

3.7.1 Attitude

Table 14 Kruskal Wallis Test for college variation according to attitude

Variable	College	N	Mean Rank	Chi-Square	df	p-value
Promotes critical thinking	Medical	259	230.38	12.959	3	0.005
	Clinical Pharmacy	81	179.72			
	Laboratory	41	222.21			
	Nursing	51	199.86			
Improves patient's care	Medical	259	223.95	4.888	3	0.180
	Clinical Pharmacy	81	216.76			
	Laboratory	41	183.27			
	Nursing	51	204.98			
Research will help one's clinical practice later	Medical	259	225.70	4.705	3	0.195
	Clinical Pharmacy	81	201.30			
	Laboratory	41	193.15			
	Nursing	51	212.70			
Helps to changes health policy	Medical	259	228.23	8.088	3	0.044
	Clinical Pharmacy	81	199.62			
	Laboratory	41	183.44			
	Nursing	51	210.30			
Undergraduate students should participate in clinical research projects	Medical	259	224.53	7.596	3	0.055
	Clinical Pharmacy	81	216.88			
	Laboratory	41	170.44			
	Nursing	51	212.16			
It is an extra burden to do research	Medical	259	215.95	0.937	3	0.816
	Clinical Pharmacy	81	209.11			
	Laboratory	41	231.09			
	Nursing	51	219.32			
You have self-interest and motivation for research	Medical	259	221.75	1.299	3	0.729
	Clinical Pharmacy	81	207.19			
	Laboratory	41	210.78			
	Nursing	51	209.24			
	Total	432				

Based on the table, we observe that the significance level in the point (Promotes critical thinking) and the point (Helps to change health policy) is less than the significance level of 0.05. This means that there are statistically significant differences in both the students' response regarding their ability to develop critical thinking skills and their response regarding the research's help in changing health policy, which can be attributed to the college to which the student belongs. As for the rest of the points, all significance level values were greater than 0.05, indicating no difference in the students' responses regarding these situations, regardless of their college.

3.7.2 Knowledge

Table 15 Kruskal Wallis Test for college variation according to Knowledge

Variable	College	N	Mean Rank	Chi-Square	df	p-value
You are aware of research methodology	Medical	259	218.86	2.934	3	0.402
	Clinical Pharmacy	81	211.22			
	Laboratory	41	192.40			
	Nursing	51	232.30			
	Total	432				
You can formulate a research protocol	Medical	259	218.52	7.516	3	0.057
	Clinical Pharmacy	81	218.80			
	Laboratory	41	172.23			
	Nursing	51	238.16			
	Total	432				
You can evaluate a scientific literature	Medical	259	217.64	15.832	3	0.001
	Clinical Pharmacy	81	235.87			
	Laboratory	41	150.30			
	Nursing	51	233.19			
	Total	432				
You can perform simple statistical analysis	Medical	259	213.23	15.031	3	0.002
	Clinical Pharmacy	81	249.72			
	Laboratory	41	161.70			
	Nursing	51	224.42			
	Total	432				
You can write a research paper	Medical	259	210.82	11.703	3	0.008
	Clinical Pharmacy	81	241.35			
	Laboratory	41	172.22			
	Nursing	51	241.45			

Through the table, it can be observed that the level of significance value was greater than 0.05 in the point (You are aware of research methodology) and the point (You can formulate a research protocol), which means there is no difference in students' knowledge of research methodology and their ability to identify and formulate a research protocol across different colleges. However, clear differences were found in the rest of the points, including their ability to evaluate scientific literature, perform simple data analysis, and knowledge of how to write a research paper, as the level of significance was less than 0.05.

3.7.3 Barrier

Table 16 Kruskal Wallis Test for college variation according to Barrier

Variable	College	N	Mean Rank	Chi-Square	df	p-value
There is allotted time to pursue research	Medical	259	216.86	12.815	3	0.005
	Clinical Pharmacy	81	234.31			
	Laboratory	41	157.04			
	Nursing	51	234.16			
There is adequate training in research methodology	Medical	259	201.32	20.693	3	0.000
	Clinical Pharmacy	81	240.04			
	Laboratory	41	192.65			
	Nursing	51	275.38			
"There are adequate facilities for research (internet, and journals)"	Medical	259	206.46	5.493	3	0.139
	Clinical Pharmacy	81	221.81			
	Laboratory	41	241.70			
	Nursing	51	238.80			
There are enough rewards/motivations to participate in research	Medical	259	213.32	1.099	3	0.777
	Clinical Pharmacy	81	221.86			
	Laboratory	41	209.43			
	Nursing	51	229.80			
There is adequate training on how to write a manuscript	Medical	259	207.27	14.734	3	0.002
	Clinical Pharmacy	81	248.31			
	Laboratory	41	176.02			
	Nursing	51	245.38			

Variable	College	N	Mean Rank	Chi-Square	df	p-value
There is adequate training on how to perform simple statistical analysis	Medical	259	203.16	14.935	3	0.002
	Clinical Pharmacy	81	249.46			
	Laboratory	41	192.88			
	Nursing	51	250.89			
Research mentors are easily available	Medical	259	207.04	23.491	3	0.000
	Clinical Pharmacy	81	238.39			
	Laboratory	41	163.33			
	Nursing	51	272.52			
It is easy to obtain approval for conducting a research from college	Medical	258	198.56	12.026	3	0.007
	Clinical Pharmacy	78	237.78			
	Laboratory	41	230.80			
	Nursing	51	246.45			
Lack of time due to overburden with other educational activities	Medical	259	229.38	9.467	3	0.024
	Clinical Pharmacy	81	193.55			
	Laboratory	41	217.71			
	Nursing	51	186.58			
Priority is given to other educational activities by the university than research	Medical	259	215.81	0.980	3	0.806
	Clinical Pharmacy	81	208.40			
	Laboratory	41	221.99			
	Nursing	51	228.45			
Lack of good research ideas	Medical	259	224.62	6.109	3	0.106
	Clinical Pharmacy	81	221.52			
	Laboratory	41	189.16			
	Nursing	51	189.26			

Through the table, it can be observed that the points "There are adequate facilities for research (internet, and journals)", "There are enough rewards/motivations to participate in research)", "Priority is given to other educational activities by the university than research)", and "Lack of good research ideas" had a significance level greater than 0.05, indicating no statistically significant differences in student responses to these obstacles across different colleges. As for the remaining statements, the significance level was less than 0.05, indicating differences in student responses to these obstacles based on their college.

3.8 DISCUSSIONS

The research findings showed that there were positive attitudes among students at 21 September University, as they expressed their agreement on the importance of research in developing their critical thinking and its significance in improving medical care for patients, assisting individuals in clinical practice later on. This was confirmed by a large percentage of respondents, approximately 60% of medical students, who expressed their motivation and interest in conducting medical research, with a relatively high percentage of them, around 70%, agreeing on the necessity of involving undergraduate students in conducting college research. The researchers attributed these results to the university's awareness of the importance of medical research, considering many of the related materials to the research process, in order to provide students with all the research knowledge and skills in the medical field. These results are in agreement with many previous studies, such as the study of Mohamed Belal et al. (2019) and the study of Hanibernia et al. (2018) [31,32].

However, despite the positive response and attitude of students towards medical research, there was a percentage that expressed opposing views in many situations, and the researchers attributed these responses to the many obstacles that students face, such as the lack of sufficient training on medical research and the lack of enough time due to the many academic and extracurricular activities required of students, especially in medical colleges.

The researchers also attributed the differences in the level of knowledge between male and female students in terms of their ability to perform basic data statistics to the males' greater interest in statistics and the attention to the details related to these statistics.

3.9 CONCLUSIONS

The research reached many conclusions that medical research helps students to develop their critical thinking and their ability to practice their work in the future and care for patients, making them more confident in themselves. This is through paying sufficient attention to conducting research and working on the statistics related to the medical field, as these studies have become an integral part of medicine in all its branches, especially in terms of finding innovative solutions to emerging medical issues. Therefore, it is important to provide more training and support for students in conducting medical research and

encourage them to take part in it, especially undergraduate students, as this will help in achieving the desired goals of the medical field.

REFERENCES

1. Straus SE, McAlister FA. Evidence-based medicine: a commentary on common criticisms. CMAJ. 2000;163(7):837-841.
2. Ramani S, Leinster S. AMEE Guide no. 34: Teaching in the clinical environment. Med Teach. 2008;30(4):347-364.
3. Basson AE. The importance of research and the research method in nursing. Health SA Gesondheid. 2003;8(1):67-73.
4. Kaur J, Kaur J, Kaur R, Kaur N. A Study to Assess the Attitude and Barriers towards Research among Medical Students. International Journal of Scientific Research. 2017;6(8):37-38.
5. Sabzwari SR, Kauser S, Khuwaja AK. Experiences, attitudes and barriers towards research amongst junior faculty of Pakistani medical universities. BMC Med Educ. 2009;9(1):68.
6. Rimmer A. Why are so few UK medical students taking an intercalated degree in the face of a workforce crisis? BMJ. 2015;351:h4024.
7. Dorsey ER, De Roulet J, Thompson JP, Reminick JI, Thai A, White-Stellato Z, et al. Funding of US biomedical research, 2003-2008. JAMA. 2010;303(2):137-143.
8. Chen DT, Wynia MK, Moloney RM, Alexander GC. U.S. physician knowledge of the FDA-approved indications and evidence base for commonly prescribed drugs: results of a national survey. Pharmacoepidemiol Drug Saf. 2009;18(11):1094-1100.
9. United States Government Accountability Office. NIH research funding: Opportunities remain to better identify how and why disparities occur. https://www.gao.gov/assets/gao-16
10. World Health Organization. The WHO strategy on research for health. Geneva: World Health Organization; 2012.

11. Unnikrishnan B, Kanchan T, Holla R, Kumar N, Rekha T, Mithra P, et al. Medical students research - facilitators and barriers. J Clin Diagn Res 2014;8(12):XC01-XC04
12. Ibrahim SI, Afifi AM, Zahran A. Knowledge, attitudes and practices of medical students towards research in two public universities in Egypt. Proceedings of the IRES 23rd International Conference, Dubai, UAE, 29th December 2015, ISBN: 978-93-85832-92-5. Retrieved from: http://www.worldresearchlibrary.org/up_proc/pdf/130-145206235634-39.pdf. (Accessed 12 August 2018).
13. Khan H, Khawaja MR, Waheed A, Rauf MA, Fatmi Z. Knowledge and attitudes about health research amongst a group of Pakistani medical students. BMC Med Educ 2006;6.
14. Noorelahi MM, Soubhanneyaz AA, Kasim KK. Perceptions, barriers, and practices of medical research among students at Taibah College of Medicine, Madinah, Saudi Arabia. Adv Med Educ Pract 2015; 6:479–85.
15. Al-Halabi B, Marwan Y, Hasan M, Alkhadhari S. Extracurricular research activities among senior medical students in Kuwait: experiences, attitudes, and barriers. Adv Med Educ Pract 2014; 5:95–101.
16. Alghamdi KM, Moussa NA, Alessa DS, Alothimeen N, Al-Saud AS. Perceptions, attitudes and practices toward research among senior medical students. Saudi Pharm J 2014; 22(2):113–7.
17. Pawar DB, Gawde SR, Marathe PA. Awareness about medical research among resident doctors in a tertiary care hospital: a cross-sectional survey. Perspect Clin Res 2012; 3(2):57-61.
18. De Oliveira NA, LuzMR, Saraiva RM, Alves LA. Student views of research training programmes in medical schools. Med Educ 2011; 45(7):748–55.
19. Ejaz K, Shamim M, Shamim M, Hussain S. Involvement of medical students and fresh medical graduates of Karachi, Pakistan in research. J Pak Med Assoc 2011; 61(2):115-20.
20. Khan H, Khan S, Iqbal A. Knowledge, attitudes and practices around health research: the perspective of physicians-in-training in Pakistan. BMC Med Educ 2009; 9:46.

21. Khan H, Khawaja R, Waheed A, Rauf M, Fatmi Z. Knowledge and attitudes about health research amongst a group of Pakistani medical students. BMC Med Educ 2006; 6:54.
22. Bakken LL, Sheridan J, Carnes M. Gender differences among physician‐scientists in self‐assessed abilities to perform clinical research. Acad Med 2003;78:1281‐86.
23. Lloyd T, Phillips BR, Aber RC. Factors that influence doctors' participation in clinical research. Med Educ 2004;38:848‐51.
24. Silcox LC, Ashbury TL, VanDenKerkhof EG, Milne B. Residents' and program director's attitudes toward research during anesthesiology training: A Canadian perspective. Anesth Analg 2006;102:859‐64.
25. Ejaz K, Shamim MS, Shamim MS, Hussain SA. Involvement of medical students and fresh medical graduates of Karachi, Pakistan in research. J Pak Med Assoc 2011;61:115‐20.
26. Reinders JJ, Kropmans TJ, Cohen‐Schotanus J. Extracurricular research experience of medical students and their scientific output after graduation. Med Educ 2005;39:237.
27. Ashtyani SC, Shamsi M. Comparison of barriers to research activities forms the point of view of normal and talented students at Arak University of Medical Sciences. Edu Res Med Sci 2012;1:26‐32.
28. Amin TT, Kaliyadan F, Al Qattan EA, Al Majed MH, Al Khanjaf HS, Mirza M. Knowledge, attitudes and barriers related to participation of medical students in research in three Arab Universities. Education in Medicine Journal. 2012 May 7;4(1). DOI:10.5959/eimj.v4i1.7
29. Bin-Ghouth A, Batarfi SA, Abonemi AH, et al. Perception, Attitude, and Practice toward Community Research Among Medical Students in Hadhramout University, Yemen. ResearcSquare. 2021. Available from:https://www.assets.researchsquare.com/files/rs958530/v1/e430137c-dd2b-469f-b6cb-98214ae58b68.pdf?c=1634137650[Last accessed 2022 Oct 24].
30. Al-Shoaibi I, Abdo BA, Abdullah MA. Attitudes,knowledge,and obstaclesregarding medical research among medical students at the Faculty of Medicine and Health Sciences, Ibb University, Ibb,Yemen.Yemen J Med. 2022;XX [Epub ahead of print].

31. S Hanibernia et al. (2018). Knowledge, attitude, and barriers of nursing research among BSc nursing students, in selected nursing college of Malappuram district, Manipal Journal of Nursing and Health Sciences |July 2018 | Volume 4| Issue 2.
32. Bilal M, Haseeb A, Mari A, et al. (2019) Knowledge, Attitudes, and Barriers Toward Research Among Medical Students of Karachi. Cureus 11(9): e5599.

QUESTIONNAIRE

Excuse me, dear doctor . We hope you are well , we need some minutes of your time to answer this questionnaire.

A- Personal data

1-Age: □ 20-25 y □ 26-30 y □ above 30	2-Gender: □ Male /□ Female
3-Collage name: □ Medical College □ Clinical Pharmacy College □ Laboratory College □ Nursing College 4-Academic year: □ Last year	

B- Attitude of respondents toward research

Importance of research (attitude):

5- Promotes critical thinking?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

6- Improves patients' care?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

7- Research will help ones clinical practice later?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

8- Undergraduate students should participate in clinical research projects?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

9- Helps to changes health policy?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

10- You have self-interest and motivation for research?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

11- It is an extra burden to do research?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

C- Knowledge of respondents toward research

Obstacles related to the student (knowledge):

12- You are aware of research methodology?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

13- You can formulate a research protocol?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

14- You can evaluate a scientific literature?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

15- You can perform simple statistical analysis?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

16- You can write a research paper?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

D-Barriers to research

Obstacles related to the college:

17- There is allotted time to pursue research?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

18- There is adequate training in research methodology?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

19- There are adequate facilities for research (internet, and journals)?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

20- There are enough rewards/motivations to participate in research?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

21- There is adequate training on how to write a manuscript?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

22- There is adequate training on how to perform simple statistical analysis?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

23- Research mentors are easily available?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

24- It is easy to obtain approval for conducting a research from college?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

25- Lack of time due to overburden with other educational activities?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

26- Priority is given to other educational activities by the university than research?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree

27- Lack of good research ideas?
□Strongly disagree □ Disagree □ Neutral □ Agree □ Strongly agree