

## Research Article

# Overview of the Course of Undergraduate Medical Education in the Sudan

Tahra Al Sadig Al Mahdi

Medical Education, School of Medicine, Ahfad University for Women, Omdurman, Khartoum, Sudan

### Abstract

**Background:** Sudan's experience with Medical Education (ME) is one of the oldest regionally. It started with one school and has currently reached 66. This number is among the highest and Sudan is one of the largest physicians-exporting countries. Thus, Sudanese ME has great regional influence.

**Objective:** To review the history of Sudanese ME and determine factors contributing to its transformation.

**Methods:** Internet and desk search was conducted, relevant articles and websites were accessed, hard documents were reviewed, and eminent Sudanese figures in the field were consulted.

**Results:** Sudanese ME is meagerly documented. The path of ME was described in four phases including some of the significant local and global factors.

Phase one (1924–1970) started by establishing the first medical school and characterized by steady growth and stability. Influences were the Flexner's era and the Sudanese independence atmosphere. During phase two (1978–1990), provincial public schools were opened in addition to the first private school. Influences were the Sudan's commitment to Al Ma Ata recommendations and the revolutionary changes following constructivist views on learning. Phase three (1990–2005) was formed by the Revolution in Higher Education leading to mushrooming of public and private schools across the country and influenced by local sociopolitical turbulence. In phase four (2006–2018), authorities launched formal ME regulatory efforts. It is still being transformed by contradicting local factors and strong international directions.

**Conclusion:** Sudanese experience with ME is noteworthy; it offers important lessons and gives the needed wisdom for dealing with ME challenges in Sudan and beyond.

Corresponding Author:  
Tahra Al Sadig Al Mahdi

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## 1. Introduction

Sudan is the third largest country in Africa with a total population of around 40 million people [1]. It borders seven countries and its capital is Khartoum. Sudan is a miniature representation of the diversity found in most African countries [2, 3].

The country is composed of 18 states; approximately 66% of the population lives in rural areas [4], and the percentage of poverty is around 46.5% [5]. The country suffers from a marked shortage in health workforce worsened by poor distribution over the

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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].

Sudanese Medical Education (ME), which is one of the oldest in the Region [10], is witnessing unprecedented transformation and challenges that threaten its progression.

Sudan is one of the countries with greatest numbers of medical schools; about 23% of medical schools in Sub-Saharan Africa and 10% of that in EMRO Region [8] – yet, ME literature from Sudan represents only 2% of that coming from Sub-Saharan Africa [9].

Sudanese health professionals have been contributing to the development of the education and practice of health professionals and health systems in the Region for a long time. This regional influence is deemed to increase due to the recent outflow that classified Sudan as one of the major exporting countries [10].

This situation necessitates proper review and scrutiny of the history, and influences that modeled Sudanese ME leading to the current situation, and thereafter to take informed action for preserving its heritage.

## Objectives

To document the path of undergraduate ME in Sudan from 1924 – 2018, and deduct the factors that contributed to successes and shortcomings of Sudanese ME.

## 2. Methods

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 using search engines and by directly contacting their authors.

Further information and documents were accessed from the ministry of higher Education website, websites and Facebook pages of some medical schools, Sudan Medical Council and Sudan Medical Heritage Foundation. Finally, the information was reviewed by some of the major medical educationists who witnessed and contributed to shaping Sudanese ME (annex 1).

### 3. Results

268 articles were retrieved; 32 seemed relevant. All of the 32 articles sites were visited; 22 were found as full articles, 6 as abstracts and 4 had no abstract available. Only three articles were of significance to the subject of this study. Two more cited articles were requested and obtained from their authors.

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

ME in Sudan started in 1924 with the establishment of Kitchener School of Medicine (KSM). In 1978 two provincial schools were opened in Juba and Gezira Universities. In 1990 Ahfad University for Women opened its medical school as the first private-not-for-profit school. In this same year the government launched the “Revolution in Higher Education” leading to great expansion in ME.

In 2005, new schools were mainly public (73%), but private schools slowly followed.

About 58% of the public school opened in the period from 1990 to 2000, and about 67% of the private schools opened from 2011 to 2018. (Figure 1)

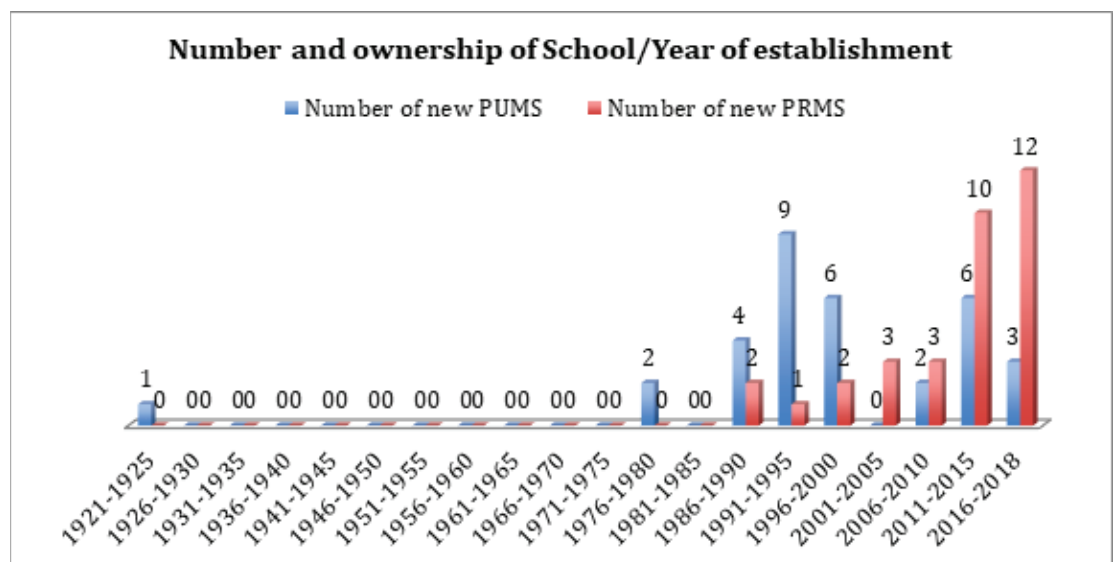


Figure 1: Number and Ownership of School/Year of Establishment.

Currently the number is 66 schools, divided equally between public and private ownership.

Khartoum hosts 51.5% of the medical schools in the country; nine of them are public and 25 are private. (Figure 2)

The detailed table is attached (annex 2)

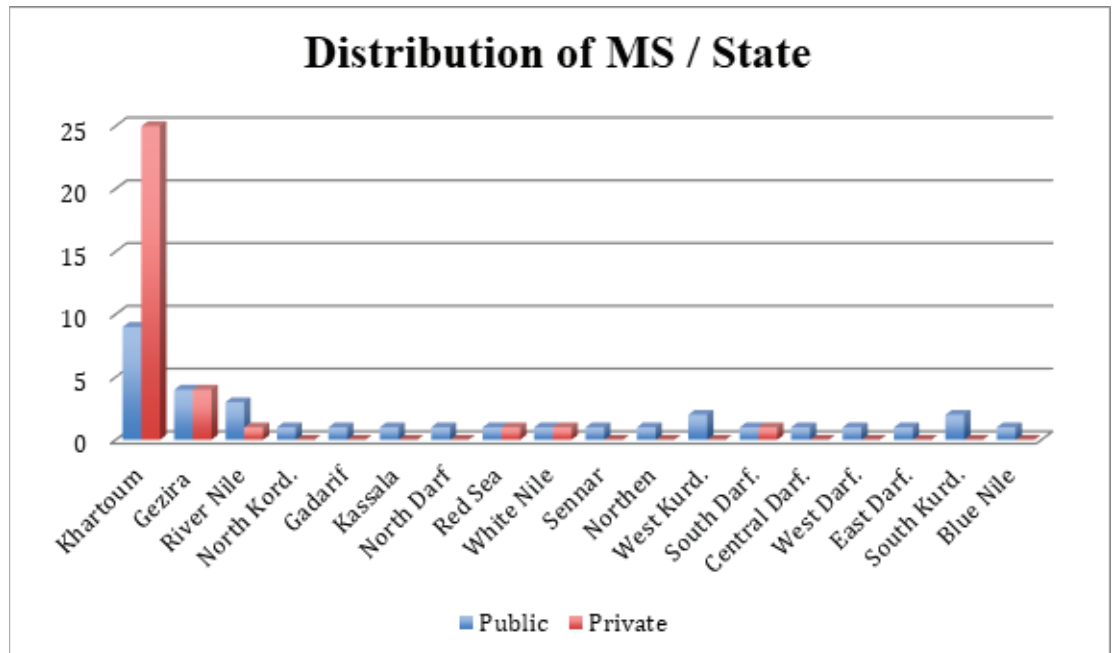


Figure 2: Number of Medical Schools/State.

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

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 actualize. However, there is no clear basis for the regional distribution of medical school especially when population density is considered.

The Regions are formed as follows: Northern (two States), Eastern (four States), Southern (six States), Western (three States) and Central (three States). The Central Region, mainly Khartoum and Gezira possess about two thirds of the medical schools (65%), which is about 43% of the public schools and 89% of the private schools. (Table 1 & Figure 3). This Region is populated by around one third of the population. North Kurduan State is part of the Central Region but its contribution to the above percentages is negligible. Detailed table for distribution per State is attached (Annex 3).

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>

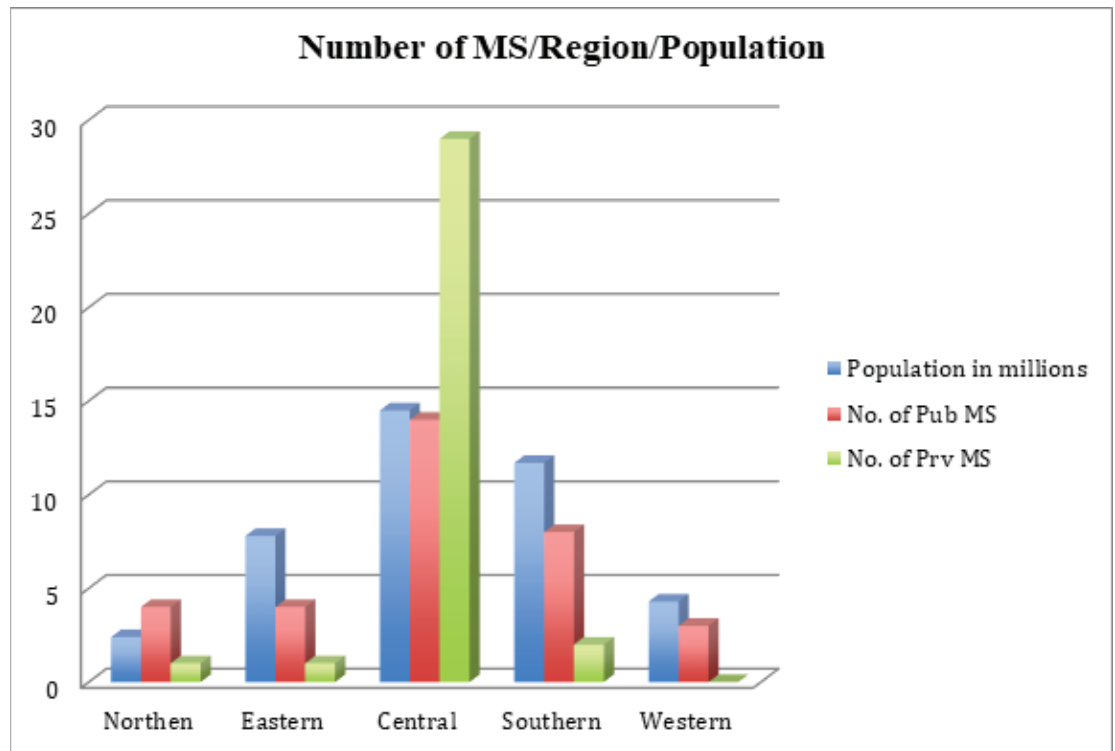


Figure 3: Number of Medical Schools/Region/Population.

## 4. Discussion

Sudanese ME started with one medical school and currently the number reached 66. The course of Sudanese ME can be mapped into four phases based on the concurrent local and global contexts that shaped each phase. Discussion will be under these phases namely, Establishment, Provincial Expansion, Revolution in Higher Education and Quality Assurance & Accreditation. The most relevant global and local factors that influenced each phase will also be identified.

### 4.1. Establishment Phase: 1924-1970es

This is the longest phase, it has been characterized by slow & steady building of capacity, also by great stability [2]; there was only one school. It was thoroughly documented by Haseeb who published his article “Medical Education in the Sudan” in 1967 [13].

Kitchener School of Medicine (KSM), the second medical school with comprehensive syllabus in North Africa [14, 15] 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 Royal Colleges of the United Kingdom. With

independence in 1956 Gordon Memorial Collage obtained the full status of a university; signaling the birth of the Faculty of Medicine, University of Khartoum (FMUoK).

The phase was shaped by the global directions in ME as well as the local sociopolitical factors. Some of them are:

- The 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 clear demarcation between the basic and clinical phases of the program [16], which should be done in teaching hospitals, and schools should abide by a highly selective students' admission process [17].
- 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 – 1950s [18]. Modern health services were introduced in the country since 1902 [14, 15, 19] – but long before that time, between 1863-1866 there was a military hospital in each province of the Turco-Egyptian Sudan (from 1820 – 1885) however, these hospitals were limited to military and government officials [15, 18].
- 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.

FMUoK paid considerable attention to the standard of teaching faculty and the quality of students' training, thus the Educational Development Center was established in 1970.

The above factors might have influenced the quality of graduates and contributed to the good reputation Sudanese physicians continued to enjoy.

## **4.2. Provincial expansion phase: 1970 -1990**

Provincial expansion in higher education started in 1975 by opening two public universities away from the Capital as a step for 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 the medical faculties was to start in 1976 by the same curriculum of FMUoK; but their direction was changed to adopt more innovative programs [20].

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].

Ahfad University for Women (College at that time) historically pioneered in areas such as female education and empowerment, rural development and eradication of harmful traditional practices. In 1990, Ahfad established the first private non-for-profit medical school in Omdurman (Khartoum State), with a 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 [21].

The phase was shaped by:

- The WHO efforts in advancing public health, which culminated in Alma Ata Declaration in 1978. The Sudanese government has committed itself to the declared recommendations and adopted COME in the newly founded schools.
- The rise of constructivist views about learning, resulting in PBL as an efficient strategy for ME.
- The appointment of Prof. Bashir Hamad as the founding dean of FMGU had a great impact on the successful experience with COME. He is a medical educationist and a visionary leader well known for his scholastic contributions to COME and PBL.

By the end of this phase there were four schools, three of them public and one private.

### **4.3. Higher Education Revolution phase: 1990es - 2005**

The launching of the so-called “Revolution in Higher Education” in the early 90es resulted in establishing numerous universities in different parts of Sudan. Some of the stated motives were; increase the number of graduates so as to keep up with the growing population number [22], enhance the development of the different parts of Sudan through establishing State universities, promote context sensitivity through Islamizing and Arabicizing of the curricula; and encourage the establishment of private institutes [12]. It was expected that it will solve the chronic problem of poor distribution of doctors across the country, according to evidence establishing medical schools in distal areas with the inclusion of rural placement component will more likely lead to retention of graduating doctors in rural areas [23, 24].

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 exclusively located in Khartoum - together with eight more public schools.

Sudan strategy of expanding the number of schools and graduating class seemed both wise and reliable as it has been practiced in other parts of the world to deal with similar problems [25].

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.
- United States sanctions on Sudan that acted as a barrier to international scientific interaction.
- Accelerating brain drain, mounting to what was considered a national threat and serious 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 [26]. In the Middle East, including Sudan, privatization of medical schools is mainly for-profit [10]. In principle this is quite acceptable and even welcomed, but in the absence of strict regulatory requirements and transparency, it can easily compromise quality [27].
- Increasing dichotomy between health and education systems and arbitrary distribution of medical schools. Khartoum State hosted 16 schools that competed for almost the same training sites resulting in serious problem for the clinical training.

#### **4.4. Quality Control & Accreditation phase: 2006 till now**

The proliferating of medical schools was not timely paralleled with similar increase in some of the basic resources needed for ME [2]. Authorities in higher education were always very concerned with observing the quality of education, yet formal efforts started to appear in 2000 – which is relatively early in the Region.

Timeline for formal efforts of accreditation

- 2000: the Ministry of Higher Education appointed a Standing Accreditation Committee (SAC). SAC involved different stakeholders from health and education fields besides regional and international organizations. Sudan Medical Council



(SMC) started the Licensing Exam as a means to verify the quality of graduates before permanent registration in the council.

- 2003: “The Model College” document was developed. It described the educational and institutional requirements for ideal Sudanese medical School. The document was based on international standards and local considerations [28] - it was updated in 2012.
- 2004: SMC bylaws with the mandate to set standards for undergraduate medical, pharmacy and dental schools and ensure comparability with regional and international standards.
- 2006: SMC and other national stakeholders formed the National Accreditation Committee, which governs the National Accreditation Program [29]. This program was developed by adapting to national standards, the standards being disseminated by the World Federation for Medical Education (WFME) & WHO as part of a worldwide effort for establishing global minimal requirement for basic ME [2, 28].
- From 2010 to 2012: Implementation of the first round of National Accreditation. The process was carried out for 33 (almost 97% of the schools at that time) medical schools around the country [30].
- 2013, 2014 and 2015: SMC conducted consultative meetings and national workshops attended by experts from the UK and the WFME. These efforts led to renewal of the standards on the basis of the WFME 2013 updated version and the rising national needs. Two concepts were added: Social Accountability and Medical Professionalism.
- 2016: Preparation for the 2<sup>nd</sup> round of accreditation: SMC lead several training workshops for assessors and teaching faculty on the process of accreditation and how to do the self-study.
- 2018: SMC gained international recognition as an accrediting body by the WFME through its recognition program. This program aims at ensuring that accreditation of medical schools worldwide is of internationally accepted high standard. To evaluate the accrediting bodies, WFME uses pre-defined criteria and the number of institutes around the world that gained this recognition is only ten [33]. Two medical schools were accredited after the new status of SMC.

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

- The rise of accreditation culture due to changes in medical practice, health care delivery system, aspiration for quality assurance and the emphasis on humanitarian values. Accreditation is “a process by which a designated authority reviews and evaluates an educational institution using a set of clearly defined criteria and procedures” [31]. The WFME sees accreditation as a process for certifying the suitability of a school and its program to delivering ME using definite quality standards, thus acting as the processes of quality assurance in education [32]. When standards are explained and their exact meaning is clarified, meaningful comparison between ME programs will be possible – this is of course contingent on finding universally approved standards.
- The development of the International Standards for Medical Education by the WHO & the WFME. To deal with important challenges they defined new direction for ME, and advocated for accreditation system that is based on national and regional standards [28]. The international standards were proposed to act as a backbone for integrating the national and regional accreditation procedures [31].
- Signing of the Comprehensive Peace Agreement (CPA) in 2005, that brought promises of 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 ME and the establishment of 25 (76%) new private schools. The majority of schools were in Khartoum.
- Separation of the South in 2011 and the major economic hardship as Sudan had lost great shares of its oil resources. This had direct implications on sectors such as 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 MDGs in 2015 [7].
- Rise in public dissatisfaction from the health system and service providers with increasing incidents of hostilities towards doctors. It can partially be explained by the fact that Sudanese people have one of the highest out of pocket expenditure on health in the Region, about 78% [1]. In return people expect quality service that might not be available due to many reasons; some of them are related to factors that are beyond the classical scope of ME.

Currently there are 66 Medical Schools in the Country, half of them are public and 51.5% of these medical schools are located in Khartoum.

## 5. Conclusion

ME is highly dynamic and regularly needs to be reviewed and reformed. The transformation is driven by some predictable forces including: changes in our understanding of learning, health care needs of the public and new demands required to function in a specific health care delivery system [34]. The required changes may be hindered by challenges related to the delivery of ME or to others that lie beyond the control of the field itself, which make them more difficult to tackle [35].

Sudanese ME has distinguished itself and shown great resilience throughout. This experience needs more documentation and evaluation in order to learn from its shortcomings and celebrate its triumphs. To preserve its legacy and further thrive, it is recommended that all stakeholders work together with this goal in mind. The recent achievement of the SMC in obtaining the WFME recognition can be a stringboard towards launching a true revolution in the face of current challenges. Restorative actions need to be bold, honest, culturally sensitive and transparent to the public.

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