Explore Medical Student's Perceptions of the Implemented Curriculum at Alzaiem Alazhary Medical School: A Cross-Sectional Study

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Abstract
Medical school curriculum evaluation is crucial for ensuring students acquire the necessary knowledge and that programs align with their goals. The complexity of curricula and stringent accreditation requirements heighten the challenge, emphasizing the need for thorough assessment to ensure efficiency and effectiveness. A study at Alzaiem Alazhary Medical School gathered feedback from 1610 students on curriculum, learning, teachers, and academic self-perception. Conducted from September 14 to October 24, 2023, using a validated questionnaire, the study aimed to pinpoint areas for curriculum enhancement. Results revealed a mean age of 21.03±SD 2.667, with over two-thirds being females. Notably, 61.8% agreed on student-centered teaching, and 72.4% found teaching instrumental in their development. About 49.7% acknowledged clear examples from teachers, while 56.8% believed exams met course objectives. Common stressors included lab environments (46.2%) and limited time for research (72.8%). The study underscored the positive aspects of the curriculum, fostering management, communication, teamwork, and independent learning skills. However, identified areas for improvement include the absence of a dedicated research department and reported student stress. Recommendations include revising the curriculum. Despite overall positive student impressions, there's a scarcity of standardized data on faculty perceptions. Future studies should delve into curriculum content, structure, and strategies with more standardization. In conclusion, while the curriculum at Alzaiem Alazhary Medical School has strengths, addressing highlighted issues can enhance its overall effectiveness.

Keywords: Medical School, Perceptions, Accreditation, Curriculum, University of Alzaiem Alazhari, Sudan.

1. Introduction

The term curriculum can be understood as a product of different ways of understanding the relationship between schools, the State, and society. In the current study, the term 'curriculum' relates to a history of national curricula in the Nordic countries as part of nation-building. As such, curriculum is not only a stable body of knowledge by a discipline. It is also about meaning-making and negotiation among different actors in society and the education system, such as politicians, national education authorities, teachers, etc [1,2].

Curriculum analysis is an important task in detecting the validity of assumptions behind the curriculum and assessing its perspectives, goals, and objectives [3].

Curriculum analysis refers to segmenting the curriculum to understand the coherent plan [4]. Medical school curriculum evaluation is essential to Measure student learning outcomes, Determine the effectiveness of teaching methods, Make quality improvements to educational programs, and Comply with and achieve accreditation by the Liaison Committee on Medical Education (LCME). As undergraduate medical education (UME) curricula have become more complex in recent years, and most medical schools are making curricular changes, it is more important than ever to carefully evaluate outcomes to ensure that students are learning the knowledge and skills they need to be successful physicians [5].

Goal-oriented evaluation is essential to ensuring that medical

education programs are high quality and that students achieve all of the program's objectives. This is important because it prepares students to enter the healthcare system as residents and to meet the requirements of the Liaison Committee on Medical Education (LCME) for accreditation. The University of Khartoum and the University of Gezira in Sudan were accredited by the World Federation of Medical Education (WFME) in May 2020, making them the first universities in Africa and the Middle East to do so. This is a significant achievement, and it motivates the other 81 registered medical schools in Sudan to begin the process of WFME accreditation. The first step in this process is to analyze the strengths and weaknesses of their curricula.

However, the effort to accredit medical schools in Sudan has been greatly affected by the complex political situation in the country, which has led to frequent lockdowns of these institutions, sometimes for up to a year. This was further aggravated by the COVID-19 pandemic, which resulted in more than eight months of lockdowns without the availability of resources for alternative solutions, such as online programs. Despite these challenges, the Sudanese government established the Faculty of Medicine University of Alzaiem alazhari in Khartoum State Sudan, to meet the ongoing local and national demand for well-trained medical doctors who belong to their rural environment, have an extraordinary level of community engagement, can persist and act as a team leader for emerging health problems within limited resources. Alzaiem alazhari university has followed the University of Gezira's community-oriented, problem-based curriculum since its inception and has graduated over 3000 doctors who work in various disciplines in Sudan, the Middle East, and around the world [6].

Surprisingly, this curriculum has never been objectively examined since its inception. This research is necessary to keep up with the constant changes in the medical profession and educational context. The goal of this study is to obtain information from Alzaiem alazhari University medical students about their perceptions of the curriculum, to assess general perceptions of learning, teachers, and academic self-perception, and to identify barriers to improving research skills.

2. Methodology

This manuscript describes a comprehensive study conducted at a prominent Sudanese medical school, focusing on the student experience from first-year undergraduates to final-year graduates, excluding recent transfers. The institution, strategically located 40 kilometers from a partnering hospital, offers well-equipped facilities, including lecture halls, a library, a dissection room, a museum, and laboratories dedicated to physics, biochemistry, histopathology, and microbiology.

The curriculum, meticulously crafted over ten semesters, aims to impart extensive medical knowledge and equip students with skills for community service, totaling 231 credits upon completion. A well-structured, 23-question questionnaire, validated by medical education experts and approved by the faculty's research and ethics committee, served as the primary data collection tool. It addressed aspects such as curriculum awareness, teaching methodologies, instructor evaluations, academic self-assessments, and perceptions of the school environment.

A non-probability convenience sampling approach was employed, determining a sample size of 306 students from a total medical student population of 1500, based on a critical value of 1.96, $\alpha/2$ significance level, a margin of error of 0.05, and an assumed sample proportion of 50%.. Collected data, meticulously compiled into Excel spreadsheets, underwent analysis using SPSS 26.0 software. Mean values with standard deviations represented continuous data, while categorical data was summarized with counts and percentages. Missing data points were identified and tabulated for each variable.

3. Results

A total of 1610 students participated in this study. With a mean age of 21.03±SD 2.667. Of them, more than two-thirds were females, and the majority were from the first year (22.4%) followed by the fourth year (16.8%). (Figure 1). A 995 (61.8%) agreed that the teaching is student-centered, and teaching helped them in developing 116(72.4%).

	AGREE		NEUTRAL		DISAGREE	
Teaching Process Among Students:						
The Teaching Is Student-centered	995	(61.8%)	465	(28.9%)	150	(9.3%)
The Teaching Help To Develop Myself	1165	(72.4%)	310	(19.3%)	135	(8.4%)
Objectives, Teacher, And Learning						
I Am Clear About Learning Objective Of Modules And Lectures	1085	(67.4%)	380	(23.6%)	145	(9.0%)
The Technology Is Used To Delivered Information In Classroom	940	(58.4%)	420	(26.1%)	250	(15.5%)
Students Are Actively Involved In Planning And Choice	805	(50.0%)	440	(27.3%)	365	(22.7%
Of Teachers Have Good Communication Skills	675	(41.9%)	625	(38.8%)	310	(19.3%)

Teachers Give Clear Examples	800	(49.7%)	555	(34.5%)	255	(15.8%)
Teachers Are Prepared For Class	905	(56.2%)	475	(29.5%)	230	(14.3%)
Seniors Help Effectively In the Learning Process	1155	(71.7%)	275	(17.1%)	180	(11.2%)
Atmosphere And Lectures						
Atmosphere Is Relaxed During (Lab/Dr/Lecture/Rounds)	595	(37.0%)	490	(30.4%)	525	(32.6%)
Atmosphere Is Relaxed During Seminars/Tutorial	690	(42.9%)	510	(31.7%)	410	(25.5%)
I Can Memorize All That I Need To	565	(35.1%)	615	(38.2%)	430	(26.7%)
My Problem-Solving Skills Are Being Well Develop	940	(58.4%)	425	(26.4%)	245	(15.2%)
[I Am Too Tired To Enjoy Lectures	665	(41.3%)	515	(32.0%)	430	(26.7%)
Curriculum Among Students						
My Curriculum Enhances Patients' Management Skills	1065	(66.1%)	390	(24.2%)	155	(9.6%)
My Curriculum Enhances Communication Skills	1105	(68.6%)	330	(20.5%)	175	(10.9%)
My Curriculum Enhances Research Skills	820	(50.9%)	395	(24.5%)	395	(24.5%)
My Curriculum Enhances Ability Of Teamwork	1140	(70.8%)	305	(18.9%)	165	(10.2%)
Of My Curriculum Enhances Independent Learning Skills	1230	(76.4%)	275	(17.1%)	105	(6.5%)
My Curriculum Is More Time Consuming	855	(53.1%)	445	(27.6%)	310	(19.3%)
My Curriculum Is More Stressful	1045	(64.9%)	400	(24.8%)	165	10.2%)
I Can Ask Questions When I Need To	925	(57.5%)	430	(26.7%)	255	(15.8%)
The Exam Achieves All The Course Objectives	915	(56.8%)	470	(29.2%)	225	(14.0%)

Table 1: Assessment of Curriculum Among Students

In addition nearly half of the participants 800(49.7%) stated that the teacher gave a clear example. fortunately, 915(56.8%) said that the exam did achieve all the course objectives. The rest of the information is shown in Table 1. The most common places with no relaxed atmosphere were Lab 745(46.2%) followed by DR 705(43.7%). The most common reason for not enhancing research skills is the unavailability of TIME (72.8%), and the curriculum is stressful due to the unavailability of time 520(32.2%). Further details are found in Table 2. The present study assessed the level of perception of university students of Alzaiem Alazhary toward their college curriculum. It is worth noting that this was the first time a study was done to assess the available curriculum in the College of Medicine. The study involved 1610 students of which most of whom were female with most of the participants having a positive view of the current Significant difference between males and females were found in the following questions: "Students are actively involved in planning and choice", "relaxing atmosphere in Lecture", "I can memorize all that I need to", "Select My curriculum to enhance research skills" and for "My curriculum is more stressful"
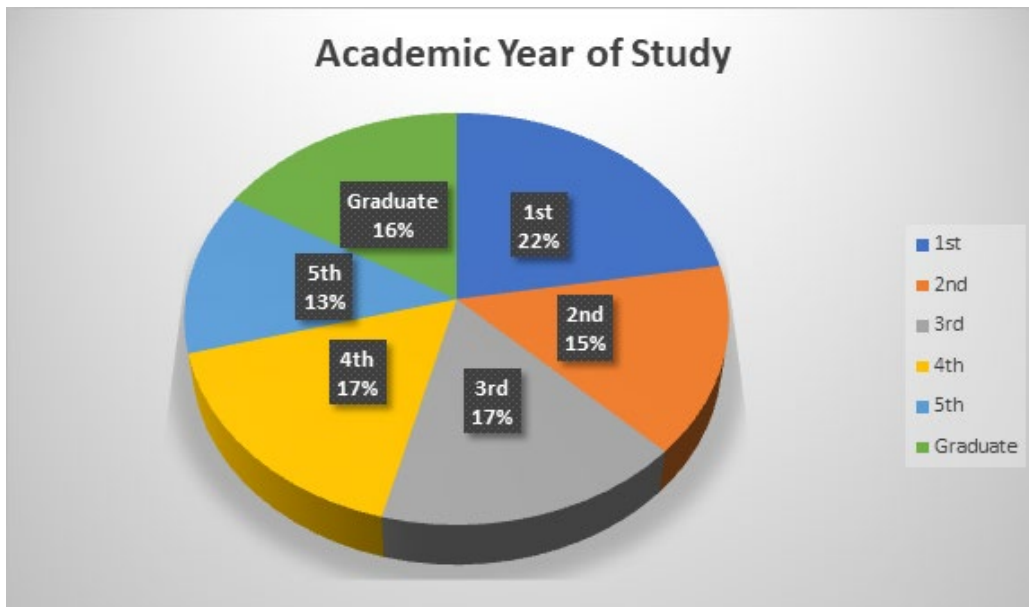
Figure 1: Years of study amongst medical students.

The Atmosphere Is Not Relaxed During (Lab/Dr/Lecture/Rounds)

LAB	745(46.2%)
DR	705(43.7%)
LECTURE	585(36.3%)
ROUND	595(36.9%)
MY CURRICULUM DID NOT ENHANCE MY RESEARCH SKILLS	
NO DATABASE	320(19.8%)
NO RESEARCH DEPARTMENT	305(18.9%)
NO TIME	520(32.2%)
DIFFICULT ACCESS TO DATA	380(23.6%)
NO FUND	395(24.5%)
SELECT MY CURRICULUM IS MORE STRESSFUL DUE TO	
TIME IS NOT ENOUGH	930(57.7%)
ENVIRONMENTAL FACTOR	800(49.6%)
CREDIT HOURS MALDISTRIBUTION	350(21.7%)

Table 2: Responses for Not Relaxing Places and Barriers to Enhance Research Skills

4. Discussion

Curriculum analysis plays a crucial role in pinpointing the strengths, weaknesses, and untapped potential of a curriculum, enabling informed decisions to enhance its effectiveness. This can ultimately produce graduates who are better prepared to serve the healthcare needs of the Sudanese community.*.[3,7,8]. In addition to these direct benefits to the students and community, the importance of curriculum analysis lies also in being one of the accreditation requirements [9,10].

Time constraints and limited access to resources beyond the prescribed curriculum emerged as the primary obstacles to research learning among students. Male participants were more inclined to cite the absence of a dedicated research department, while female students prioritized time constraints as a hindering factor. Remarkably, 26.7% of students, particularly females, reported difficulty retaining acquired knowledge. This challenge could be effectively addressed by incorporating active learning strategies. Furthermore, only 56.8% of students perceived the exam as aligning with course objectives and adequately assessing their knowledge, skills, and values. This suggests that the exam's effectiveness as a learning tool could be enhanced [11].The authors

suggest that the low student performance on the exam could be due to two factors: students' lack of deep understanding of the course objectives, as only half of them, were clear about certain module objectives; and the exam being written by different staff than the original teachers [1,2].

To address these issues, the authors recommend the following:Teachers should present a clear educational objective for each module before it is started, as well as a clear and comprehensive title and learning outcomes for each lecture. Content validity should be maintained by using the table of specifications to ensure that the exam covers the same topics as the course objectives. Exam discrepancies and student perceptions are different. Exam content misalignment Students may have struggled with the exam due to a lack of clarity regarding the learning objectives. This could be addressed by providing clear educational objectives for each module and lecture, along with comprehensive titles and learning outcomes. Content validity concerns The exam's alignment with course objectives should be ensured using a table of specifications. This will guarantee that the exam effectively assesses what students have learned.

Student involvement in decision-making While most students perceived the education as student-centered, a significant portion indicated a lack of involvement in decision-making. This suggests a potential disconnect between student perception and the actual implementation of student-centered practices. Gender-based differences in perceptions Male and female students exhibited varying perceptions regarding the stressfulness and relaxation levels of certain aspects of the college environment. This could be attributed to gender-specific emotional processing styles. Teacher communication effectiveness Clear and effective communication is crucial for successful teaching. The survey findings indicate that students generally perceive their teachers as well-prepared and capable of delivering clear information [1,12,13]. We also Recommend Provide clear educational objectives and learning outcomes for each module and lecture.

Ensure exam content aligns with course objectives using a table of specifications. Foster genuine student involvement in decision-making processes. Address gender-based differences in perceptions through targeted interventions.Emphasize the importance of clear and effective communication among teachers. Along with teachers, seniors also play an influential role in helping their juniors understand difficult scientific concepts, which is why a good relationship between joiners and seniors is an important quality of a good educational environment. Fortunately, a large percentage of students involved in this study 1155(71.7%) reported that their seniors help them in their educational activities in some way or another. Studying medicine involves participating in many stressful activities; like participating in the lab, dissection room (DR), lectures, and rounds. Understandably Lab was the most stressful as reported among 745(46.2%) of students, followed by DR as stated by 705(43.7%)of the students. This level of stress could explain why most of the surveyed students 1045(64.9%) expressed

a sense of exhaustion and lack of enjoyment during lectures. This is inconsistent with a study done in Sudan14 and others performed in Saudi colleges,1 which could be due to differences in learning environments between the involved universities [14–16].

Furthermore, problem-solving skills are deemed an indispensable component of the curriculum, nurturing critical thinking in students for future endeavors.3 Notably, problem-solving necessitates the integration of basic and clinical sciences,18 a practice that could potentially enrich the learning environment for students [17–19]. Positively, 940(58.4%) of the students expressed satisfaction with the development of their problem-solving skills, aligning with previous findings [3].

Concerning the curriculum, 1065(66.1%) of the students acknowledged an improvement in their management skills, 1105(68.6%) in their communication skills, a critical aspect of professionalism, 1140(70.8%) in their teamwork ability, and 1230(76.4%) in their independent learning skills. Negative perceptions should be addressed by key stakeholders, such as establishing a dedicated research department within the college, increasing its emphasis in the curriculum, and thereby enabling students to acquire effective research skills.

Additional challenges to the curriculum, including stress and time constraints, can be mitigated through regular revisions and time management techniques. reforming the curriculum by the curriculum committee, Eliminating unnecessary information, and aiming to create a more student-centred, curriculum through proper use of modern pedagogical approaches [1]. Such curriculum models are found to be successful when applied in other local universities like (FMUG) for example in Sudan, also in the Faculty of Medicine and Health Sciences, University of El Imam El Mahdi [11,21].

Curriculum revision is necessary because of the continuing changes in the healthcare system and subsequently in their demands [22]. The overall perception of the students in this survey seems to be a positive one, with most of the students having favorable views about the different aspects of the curriculum. This finding is consistent with a previous study that was performed in Sudan as well as other studies done in India, Sweden, Australia, British School of Osteopathy, Saudi Arabia (Umm Al-Qura University in addition to King Abdulaziz University) the United Arab Emirates, Kuwait, Canada [22,25-30].

Conclusion
The present study highlighted the perceptions of medical students towards the implemented curriculum at Alzaiem Alazhari Medical School. Also evaluated the curriculum of the Faculty of Medicine University of Alzaiem Alazhari in Sudan we found that the curriculum is effective in developing students' management, communication, teamwork, and independent learning skills. However, there are some areas for improvement, such as the lack of a dedicated research department and the high level of stress

reported by students. The authors recommend that the curriculum be revised to address these issues. Interestingly, similar data is limited in the literature concerning the faculty Although, most students have a positive impression of the local curriculum, learning, and engaged teachers. However, more studies with more standardization and specification regarding curriculum content, curriculum structure, and strategies, should be conducted in the future.

Declaration of Interest Statement
Funding
This study received no funding.

Availability of Data and Materials
The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate
Ethical approval of the study was obtained from the IRB committee in the faculty of medicine, University of alzaiem alazhari , Khartoum, Sudan. The study was carried out following the relevant ethical guidelines and regulations. The participants were asked to give consent that they agree to participate in the study by filling out the questionnaire for research purposes, and all the participants provided informed consent.

Consent for Publication
No personal data was collected from the participants.
Competing Interests
The authors declare that they have no competing interests.
Authors Contributions
All authors contributed equally

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