

## Research Article

# The Path of Undergraduate Medical Education in Sudan

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### Abstract

**Background:** Sudan's experience with undergraduate Medical Education (UME) started in 1924 with one school, currently there are about 66 medical schools. During this period many local and global socioeconomic events took place and molded UME. This study was set to document the course and influencing factors that shaped Sudanese UME.

**Methods:** An extensive literature search was conducted, all the relevant articles and websites were accessed, hard copy documents were reviewed and personal communications with eminent Sudanese figures in the field were conducted.

**Results:** Sudanese UME is meagerly documented and its history can be described in four phases. The establishment phase (1924-1974) one school was founded and it was influenced by the Flexner's era and Sudanese independence. The Provincial expansion phase (1975-1990) was influenced by Sudan's commitment to Al-Ma Ata recommendations and current educational innovations. Revolution in Higher Education (1991-2004,) led to mushrooming of public and private UME, was influenced by global trend in privatization and local sociopolitical turbulence. Quality assurance and accreditation phase (2005-2019) was influenced by contradicting local factors and strong international directions.

**Conclusion:** Sudan's history and experience with UME is almost one century old during this time it experienced triumphs and setbacks. Numerous lessons were learned and can contribute to facing the challenges of UME here and beyond. After December Mighty Revolution which changed the old political regime, the country entered a transitional stage devoted to rebuilding and repair in all sectors including education. Studies such as this one will provide the needed data for reforming UME.

**Keywords:** Sudan; Medical Education; Reform, Higher Education; Accreditation

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## 1. Introduction

Sudan is the third-largest country in Africa with a total population of around 40 million [1]. It had borders with seven countries, and its capital is Khartoum. Sudan is a miniature representation of the diversity observed in most African countries [2, 3]. The country is composed of 18 states; approximately 66% of the population lives in rural areas [4],

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and the poverty percentage is around 46.5% [5]. The country suffers a marked shortage in health workforce worsened by poor distribution over the country and massive brain drain that depleted Sudan of more than half its doctors and almost one-third of higher education teaching faculty [6, 7].

Sudan Medical Education (ME) is one of the oldest in the Region [8] and has maintained high quality and good reputation. Currently, it is witnessing unprecedented transformation and challenges that threaten its progression. Sudan is one of the countries with greatest numbers of medical schools; that constitute about 23% of medical schools in Sub-Saharan Africa and 10% of that in EMRO Region [9] yet, ME literature from Sudan represents only 2% of that reported from Sub-Saharan Africa [10].

The Sudanese health professionals had contributed massively to the development of education and medical and health practice and health systems organization in the region for a long time. This regional influence is deemed to increase; due to multiple reasons Sudan is considered as one of the major exporting countries for health professionals [8].

This situation necessitates proper review and scrutiny of the history and influences that modeled the UME leading to the current state, and thereafter to take informed action for continuing its legacy.

By reviewing the articles and collecting the relevant data the researcher was attempting to answer the following questions:

1. What is the chronological order of events?
2. What are the incidents that triggered or influenced each phase?

## Objectives

To document the path of undergraduate medical education in Sudan from 1924 – 2019, and deduct the factors that contributed to its transformation throughout the years.

## 2. Methods

In the period between July 2018 to July 2019 an extensive literature search was conducted using PubMed, Google Scholar and African Journals Online using the term

“Medical Education in Sudan”. Moreover, relevant cited articles were searched by search engines and through direct contact to their authors.

Further information and documents were accessed from the Ministry of Higher Education and Scientific Research website, also by reviewing the different medical schools’ websites and Facebook pages. Furthermore, the Sudan Medical Council and Sudan Medical Heritage Foundation were consulted for more data on ME. Finally, personal communications with many national figures in ME were conducted. The ethical clearance for this study was obtained from Ahfad University for Women’s Ethical Review Board.

### 3. Results

In this study, 268 articles were retrieved and only 32 articles seemed relevant. 22 articles were retrieved as full articles, six as abstracts, and for four articles no abstracts were available. Only three articles were of significance to the subject of this study [2, 11, 12].

#### 3.1. Establishment of medical schools through the years

ME in Sudan started in 1924 with the establishment of Kitchener Memorial School of Medicine (KSM). In 1978 two provincial medical schools were established at Juba in South Sudan and Gezira Universities. In 1990 two more schools were established; one of them was the first private-not-for-profit school in Sudan. In this same year, the government launched the “Revolution in Higher Education” leading to a great expansion in UME. This brought about a lot of public and professional concerns, hence the regulators of ME in Sudan adopted the international basic standards for accreditation of UME.

In 2005, 73% of these medical schools were public. However, private schools slowly followed. About 58% of the public schools were established in the period from 1990 to 2000, and about 67% of the private schools were established in the period 2011 to 2018. (Fig 1)

Currently, there are about 66 medical schools in the country; they are equally divided as public and private ones. Here its important to note that Khartoum State hosts 51.5% of the medical schools in the country; nine of them are public, and 25 are private one (Fig 2)

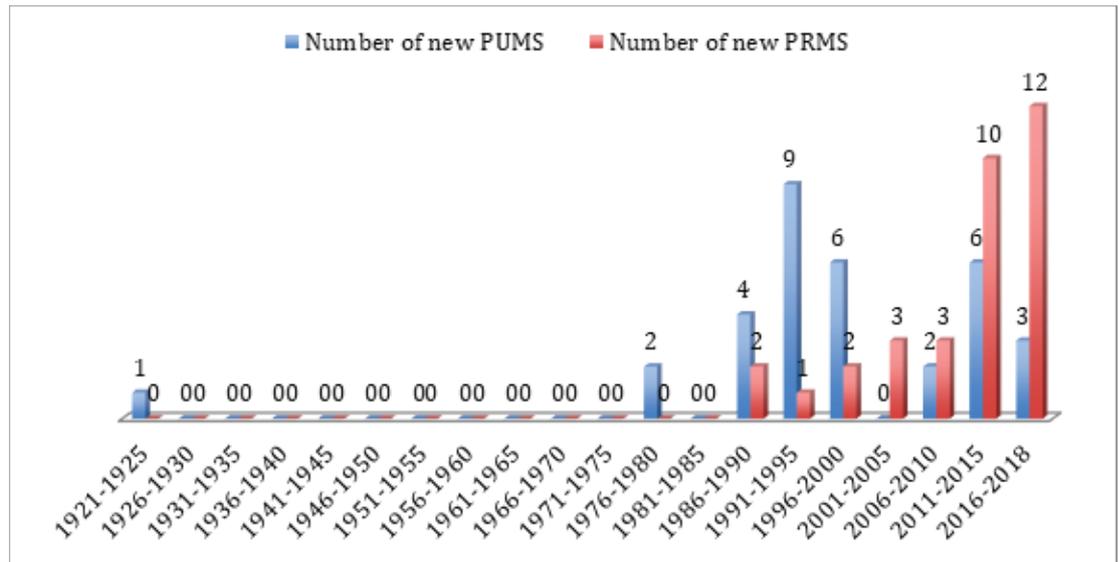


Figure 1: The MS Number, type and year of Establishment.

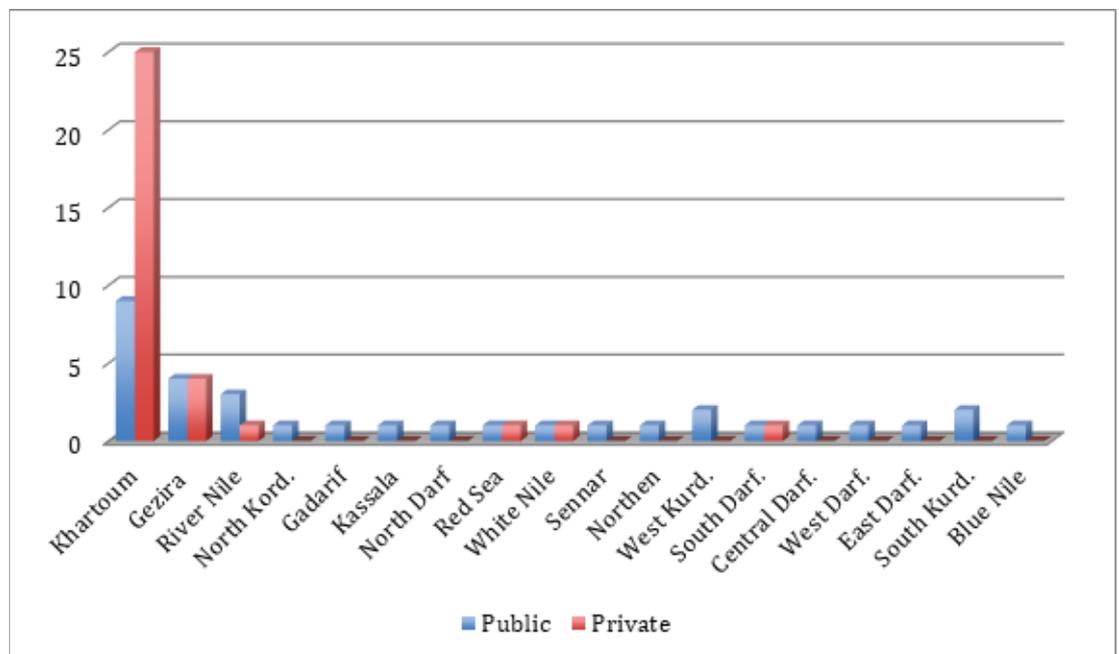


Figure 2: The distribution of the medical school according to Sudan states.

### 3.2. Distribution of Medical Schools across the States

Governed by the stated philosophy of the “Revolution in Higher Education”, there is now at least one public school in each State, this goal took about 26 years to materialize. However, there is no clear basis for the regional distribution of medical school especially when population density is considered.

Sudan is also divided into different regions that include the Northern (two States), Eastern (four States), Southern (six States), Western (three states) and Central (three

States). The Central Region, composed mainly from Khartoum and Gezira and it possess about two-thirds of the medical schools (65%), and they constitute 43% of the public schools and 89% of the private schools in the country (Tab.1 & Fig.3). This Region is populated by around one-third of the population. North Kurdufan State is part of the Central Region, but its contribution to the above percentages is negligible.

TABLE 1: Distribution of Medical Schools/Region.

Regions	Central	%	North	%	South	%	West	%	East	%	Total	%
<b>Public MS</b>	14	<b>42.4</b>	4	<b>12</b>	8	<b>24.2%</b>	3	<b>9</b>	4	<b>12</b>	33	<b>100</b>
<b>Private MS</b>	29	<b>87.8</b>	1	<b>3</b>	2	<b>6%</b>	0	<b>0</b>	1	<b>3</b>	33	<b>100</b>
<b>Tot N. MS</b>	43	<b>65</b>	5	<b>7.5</b>	10	<b>15</b>	3	<b>4.5</b>	5	<b>7.5</b>	66	<b>100</b>
<b>Pop/Mil</b>	14.5	<b>35.6</b>	2.4	<b>5.5</b>	11.7	<b>28.7%</b>	4.3	<b>10.5</b>	7.8	<b>19</b>	40.7	<b>100</b>

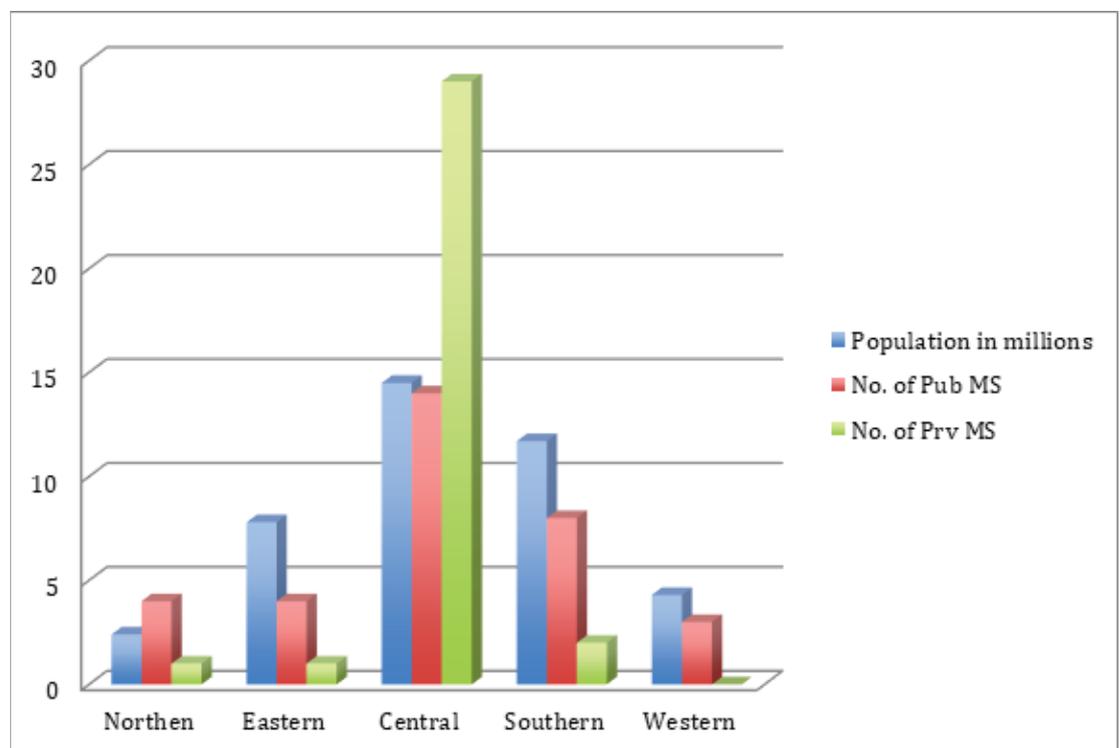


Figure 3: The distribution of Medical Schools according to their types and Sudan Regions /Population.

## 4. Discussion

Over one century, Sudanese medical education has dramatically expanded. The path through which it evolved can be presented in four phases that were influenced by various local and global factors distinct to each phase.

#### 4.1. The establishment Phase: 1924-1974

It is the longest phase, which is characterized by a slow and steady capacity building of teaching and administrative staff, infrastructure, stability and high quality of product [2]. Throughout this phase, there was only one school in the country. It was thoroughly documented by Haseeb in 1967 [12].

The Kitchener Memorial School of Medicine was the second medical school in Africa with a comprehensive syllabus (13,14). It started with a four years curriculum and gradually extended to six years to comply with the international standards. In 1946 KSM certificate became fully acknowledged by the different Royal Colleges of the United Kingdom and it was part of the Khartoum University College, which was part of the University of London. With Sudan independence in 1956, Khartoum University College obtained the full status of a university signaling the birth of the Faculty of Medicine, University of Khartoum (FMUofK).

Global directions in ME, as well as the local sociopolitical factors, have greatly influenced this phase. Some of the factors were:

- Flexner's report and its extending impact on ME. This report was addressed to North American ME but its impact resonated globally. It emphasized that clinical education should be grounded in scientific disciplines with a clear demarcation between the basic and clinical phases of the program [15], which should be done in teaching hospitals, and schools should abide by a highly selective students' admission process [16].
- A relatively stable and functioning health delivery system that cooperated harmoniously with the medical school. This system was considered as a world model for health services in the 1940s and 1950s [17]. Modern health services were introduced in the country since 1902 (13,14,18) but long before that time, between 1863-1866 there was a military hospital in each province of the Turco-Egyptian Sudan (from 1821-1885) however, these hospitals were limited to military and government officials (14,17).
- Sudanese independence and the rise in national pride have influenced decisions about standards, and strategies for ME. Sudanese elites adopted western standards in areas such as civil services so as to be equivalent to the west and not

less. Postgraduate training was pursued in prestigious institutes mainly in the UK before establishing local programs at the University of Khartoum.

The Faculty of Medicine at the University of Khartoum had paid considerable attention to the standard of the teaching faculty and the quality of students' training. Thus the Educational Development Center was established in 1970. The above factors have influenced the quality of graduates and contributed to the excellent reputation Sudanese doctors continued to enjoy.

#### **4.2. Provincial expansion phase: 1975 -1990**

The provincial expansion in higher education started in 1975 by the establishment of two regional public universities to foster fair distribution of services in the country. Juba town in the South of Sudan hosted "Juba University" and Medani town in the Center accommodated "Gezira University".

The initial plan for these medical schools was to start in 1976 by the same curriculum of FMUofK, but their direction was changed to adopt more innovative programs [19]. Both schools launched their programs in 1978. The Faculty of Medicine in Gezira University (FMGU) in particular, is famous for being one of the founding members of the international movement towards Community Oriented/Based Medical Education (COME) and as one of the world pioneers in Problem Based Learning (PBL) [10].

In 1990 two medical schools were established at Omdurman Islamic University – a public institute and Ahfad University for Women. Ahfad Medical School was the first private, not-for-profit medical school with COME mandate using PBL approach. In addition to delivering graduates well suited for their community, Ahfad aspired to bridge the gender gap in the medical profession [20].

The phase was shaped by:

- The WHO efforts in advancing public health, which culminated in the Alma Ata Declaration in 1978. The Sudanese government has committed itself to the declared recommendations and adopted Community Oriented/Based Medical Education (COME) in the newly founded schools.
- The rise of constructivist views about learning, resulting in PBL as an efficient strategy for ME.

By the end of this phase, there were five schools, four of them were public, and one private and three of them had innovative community-oriented curricula as recommended by Alma Ata declaration mandated reform.

### **4.3. Higher Education Revolution phase: 1991 - 2004**

The launching of the so-called “Revolution in Higher Education” in the early 90s of the last century resulted in establishing numerous universities in different parts of Sudan. Some of the stated motives were to increase the number of graduates so as to keep up with the growing population numbers [21], to enhance the development of the different parts of Sudan through establishing State universities, to promote context-sensitivity through Islamizing and Arabicizing of the curricula; and to encourage the establishment of private institutes. It was expected that it would solve the long-standing problem of poor distribution of doctors across the country by the enrollment of students from these states to retain them in their states after graduation (22,23).

Consequently, the number of medical graduates increased from around 600/year in 1990 to 5000/year in 2006 [2]. In these 15 years the number of medical schools stretched more than seven times to reach 30. Eight of these schools were private and all of them located in Khartoum State.

The strategy of expanding the number of schools and graduating class seemed both wise and reliable and has been practiced in other parts of the world to deal with similar problems [24], in Sudan the strategy was applied without proper planning or implementation [2].

Some of the main influential events/threats were:

- Political turbulences and the increased instability of the population.
- Escalation of the civil war with its financial burden on the national budget.
- The United States sanctions on Sudan that acted as a barrier to international scientific interaction.
- Accelerating brain drain, mounting to what was considered as a national threat and severe worry to the plan of Human Resources for Health (HRH), the health system and the quality of training for medical students [6].
- Privatization of ME, which started to appear in Sudan and other parts of the world [25]. In the Middle East, including Sudan, privatization of medical schools is mainly

for-profit [10]. In principle privatization is quite acceptable and even welcomed, but in the absence of strict regulatory requirements and transparency, it can easily compromise quality [26] and may lead to the production of doctors not adequately representing the Sudanese society.

- The increasing dichotomy between health and education systems and arbitrary distribution of medical schools.
- The concentration of medical schools in the capital, Khartoum State hosted 16 schools that competed for almost the same training sites resulting in a severe problem for the clinical training.

#### **4.4. Quality Control & Accreditation phase: 2005 till now**

The proliferation of medical schools was not timely paralleled with a similar increase in the basic resources needed for reasonable ME [2]. Authorities in higher education were always very concerned with the quality of education, yet formal efforts started to appear in 2000 – which is relatively early in the Region. Since that time, many efforts have been put to regulate ME and ensure its quality in relation to contextualized international standards. Examples of these efforts are: development of “The Model College” document in 2003 [27], formation of the National Accreditation Committee, which governs the National Accreditation Program [28], as well as the launching of the National Accreditation Program first round was in 2010 – 2012, and the second round started in 2018 [29]. Currently, Sudan Medical Council gained international recognition as an accrediting body by the WFME through its recognition program. This is considered a very positive development for Sudanese ME. Moreover, Sudan is one of the first ten countries in the world to obtain this recognition [30].

This phase coincided with and is still being molded by many influences. Some of them are:

- The global rise of accreditation culture due to changes in medical practice, health care delivery system, aspiration for quality assurance and the emphasis on humanitarian values.
- The development of the International Basic Standards for Undergraduate Medical Education by the WHO and the WFME. To deal with important challenges, they defined a new direction for ME and advocated for the accreditation system that

is based on national and regional standards [27]. The international standards were proposed to act as a backbone for integrating the national and regional accreditation procedures [31].

- The signing of the Comprehensive Peace Agreement (CPA) in Sudan in 2005 that brought promises of the new prosperous era - CPA has ended a 21-year-old civil war in Sudan. At that time, Sudan raised as oil-producing country and investments extended to private ME.
- Escalation of privatization in UME; 25 new medical schools were established, and the majority of them were in Khartoum.
- Separation of the South of Sudan in 2011 and the significant economic hardship as Sudan had lost great shares of its oil resources. This had direct implications on the financial support of education and health [7].
- Increasing rates of migration resulting in severe shortage in HP, based on the WHO benchmark for the number of health workers per number of population; Sudan was classified as a country with a critical shortage, resulting in Sudan falling short from achieving any of the Millennium Development Goals in 2015 [7].
- Increased awareness about the need for formal training of medical teachers through faculty development programs of variable durations. Currently there are five Master's Degree Programs for Medical Education in Sudan.
- Rise in public dissatisfaction from the health system and service providers with increasing incidents of hostilities towards doctors.
- The incidence of "December Mighty Revolution" that succeeded to change the political regime that ruled Sudan for 30 years. Presently, there is a transitional government with the mandate to prepare the country for the upcoming elections. Meanwhile, professionals from different specialties are working on strategies to guide comprehensive reform in the country – this includes ME.

## 5. Recommendations and Conclusion

Effort should be devoted to documenting the path of medical education and the existing obstacles and hurdles. This effort must involve all stakeholders, especially the public, must contribute to the discussion about the current status of UME and find context-sensitive strategies to improve the situation.

In conclusion, Sudanese ME has distinguished itself as a very dynamic and resilient entity that was shaped by local as well as global factors. In the quest to improve the health of Sudanese people, various strategies and innovations in ME were tried.

In order to learn from its shortcomings and celebrate its triumphs, this experience needs more documentation and evaluation. December Mighty Revolution spirit and the wisdom of medical educators will act as a springboard for launching the comprehensive reform capable of addressing all the present challenges and place Sudan back to where it belongs as a leading country that pioneered and excelled in ME as well as many other fields.

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## Conflict of Interest

The author confirms no conflict of interest

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