



# Why Sudanese doctors should consider research career or PhD degree after their postgraduate medical training?

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**Abstract:** Sudan is a diverse African country with different cultures, tribes and populations. Medical education continues to evolve rapidly in Sudan. The Sudan Medical Specialization Board (SMSB) is currently the main and only organization responsible for the training of doctors in all specialities. Engaging young doctors in scholarly research activities and producing clinically competent and research-oriented medical workforces are essential demands, particularly in a country like Sudan. In this article, we explained why doctors in Sudan need to do research even if they are not considering studying for a PhD degree. We also discussed why doctors should consider a PhD degree in order to be independent researchers and leaders in clinical research. There are golden opportunities for research on different issues like communicable and non-communicable diseases. Importantly, doctors also have the chance to explore and research in social and psychological sciences. Medical education is another unique area for research as the country have medical schools with different systems. The opportunity for young Sudanese doctors to have a PhD degree with training in a clinical speciality will allow them to have a successful research career. Strong research experiences for young doctors will come with significant benefits for the health system and Universities in Sudan. Beside the interpersonal and managerial skills gained (time management, project management, analytical skills, collaboration and learning from different teams), universities and communities will benefit in term of better management of applied research directed according to the need of the community. Sudan Medical Specialization Board can assess the practicality of offering one programme for dual degrees (PhD and clinical MD). Such a programme will definitely fill the gap with skilled physician-scientists in Sudan. Implementation of such an innovative programme in Sudan will represent a unique experience not only in the Middle East but also in Africa.

**Keywords:** Evidence-based; physician-scientists; The Sudan Medical Specialization Board (SMSB); postgraduate training programme; health system

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## Introduction

Over the last hundred years of medical education in Sudan, the main focus was in clinical training. Those who went in research or acquired research degrees mainly stem from their personnel choice and enthusiasm. However, the majority or almost all Sudanese doctors have that secret love for research and publications. Perhaps the fact that its time-consuming industry and the majority of clinicians have to work in private clinics to support their families have made that affection for research deeper but for the majority not possible to achieve. The benefits of research for the clinicians, community, patients and hospitals and medical schools and universities are enormous and this can be seen in *Table 1* (1-5). Conduction of research is also important as the recent change in the political system is expected to bring revolutionary changes in term of medical education and postgraduate medical training. Ultimately, this may enhance the research output of all medical schools in Sudan. In this review we have discussed what type of research is needed in Sudan, why doctors in Sudan need to do research and why doctors in Sudan need to consider PhD degree. We present the following article in accordance with the Journal of public Health and Emergency reporting checklist.

## Methodology

We have performed an electronic searched of PubMed, Medline, Scopus, and Google Scholar for English published literature during the last three decades, we used the keywords: medical education in Sudan, medical postgraduate in Sudan, medical school and MD-PhD programme. We have also searched for the benefits of PhD programme in general and in particular for medical doctors.

## What type of research is needed in Sudan?

The type of research we recommend for all doctors at this stage in the history of Sudan and the next 10 years is populations clinical studies research. This type of research can be either observational studies or clinical trials. The observational studies involve cross-sectional study, prospective cohort study, case-control study and the nested case-control study (6). Sudan is a large country inhabited by different ethnic groups and populations, and clinical population research may yield exciting data. Also, certain diseases are related to habits and traditions and research in patient education and preventative medicine

can be essential factors (7,8). This can also lead to a more scientific understanding of different tribes and populations. Importantly, genetic factors and their roles in diseases in Sudan is not fully understood and explored (8,9). The population studies will also not cost a significant amount of money on a similar scale to lab-based research using state of the art methods and expensive equipment with a high cost of maintenance and turn offer. Therefore, community-oriented research is what is needed in Sudan.

## Why doctors in Sudan need to do research?

It is expected that engagement in research will lead to the development of an environment where doctors can look for the appraisal for their data in comparison with international data and this will enhance the culture of looking for new evidence and engagement with recent advances in medicine and sciences (10). The important part of the population studies is the fact that this involves different teams and peoples with different skills, not necessarily related directly to medicine as a profession like a statistician. Therefore, this will also come with the benefits of learning to work in one team and multidisciplinary approach (10).

In the view of the recent COVID-19 pandemic, it is possible to suggest that further research is urgently needed to understand and research more about COVID-19 in Sudan. Nobody can predict whether the second wave of COVID-19 will occur or not, and it's not clear whether different pandemics can occur. COVID-19 also showed the importance of research in social science and medical education such an interdisciplinary collaboration can yield into a new and unique outcome and further fostering to collaboration in research. For instance, most of the medical education is now online and experience in this field is important and crucial. Engaging in research will increase doctor's personnel satisfaction due to an increase in interest in learning, and the feeling of developing that intellectually curious attitudes towards challenges rising from the current communicable and non-communicable disease in Sudan. Besides all these benefits, research will come with benefit of enhancing skills in writing and publication. Ultimately this will increase the contribution of Sudan towards the global medical research output and also allow Sudanese doctors to attend and contribute to international conferences by submitting abstracts in different fields of medicine. This will increase the chance of Sudanese researchers to attract international collaborations and possibly international research grants.

**Table 1** The benefits of research for the clinicians, patients, hospitals, medical schools and the community

Benefits for clinicians	Benefits for patients, hospitals, universities and the community
1. Ability to provide critical evaluation of new evidence and provide the best patient care	1. Opportunity to develop new medicines, prevention of disease, new procedures and new tools
2. Ability to design clinical studies according to the need of the community	2. Important information about disease trends and risk factors, outcomes of treatment or public health interventions, functional abilities, patterns of care, and health care costs and use
3. Research can be associated with better clinical performance	3. The evidence showed that research-active hospitals have better patient care and clinical outcomes
4. The research in the clinical area makes doctors more informed about the literature in their field, may develop authority in such field	4. Patients who participate in research in clinical trials access cutting-edge treatments
5. Develop and strengthen doctors' interpersonal skills (like time management, project management, dealing with different teams, literature reviews, statistical skills, writing and communication skills, dealing with challenges, national and international collaboration and strategic thinking)	5. A research-engaged hospital motivates staff
6. The opportunity to disseminate research findings and innovations in the delivery of healthcare	6. A research-engaged hospital attracts high-calibre doctors and raises the profile of an organisation
7. The opportunity to have the choice to passionately build a career around healthcare areas you are interested in and explore new areas of interest to you (this per se may protect against a lot of hurdles and monotonous of clinical practice)	7. A research-engaged hospital brings in financial income
8. Increase in job satisfaction with different varieties in day to day practice	8. Opportunity for medical schools to be involved in conduction of cutting edges research and collaboration with different clinicians in research and teaching
9. An opportunity to gain extra qualifications that help in the future career	9. Increase the profile of medical schools and ranking of the universities
10. An opportunity to present in international conferences and travel around the World	10. Job satisfaction will allow the retention and recruitment of current staff and in the future will allow attracting high calibre staff to join (Brain drain is a common problem in Sudan)

This will also help Sudanese Diaspora who are engaged in research in different countries like USA, UK and Gulf countries to collaborate with Sudan and involve in knowledge transfer. Abdalla *et al.* identified the benefit of Sudanese diaspora to the health system in Sudan (11). Interestingly, other African medical diasporas also contributed to the health system in their countries, while the Somali-Swedish global health initiative was about rebuilding research capacity in fragile states (12,13). It worth mentioning, that the main hinders for the establishment of research in Sudan are the lack of funding and time to be dedicated for research (14).

### Why doctors in Sudan need to consider PhD degree after their medical speciality?

The only way for training in the medical speciality in Sudan is through Sudan Medical Specialization Board (SMSB) which can extend from 4–6 years in any medical speciality. While exposure to scientific research starts from the final years in medical schools where medical students get assigned to research methodology courses and summited their dissertation before graduation. Nowadays, publications by medical students and fresh graduates in Sudan start to show in national and international journals, and research environments become more helpful through various research groups that

**Table 2** The benefits and skills gained during the PhD course

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1. Experience in research design
2. Experience in research methods
3. Experience in the literature review
4. Experience in epidemiology and statistics
5. Experience in the appraisal of clinical research
6. Experience in scientific writing
7. Experience in publication
8. Experience in presenting data in international and national conferences
9. Develop critical thinking
10. Develop skills to be an independent investigator
11. Writing for grant application
12. Transferable skills like (analysis and problem solving, interpersonal and leadership skills, self and project management and work habits (meeting deadlines for abstract and publication)

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dominated by medical students and early career doctors.

The training is extensive and involves significant work load. At the moment there is no programme for offering dual training in the research and clinical practice. It worth mentioning at the end of the final year in training with SMSB, doctors have to complete a research thesis before the end of their training. This will not be on a similar scale to the research experience as a PhD degree. The combination of medical speciality with PhD degree will allow clinicians to have unique career pathway. This because such combination of clinical and research experience will create the passion of researching medical problems and challenges and fuel that ambition and desire to understand the mechanism of disease and ultimately this may help in the management of the diseases (15). Therefore, SMSB can assess the benefit and practicality of offering such an opportunity for Sudanese doctors. This for postgraduate training only and not similar to undergraduate programme in Western countries (16). Such type of program will be difficult to implement in Sudan as this will involves radical changes in the undergraduate curriculums and necessitate significant experience in medical education. In addition, to other challenges such as needs for mentoring, facilitating integration with students in each phase, integrating the curriculum to foster mastery of skills needed for each phase, awareness of the educational differences between MBBS and PhD training, and support needed. We have not elaborated in details about the steps needed for the implementation of the clinical postgraduate MD-PhD programme as we feel this can be beyond the scope of this review.

In *Table 2* we highlighted the benefits Sudanese doctors may gain from being involved in a PhD degree. The experience doctors can gain from working in common medical, educational or social issues in Sudan can be enormous and may extend beyond the list we have provided in *Table 2*. This may ultimately provide an opportunity to ignite research interest and enthusiasm in young doctors and they may seek to research this medical, educational or social problems inside Sudan for the rest of their medical career. This can be extremely beneficial for patients in Sudan, the community as a whole and also the medical education in Sudan. Generally speaking, there is extreme shortage of physician-scientist in Africa and Middle East (17-19).

It worth mentioning that the common problems that also faced by doctors in Western countries could also occur in Sudan during studying for PhD degree: longer duration of the training, the long hours of working alone, less financial income, less time for family, finding suitable supervisor, funding for research and decrease in opportunities to attend and participate in international conferences. Overcoming these challenges may provide good skills to survive the future journey as physician-scientist. Our sincere suggestion before you think of doing PhD you will need to ask yourself two questions. The first question: Are you doing the PhD for the sake of personal and professional benefits only or you want to continue with research as life long career? The second question: Are you fulfilling the criteria listed in *Table 3* which explain the student qualities for research? (20) If you think you meet most or all of these criteria, you will

**Table 3** The personal qualities that doctors need to check before enrolling in a PhD course

1. Ability to work and think independently and confidence
2. Perseverance and commitment
3. Good writing skills and ability to express ideas
4. Organisation skills and time management
5. Curiosity and ability to solve problems are very important pillars for researchers in low resource setting countries
6. Passion and enthusiastic about research related to medical problems in Sudan
7. Ability to think critically, synthesize, conceptualise, produce rationale and scientific proposal, as these skills will help in attracting national and international funds
8. Diligence and hard work
9. Self-motivation

likely be successful in your future research career. Some of these criteria are essential, while others can be acquired. For instance, diligence and hard work are necessary during the PhD course or research career. They can be gained through strong work ethics, discipline, focus, efficiency and professionalism. Over the years this will be part of the normal nature for the researcher. While self-motivation is the essential component that will provide momentum for the long journey. Not having most of the qualities mentioned in *Table 3* may slow the candidate progress with a PhD course, or he/she may not complete the course. Importantly, best clinical practice is based on research and evidence-based medicine. Therefore, we encourage all Sudanese doctors to make the most of the currently available research opportunities, not only for personnel and profession benefits but also in contributing to the health of Sudanese nation in urban and rural areas and those living in the remote areas.

## Conclusion

Being a doctor is a career of lifelong learning and teaching in medical school, during the ward rounds and in a research setting. In the world of technology and internet revolution, the world becomes like a small village. Therefore, to keep with rapid development in medical information and address future challenges like a pandemic of COVID-19, enriching the research opportunities and open more opportunities for doctors to do a PhD will significantly increase effectiveness of clinical practice in Sudan. The combined degree of PhD and clinical MD will increase the number of clinical scientists (physician-scientists) in Sudan. The benefits of such programme for Sudan can be seen in the following: (I) increase the numbers of young doctors with research

experience (II) young researchers are always equipped with energy and enthusiasm to explore and test theories (III) young researchers are likely to stay in one field or one research for next 20–30 years and this may allow them to gain national and international recognition for their academic institutes and Sudan (IV) Besides, Sudan has rare and neglected tropical diseases and an increase in non-communicable diseases, there is an urgent need to conduct more research in the field of COVID-19. (V) such programme will enhance and strengthen the conduction of research in medical schools in Sudan.

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