Chapter one

(Introduction/background)

Introduction/background

Research, in a very general term, is a systematic way for finding things you and other people did not know, which are called as research problems. In this sense, as what the discussion on the research process in previous modules has indicated, research is a process consisting of the identifying and defining research problem, formulating and testing the hypothesis through data collection, organization and analysis, making deductions and reaching of conclusion from the test results of the hypotheses, and reporting and evaluating the research. Viewing its process, research is essentially a problem driven activity (1) Since research is problem driven, the first thing to deal in undertaking a study is to identify and determine the problem to study. Identifying a research problem is important because, as the issue or concern in a particular setting that motivates and guides the need for conducting a study, it lays the foundation for an entire project. If the foundation is shaky the entire project is doomed to failure. This is why novice researchers necessitates absolute caution in the initial stages of a research project. Professional researchers could easily identify a research problem because they have been quite familiar with the phenomena in which a problem generally presents itself. By considering the phenomena which include (2) a difficulty or deficiency to be overcome; (3) a condition to be improved upon; (3) a gap in knowledge that exists in scholarly literature that is to be filled; (4) a theory that requires meaningful understanding; or (1)Research training is a curtail element for education progress in the medical field at all. Medical colleges are expected from the learning outcome to educate and train students in research to meet accreditation standards, to support students' career prospects and to generate a pool of researchers. A long-term education strategyplanning for promoting health research is to target medical students early in their careers so that, they are equipped with sufficient research training during their undergraduate studies to meet the top priorities community health problem. This will encourage their critical thinking, will develop critical appraisal skills so they become research oriented (5) Most of the students are not aware of why research is crucial to health care(6) Attitudes towards, knowledge of and barriers against research are the three key factors that have an impact on the success of research (7). Research was made a university function in addition to the task of teaching in the late 19th century after the first academic revolution (8). The research world in Sudan has yet to establish its full identity, especially in the

private sectors. A review of literature showed that there were no data related to attitude, practice, and barriers of students at Sudanese university specially at medical schools toward medical research. Medical schools have reformed curricula to train students in research. Gaps in research training are due to inadequate approaches, shortage of research staff, lack of

funds and scarce infrastructure for research training. Anecdotal reports from theses examiners in Sudan indicate that the majority of students had inadequate knowledge of research indicating insufficient exposure to research training. Most students are not aware of why research is crucial to health care (9). Negative attitudes toward research serve as an obstacle to learning associated with poor performance in research (5). Attitude to, knowledge of and barriers toward research are three key factors that have an impact on research success (10). The perception of undergraduate students toward research is unknown in Sudan. In recent years, research output emanating from academics, has been assessed and used to rank universities against each other (11, 12). Publishing of research work is evidence to justify support of research investigations and a guarantee of subsequent research funding for sustainability of the institute's mandate and organizational goals (13)

Statement of the problem:

Scientific health system research not only promotes health and combats diseases of an individual, but also it can strengthen the effectiveness of health systems. Hence, understanding of scientific methods becomes a crucial component in the medical profession.Even though the students had the positive attitudes toward scientific research, a supportive and positive environment is needed to improve skills and knowledge of research and to overcome the barriers toward the conduct of scientific research. Therefore, crucial to the understanding of problems which affects the health of individuals, communities, and health systems have strong relation to build the well understanding of scientific way of research in undergraduate students as appose to current situation of conducted researches have many problems (lack of scientific writing, organization, shortages of publication)

Research question:

Whether the allocating credited hours in their educational schedules for research activities can help encourage students to gain knowledge, attitude and overcome the barriers towards the research among medical students in Napta college ?

Hypothesis:

It is hypothesized that the gaps to deteriorate research perceptions, due to lack of fixed-time in the academic calendar for student research and research supervisor's interaction,.

Justification (rationale):

Fundamentally the medical research is applied to solve top priorities community health problems, understanding the problem which affect the health system but also can strengthen the effectiveness of health systems. Research can improve the ranking of health profession institutes, accordingly to previous mention evidences for conduction of health system research with one accord in our country there is few achievements behind conduction of research therefore have strong desire to investigate the reasons and major drawbacks lead to this shortage.

Objectives:

General objectives:

To Evaluation of, knowledge attitude, practice, barriers to ward research: The perspectives of undergraduate medical students at Napata College.

Specific objectives:

1. To assess the knowledge of the medical students in research methodology.
2. To evaluate the attitudes of the medical students towards the research.
3. To clarify the main barriers facing medical students towards research.

Chapter two

(Literature review)

Literature review:

Study done by Kyaw Soe and eta revealed that Even though the students had the positive attitudes toward scientific research, asupportive and positive environment is needed to improve skills and knowledge of research and to overcome the barriers toward the conduct of scientific research. (14)

Study done by Sudarshan Paudel, Krishna B GC, and Balakrishnan M Acharya. (2019). Showed that The students have positive perception and attitude towards research. They have faced some barriers thus college needs to train students in research and provide supervision in a small research project. This model would improve academic learning, skills acquisition, encourage student interest in research, reduce barriers to student research and make better use of limited resources (15)

Study conducted by CC-BY-NC TW. 4.0 International license a certified by peer review) revealed that Majority of the respondents believed that research is relevant, only a few were engaged in active research and published articles as evidence. It is therefore recommended that policy makers should devise strategies to focus on active research activities in order to achieve the desire research mandate and goal of institutions in the development of the nation's economy (16)

study done by Osman T. concluded that The curriculum should be revised to address the gaps in research training. A small group learning model should be adopted to train students in research and provide supervision to group research projects. This model would improve academic learning, skills acquisition, encourage student interest in research, reduce barriers to student research and make better use of limited resources. (5).

Definitions

Research has been defined in a number of different ways, and while there are similarities, there does not appear to be a single, all-encompassing definition that is embraced by all who engage in it.

Research in simplest terms is searching for knowledge and searching for truth. In formal sense it is a systematic study of a problem attacked by a deliberately chosen strategy which starts with choosing an approach to preparing blue print (design) acting upon it in terms of designing research hypotheses, choosing methods and techniques, selecting or developing data collection tools, processing the data, interpretation and ends with presenting solution/s of the problem.(5)

Original research, also called primary research, is research that is not exclusively based on a summary, review, or synthesis of earlier publications on the subject of research. This material is of a primary-source character. The purpose of the original research is to produce new knowledge, rather than to present the existing knowledge in a new form (e.g., summarized or classified).(7)(8) Original research can be in various forms, depending on the discipline it pertains to. In experimental work, it typically involves direct or indirect observation of the researched subject(s), e.g., in the laboratory or in the field, documents the methodology, results, and conclusions of an experiment or set of experiments, or offers a novel interpretation of previous results. In analytical work, there are typically some new (for example) mathematical results produced, or a new way of approaching an existing problem. In some subjects which do not typically carry out experimentation or analysis of this kind, the originality is in the particular way existing understanding is changed or re-interpreted based on the outcome of the work of the researcher.(9)

Scientific research is a systematic way of gathering data and harnessing curiosity. This research provides scientific information and theories for the explanation of the nature and the properties of the world. It makes practical applications possible. Scientific research is funded by public authorities, by charitable organizations and by private groups, including many companies. Scientific research can be subdivided into different classifications according to their academic and application disciplines. Scientific research is a widely used criterion for judging the standing of an academic institution, but some argue that such is an inaccurate assessment of the institution, because the quality of research does not tell about the quality of teaching (these do not necessarily correlate).(12)

Generally, research is understood to follow a certain structural process. Though step order may vary depending on the subject matter and researcher, the following steps are usually part of most formal research, both basic and applied:

1. **Observations and formation of the topic**: Consists of the subject area of one's interest and following that subject area to conduct subject-related research. The subject area should not be randomly chosen since it requires reading a vast amount of literature on the topic to determine the gap in the literature the researcher intends to narrow. A keen interest in the chosen subject area is advisable. The research will have to be justified by linking its importance to already existing knowledge about the topic.
2. **Hypothesis:** A testable prediction which designates the relationship between two or more variables.
3. **Conceptual definition:** Description of a concept by relating it to other concepts.
4. **Operational definition:** Details in regards to defining the variables and how they will be measured/assessed in the study.
5. **Gathering of data:** Consists of identifying a population and selecting samples, gathering information from or about these samples by using specific research instruments. The instruments used for data collection must be valid and reliable.
6. **Analysis of data**: Involves breaking down the individual pieces of data to draw conclusions about it.
7. **Data Interpretation:** This can be represented through tables, figures, and pictures, and then described in words.
8. **Test, revising of hypothesis**
9. **Conclusion, reiteration if necessary**

Research in the humanities

Research in the humanities involves different methods such as for example hermeneutics and semiotics. Humanities scholars usually do not search for the ultimate correct answer to a question, but instead, explore the issues and details that surround it. Context is always important, and context can be social, historical, political, cultural, or ethnic. An example of research in the humanities is historical research, which is embodied in historical method. Historians use primary sources and other evidence to systematically investigate a topic, and then to write histories in the form of accounts of the past. Other studies aim to merely examine the occurrence of behaviours in societies and communities, without particularly looking for reasons or motivations to explain these. These studies may be qualitative or quantitative, and can use a variety of approaches, such as queer theory or feminist theory.[13]

No matter what career field you're in or how high up you are, there's always more to learn. The same applies to your personal life. No matter how many experiences you have or how diverse your social circle, there are things you don't know. Research unlocks the unknowns, lets you explore the world from different perspectives, and fuels a deeper understanding. In some areas, research is an essential part of success. In others, it may not be absolutely necessary, but it has many benefits. Here are ten reasons why research is important:\

1. Research expands doctors knowledge base

The most obvious reason to do research is that you'll learn more. There's always more to learn about a topic, even if you are already well-versed in it. If you aren't, research allows you to build on any personal experience you have with the subject. The process of research opens up new opportunities for learning and growth.

2. Research gives doctors the latest information

Research encourages you to find the most recent information available. In certain fields, especially scientific ones, there's always new information and discoveries being made. Staying updated prevents you from falling behind and giving info that's inaccurate or doesn't paint the whole picture. With the latest info, you'll be better equipped to talk about a subject and build on ideas.

3. Research helps doctors know what you're up against

In business, you'll have competition. Researching your competitors and what they're up to helps you formulate your plans and strategies. You can figure out what sets you apart. In other types of research, like medicine, your research might identify diseases, classify symptoms, and come up with ways to tackle them. Even if your "enemy" isn't an actual person or competitor, there's always some kind of antagonist force or problem that research can help you deal with.

4. Research builds doctors credibility

People will take what you have to say more seriously when they can tell you're informed. Doing research gives you a solid foundation on which you can build your ideas and opinions. You can speak with confidence about what you know is accurate. When you've done the research, it's much harder for someone to poke holes in what you're saying. Your research should be focused on the best sources. If your "research" consists of opinions from non-experts, you won't be very credible. When your research is good, though, people are more likely to pay attention.

5. Research helps doctors narrow your scope

When you're circling a topic for the first time, you might not be exactly sure where to start. Most of the time, the amount of work ahead of you is overwhelming. Whether you're writing a paper or formulating a business plan, it's important to narrow the scope at some point. Research helps you identify the most unique and/or important themes. You can choose the themes that fit best with the project and its goals.

6. Research teaches doctors better discernment

Doing a lot of research helps you sift through low-quality and high-quality information. The more research you do on a topic, the better you'll get at discerning what's accurate and what's not. You'll also get better at discerning the gray areas where information may be technically correct but used to draw questionable conclusions.

7. Research introduces doctors to new ideas

You may already have opinions and ideas about a topic when you start researching. The more you research, the more viewpoints you'll come across. This encourages you to entertain new ideas and perhaps take a closer look at yours. You might change your mind about something or, at least, figure out how to position your ideas as the best ones.

8. Research helps with problem-solving

Whether it's a personal or professional problem, it helps to look outside yourself for help. Depending on what the issue is, your research can focus on what others have done before. You might just need more information, so you can make an informed plan of attack and an informed decision. When you know you've collected good information, you'll feel much more confident in your solution.

9. Research helps doctors reach people

Research is used to help raise awareness of issues like climate change, racial discrimination, gender inequality, and more. Without hard facts, it's very difficult to prove that climate change is getting worse or that gender inequality isn't progressing as quickly as it should. The public needs to know what the facts are, so they have a clear idea of what "getting worse" or "not progressing" actually means. Research also entails going beyond the raw data and sharing real-life stories that have a more personal impact on people.

10. Research encourages curiosity

Having curiosity and a love of learning take you far in life. Research opens you up to different opinions and new ideas. It also builds discerning and analytical skills. The research process

rewards curiosity. When you're committed to learning, you're always in a place of growth. Curiosity is also good for your health. Studies show curiosity is associated with higher levels of positivity, better satisfaction with life, and lower anxiety.

Chapter three

(Materials and Methods)

Materials and Methods:

Study design:

This descriptive cross-sectional study was conducted from June to September 2022 among undergraduate medical students of Napata College.

Study area

Napata college was establish as education and community development center it has seven Scientific programmers as flowing medical and surgical program medical libraries program nursing sciences program pharmacy dentistry information computer sciences programmers it located Sudan Khartoum in ryad city almashtal area Sudan and has medical colleges complex in kafori algantera area Khartoum bahri

Study population:

Fourth and fifth years students learned how to conduct research methodology at faculties of medicine.

Inclusion criteria:

1. All Fourth and fifth year students of the Napata College.
2. Regular students.

Exclusion criteria:

1. Other faculties than medicine.
2. Students whom absent in day of data collection.

Study duration:

Study was conducted from March to September 2022 among undergraduate medical students of Napata College.

Sampling techniques:

A simple random sample was taken; every member of the student of medicine has an equal chance of being selected.

Student of Faculty of medicine fourth year: 112

Student of Faculty of medicine fifth year: 110

Total sampling frame =222

Then select the sample size by

Sample size:

$n=N/1+N(d)^2$

n=sample size

N=population

size d=degree of

precision (0.04)

n=222/1+222(0.0

$4)^2$= 163

Number to every student in the Napata College database from 1 to 222, and use a random number generator to select 163 numbers.

Data collection and Study variables:

Data was collected by constructed questionnaire.

Background variables:

Demographic description of respondents (sex, age, medical school and level of the study):

Dependent variables:

Variable of knowledge ,attitude, practice, and barriers to ward research.

Independent variables

Variable of Research experience and training

Data analysis:

Data analysis was conducted using Statistical Package for the Social Sciences (SPSS®) version 22 software.

Ethical consideration:

IRB approval was obtained. All procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees.

Chapter four

(Result)

Participant's demographics data:

A total of completed questionnaires were received from 163 undergraduate medical students. Among the study population, 53 (32.5%) respondents were males and 110 (67.5%) were females. We found the mean age was 27.9. . Distribution of students depending on the level of study, were fourth year 95 (68%), fifth year 68 (32%) table (1) fig (1)

Table (1) show Frequency of gender among study population(n=163)

Gender	Frequency	Percent
Male	53	32.5%
Female	110	67.5%
Total	163	100%

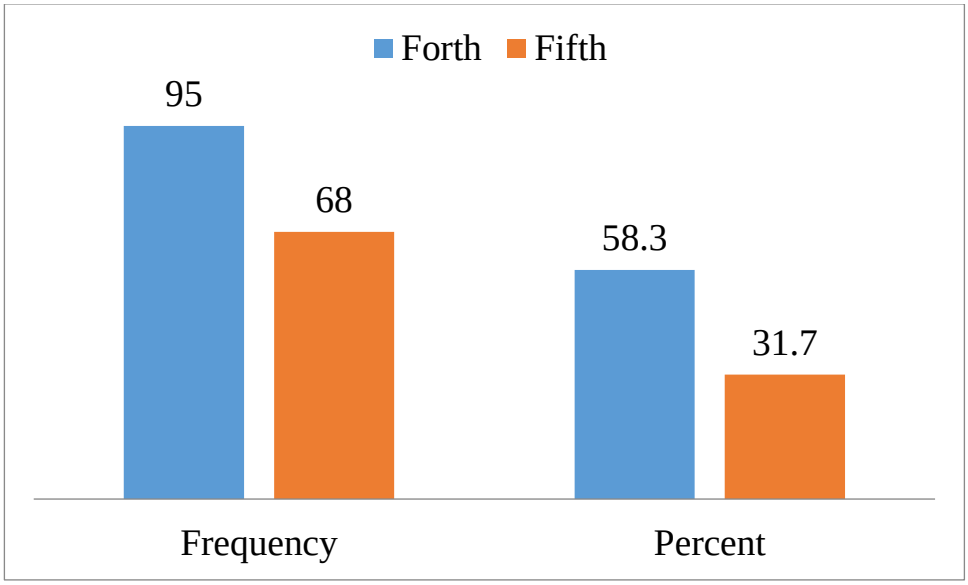

Fig (1) show the distribution of population by level of study (n=163)

Medical students' response towards knowledge

The knowledge of research was investigated through 9 questions related to Components of scientific research, Components of scientific research Contents of abstract Definition of research hypothesis Types of research objectives Contents of methodology chapter in the research Sampling procedures Calculation of sample size Composition of results section Referencing research 53%- 52%-70%-60% -55%- 61%- 58% -53%-54% respectively the overall participants had good knowledge about scientific research table (2)

Table (2) show Frequency of knowledge about scientific research among study population(n=163)

Respondents' knowledge: (frequency) %	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree,**
Components of scientific research	(50)30.7%	(60)36.7%	(45)27%	(5)2.9%	(3)2%
Contents of abstract	(39)38.7%	(50)24.5%	(58)22.7%	(14)13.5%	(2)0.6%
Definition of research hypothesis	(56)23.0%	(64)30.7%	(33)35.6%	(7)8.6%	(3)1.2%
Types of research objectives	(74)34.4%	(55)39.3%	(30)20.2%	(3)4.1%	(1)2%
Contents of methodology chapter in the research	(57)45.4%	(64)(33.7%	(39)18.4%	(2)1.8%	(1)0.6%
Sampling procedures	(47)35%	(52)39.3%	(37)23.9%	(21)1%	(6)0.8%
Calculation of sample size	(96)28.8%	(30)31.9%	(39)22.7%	(23)12.9%	(2)3.7%
Composition of results section	(69)42.3%	(30)18.4%	(39)23.9%	(23)14.1%	(2)1.2%
Referencing	(75)46%	(37)22.7%	(31)19%	(18)11%	(2)1.2%

Medical students' response Attitudes towards the research

Attitudes towards the research were evaluated through 7 questions according to the student's attitude regarding degree of the attitude. The results found that the majority of students important of studying compulsory research methodology course (55%)

. Also, most of them (51.5%) that Conduction of research is difficult. Similarly, the majority of them said Undergraduate can carry out research and write paper (58) Research conduction secure better residency position.(2.5) %), minority of them consent that the research is useful in my future profession (2,4%) Undergraduate should participate in research(36.3)I feel confident in interpreting and writing paper.(36.8) table (3)

Table (3) show Frequency of **Attitude** about scientific research among study population(n=163)

Respondents' Attitudes: (frequency) %	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree,**
Undergraduate should participate in research.	(22)13.5%	(59)36.3%	(1)0.5%	(1)0.7%	(80)49.1%
Undergraduate can carry out research and write paper.	(68) 41.7%	(69)42.3	(22) 14.7%	(1)1%	(1)0.2%
Conduction of research is difficult.	(47)28.8%	(84)51.5%	(14)8.6%	(12)7.4%	6)3.7%
Importance of studying compulsory research methodology coarse.	(30)18.4%	(96)55.2%	(17)10.4%	(14)8.6%	(12)7.4%
I feel confident in interpreting and writing paper.	(7)4.3%	(22)15.3%	(60)36.8%	(58)35.6%	(13)8%
Research is useful in my future profession.	(34)20.9%	(91)2.4%	(26)16%	(8)4.9%	(4)55.8%
Research conduction secure better residency position.	(1)1.5%	(3)2.5%	(31)19%	(106)65%	(22)13.5%

Medical students' response towards the barriers of conducting research

the barriers between the student and the research were evaluated through 7questions. The question was summarized and then converted into a percentage to represent the barriers. The result was reported that the majority of them they have Lack of interest (65%). Correspondingly, most of them Lack of sufficient research training (57%). However, we found the majority of them said that there is a lack of Financial support (47.2%). Majority of them said that there Lack of motivations (46.6%). Also, we found the most of them said Lack of statistical support (39.3)Lack of mandatory course of research methodology (34.4%). Lack of time for conduction of the research (2.5) table (4)

Table (4) show Frequency **Perceptions regarding barriers** about scientific research among study population(n=163)

Perceptions regarding barriers against students' research: **(frequency) %**	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree,**
Lack of interest	(10)6.1%	(106)65%	(41)24.2%	(5)3.1%	(1).6%
Financial causes	(45)27.6%	(77)47.2%	(22)13.5%	(13)8%	(6)3.5%
Lack of time for conduction of the research	(5)3.1%	(4)2.5%	(52)31.9%	(77)47.2%	(25)15.3%
Lack of mandatory course of research methodology	(74)45.4%	(56)34.4%	(24)14.7%	(7)4.3%	(2)1.2%
Lack of statistical support	(68)41.7%	(64)39.3%	(19)11.7%	(9)5.5%	(3)1.85%
Lack of motivations	(59)36.2%	(76)46.6%	(11)6.7%	(12)7.4%	(6)3.1%
Lack of sufficient research training	(38)23.2%	(94)57.2%	(13)8%	1(3)8%	(5)3.1%

Medical students' response towards practice of conducting research

Among the 163 students who actually participated in a research project(20%) , Conduction of research(0.7%) Publishing a scientific paper (0.3%)Research presentation in conference (0.1%)

Table (5) show Frequency **Respondents' to practice** about scientific research among study population(n=163)

Respondents' to practice: (frequency) %	**Yes**	**No**
Participation in research	(33)20%	(130)80%
Conduction of research	(1)0.7%	(162)99.3%
Publishing a scientific paper	(1)0.3%	(162)99.7%
Research presentation in conference	(1)0.1%	(162)99.9%

Chapter five

(Discussion, conclusion and recommendation)

Discussion

Research is an extremely important element in the advancement of better health care services provided to the public. An adequate level of knowledge, positive attitude, and reasoning skills play an important role in carrying out research (8)

In this study, we aimed to assess the knowledge, attitude barriers and practice of medical students toward medical research throughout163 medical students.

The overall result of knowledge among them was encouragingly good (54%), where about 53%of the students knew the types of research. This result was similar to another study conducted on undergraduate students in Egypt who have demonstrated moderate level of knowledge in terms of research (9).

The attitude of participant towards medical research was investigated in the current study, and the findings exhibited that the majority of students (55.2 %) they advise to Importance of studying compulsory research methodology course.

Our results are incompatible with results from other studies conducted in countries with the same educational situation; low knowledge level with high positive attitudes towards research was seen in Egypt and the Gulf countries (14, 20, 21).

Also, most of them (88.2%) consent that the research will help in better understanding our subject. Similarly, the majority of them said that the research will help one's clinical practice later (81.7%), most of the students felt the importance of research in clinical practice and agreed to spend time for research. This finding was similar to the study done in south Africa that reported the importance of research interest by most of the participants [11]. Minority of them consent that the research is not waste of time and dose not disturb studies (44.2%).

The current study also investigated the barriers of students towards medical research, and reveled that the majority of them taught that the main barriers in conducting research have Lack of interest (65%). In the oppose to our study, Soe et al., showed that the majorly of students cited barriers were the lack of time (79.9)Evidence also showed that existence of

barriers brings the gap between theory of scientific research and practice of conducting it (13)

Among the 163 students who actually participated in a research project (20%) , Conduction of research(0.7%) Publishing a scientific paper (0.3%)Research presentation in conference (0.1%)

However, the low number of the above mention points in this current study can be possibly explained by the above reported barriers. The lack of proper mentoring and sufficient research skills

Limitation

There were some limitations in this study, the study was conducted in one medical institution; duty lack of time and resources

Conclusion

The undergraduate medical students had moderate level of knowledge and positive attitudes toward medical research. Lack of awareness, lack of faculty encouragement for research, and the difficulty in obtaining resources and data for research were the major barriers. These barriers need to be addressed by providing proper supervision, research funding and awards, and providing access to electronic databases to encourage the undergraduate students participating in research activities. It is recommended to organize research workshops, frequent research presentations, and journal clubs to provide knowledge and skills needed for the medical students to implement the scientific research in the future.

Recommendation

Even though the students had the positive attitudes toward scientific research, we recommended that much college administration effective supportive and positive environment is needed to improve skills and knowledge of research and to overcome the barriers toward the conduct of scientific research.

Chapter sex

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Evaluation of knowledge ,attitude, practice, barriers to ward research: The perspectives of undergraduate medical students at Napata College, 2022.

Background information of the respondents:

Gender:
Age :
Student level:

Respondents' knowledge:	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree,**
Components of scientific research					
Contents of abstract					
Definition of research hypothesis					
Types of research objectives					
Contents of methodology chapter in the research					
Sampling procedures					
Calculation of sample size					
Composition of results section					
Referencing					

Respondents' practice:	**Yes**	**No**
Participation in research?		
Conduction of research?		
Publishing a scientific paper?		
Research presentation in conference?		

Respondents' attitude:	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree,**
Undergraduate should participate in research.					
Undergraduate can carry out research and write paper.					
Conduction of research is difficult.					
Importance of studying compulsory research methodology coarse.					
I feel confident in interpreting and writing paper.					
Research is useful in my future profession.					
Research conduction secure better residency position.					

Perceptions regarding barriers against students' research:	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree,**
Lack of interest					
Financial causes					
Lack of time for conduction of the research					
Lack of mandatory course of research methodology					
Lack of statistical support					
Lack of motivations					
Lack of sufficient research training					