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Analyzing the social aspects of the integrated program of field training, research, and rural development course, Faculty of Medicine, University of Gezira, Sudan

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Abstract:

INTRODUCTION: Social factors such as culture, race, education, belief, and living and working environment can be part of the causes of diseases or influence the natural history of a disease.

MATERIALS AND METHODS: We have adopted the Harden's ten questions of curriculum development framework approach to assess the social impact of medical curriculum of Faculty of Medicine, Gezira University (FMUG), among the Integrated Program of Field Training, Research, and Rural Development course. We have assessed the objectives and aims of the course and critically analyzed how these will meet the need for social sciences to be integrated into the curriculum.

RESULTS: The recommendations about social and behavioral sciences are well implemented in the curriculum of FMUG. The curriculum promotes early exposure to the community learning. The ten questions of Harden for curriculum or course assessment are satisfactorily covered in the Integrated Program of Field Training, Research, and Rural Development course at FMUG. In addition, the course is also fitting well with criteria suggested recently for increasing competency in social medicine within the medical school curriculum. Importantly, the course is part of the social sciences that well integrated through the duration of the curriculum.

CONCLUSION: The Integrated Program of Field Training, Research, and Rural Development course at FMUG satisfy most of the competency for social medicine. Therefore, taking all these factors into consideration, it is possible to suggest that further research is needed to establish whether the model of FMUG in social sciences can be exemplary for universities in Africa and the Middle East.

Keywords:

Curriculum, Faculty of Medicine, social science, Sudan, University of Gezira

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Introduction

Social factors such as culture, race education, belief, and living and working environment can lead to developing diseases and may also influence the course of the disease. Therefore, for medical schools, it very important to include courses that deal with behavior and social aspects of disease in the curriculum

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for undergraduate.^[1,2] For instance, water-borne diseases can spread quickly if individuals in that particular community are not using water and drainage system in a hygienic way. In addition, certain genetic diseases are known to be more common in certain ethnic of the population, that is, sickle cell anemia in West of Sudan. Certain infectious and sexually transmitted diseases can be related to the behavior and attitude of the individuals. Noncommunicable diseases such as obesity can also directly or

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indirectly related to social factors such as excess energy intake and salt intake. In addition, noncommunicable diseases were highly prevalent in societies where social events were celebrated where food high in fat and sugar are likely to be served. Since the establishment of the Faculty of Medicine, University of Gezira (FMUG) in 1975, the vision at that time the medical school will produce graduate to serve the local community in Gezira state. The FMUG was a pioneer in the spiral curriculum in Africa and Middle East (integration of knowledge, topics discussed at different stages in the curriculum, and student centered).^[3-6] Social sciences in FMUG are also taught during the learning of students in community-related courses which spread across the 5-year curriculum.^[7]

The curriculum included three community learning courses that teach social factors, namely, the interdisciplinary field training, research, and rural development (recently named Integrated Program of Field Training, Research, and Rural Development course), the family attachment program, and the primary health clerkship.^[1] The Integrated Program of Field Training, Research, and Rural Development course based on the identification of main health problem of a village or locality by a group of medical students, the recommendation of appropriate solutions, and evaluation.^[3-6,8] The family attachment program is based on the identification of one health or social problem for one family. There is a false impression among medical professionals that a community-oriented and problem-based learning (PBL) will only work in low-resource setting countries and medical schools in Africa. On the contrary, Chastonay *et al.* showed that the 15-year experience of Geneva Medical School (Switzerland) in both PBL and community-oriented curriculum have shown increased collaborative spirit among medical teachers, high students' satisfaction, and success at certifying examinations.^[9] The authors concluded that the evaluation enabled them to assess the degree of interaction between the community and students and whether any educational innovations or new developments of the curriculum can be introduced. I will adopt the Harden's ten questions of curriculum development framework approach to assess the social impact of medical curriculum of Gezira University among the Integrated Program of Field Training, Research, and Rural Development course.^[10,11] The ten questions are the need about the product of training, aims and objective, content, the organization of the content, educational strategies, teaching methods, assessment, details of curriculum communicated, educational environment, and how the whole process should be managed. The Harden's ten questions of the curriculum are documented to provide qualitative, descriptive analysis for curriculum and widely used in

the development of a course in medical school. These ten questions provide a checklist and can provide like quality assurance before introduction or design of any course. Therefore, the course has to address all these ten questions successfully. Importantly, this tool provides good reliability and validity. Harden's ten questions are widely used, and it was cited in >280 publications. In addition, in almost all books of medical education, the Harden's ten questions are mentioned in the section that deals with curriculum design. The Harden's ten questions are a useful tool of assessment of course or curriculum, well validated, successfully used around the world, and easy to follow. Harden developed these ten questions in 1986, Dundee University. Technology and the digital world have changed the world in dramatic ways since 1986. Perhaps, other questions may need to be added as knowledge transfer, and exchange of ideas become more convenient in the current world. One of the questions need to be added is the transferability of the course. In the following discussion, we will see that some courses adopted by the FMUG were transferred to other universities inside and outside Sudan. Importantly, if the course can be transferred to other society or culture, the second question needs to be added is what impact this course has in that new environment or society.

The reason why choose the Integrated Program of Field Training, Research, and Rural Development course because it is a course that starts from the 2nd year to the 4th year in the medical school, topics are revisited with different approaches which lead to the integration of information in particular about social aspects of diseases. In addition, this course is based on reflection, teamwork, and emotional intelligence.^[8] The vision of FMUG is to provide the student with competence in social sciences. In other words, rather than focusing only in teaching basic and clinical sciences (biomedical curriculum), the vision of FMUG was on combining social and behavioral sciences with teaching clinical and basic sciences (biopsychosocial curriculum).

The Ten Questions of Harden's About the Establishment of the Curriculum

What are the needs about the product of the training program

The FMUG aims to produce doctors that able to work in rural and urban areas and if needed around the world. This course in rural research and development program provides rich and integrated materials that equip graduates with skills in leadership, management, social skills, and research skills based on the need of the community. Therefore, medical students will have early exposure to the needs of the community in rural areas to develop social skills and develop practical knowledge about epidemiological studies. This may explain in part

why FMUG is one of the leading medical school in the field of social accountability of medical school.^[7]

What are the aims and the objective

Perhaps, in 1975, when the Faculty of Medicine, Gezira University, was established the quick and correct easy guess was that there was a high prevalence of communicable disease. Therefore, the establishment of the rural and research program will also help in decreasing and containing the prevalence of communicable disease in and around the areas of Gezira states. This is in accordance with the Delphi technique which is widely used to identify learning outcomes. Recently, the number of patients admitted with noncommunicable diseases in one hospital in Sudan exceeded the number of patients admitted with communicable diseases such as malaria and typhoid.^[12] Therefore, there is a need to train physician with skills in managing communicable and noncommunicable disease in rural and urban areas. Importantly, one of the ongoing plans of FMUG is to open a center dedicated for noncommunicable disease. Part of the objective of the curriculum is to train a physician in the community, promote leadership, early exposure to needs of the community in rural and urban areas, and encourage research according to the need of the community. It is expected that by increasing knowledge of graduate in this field, providing them with the necessary skills; this may ultimately change their attitude and approach in dealing with health and social problems in the community as doctors in the future. Furthermore, the training of physician in research according to the need of the community made FMUG, one of the pioneers and leader in the field of social accountability and founder of THEnet (Training for Health Equity Network organization) (<https://thenetcommunity.org/>).^[7] THEnet is an international organization that promotes social accountability across different universities around the world and increases collaboration between its members.

The benefit of this rural field research training program of FMUG was acknowledged in “practical guide for medical teachers”, fifth edition, 2017. For instance, Rourke *et al.* mentioned that FMUG developed the rural training program that served more than 300 villages and more than 1500 families. They also praised this program for a significant reduction in maternal and neonatal mortality rate.^[13] In the recent curriculum, the program was modified in two phases. This was achieved after focus group discussion with stakeholders, using the Delphi technique and interview with recent graduates. In summary, the primary education outcome of the rural program is to produce socially skilled doctors that will serve the local community, their country, and if needed the world. Besides the skills in dealing with the communicable and noncommunicable disease in the

community, the program equips students with the skill to do research according to the need of the community.

What content should be included?

One of the unique features of the curriculum of FMUG is the fact that it is an authentic curriculum. In other words, it is outcome-based approach curriculum that connects the learning in the medical school with real-world issues, problems, and applications.^[14,15] This demonstrated in the Integrated Program of Field Training, Research, and Rural Development course. The knowledge, skills, and attitudes that students gain during this course connect the graduates with the reality of the practical life and prepare them to deal with the situation scientifically and professionally. The students will learn about the social aspects of the disease, communications, traditions, and habits of different ethnic groups about communicable and noncommunicable disease. Therefore, the content of the course is of relevance to the student. It is well established that the increase in engagement of student will increase exponentially as long as student feels that the materials taught in the curriculum is of relevance to his career.^[16] Taking all these factors into consideration, it is possible to suggest that Integrated Program of Field Training, Research, and Rural Development course meet with four features of authentic curriculum established by Rule,^[17] for example, the experience in the real world, opportunity for the student to experience a higher level of thinking as they learn, authentic learning during community works, and importantly, it is student-centered learning. However, Harden and Laidlaw (2017) raised concerns with the authentic curriculum (integration of knowledge, learning perceived as inefficient, students may feel incompetent, and teachers may not have the correct experience).^[16] These concerns can be taken into consideration when students are learning about clinical and basic sciences. Being a graduate of the FMUG, my reflection into these concerns are based on the following points: the curriculum was a spiral curriculum and the rural course is presented after two courses in sociology and statistics. Furthermore, the program is designed to allow a group of students to identify the main health problem of the village and then to implement a solution to the problem. Finally, the students will perform assessment and evaluation in year 4. My impression and impression of my colleagues at that time, this course *per se* had achieved its targets and beyond (as some graduates are national and international leaders in public health medicine, medical education, and family medicine). It is possible to mention that the delivered or actual curriculum (the reality of what students are learning or experiencing) is almost matched with the planned curriculum (documented and agreed by the curriculum planners). Part of the learned curriculum is hidden curriculum (this can be knowledge, skills, attitudes, and beliefs that are not part of explicit intentions of

those planning the curriculum). For those students with aspirations to specialize in community and public health medicine, it is part of the hidden curriculum; they need to present their data on national and international community medicine conference. It is worth mentioning that graduates of the FMUG specialize in all branches of medicine and considerable numbers are high-level specialists in charge of specialized units inside Sudan and abroad (USA, Canada, Australia, and the UK). For me personally, the early exposure to such course has shaped different aspects in my career (knowledge transfer to my home country, medical education, charity work, public health initiative projects and developed a particular interest in geriatric medicine, and HIV metabolic medicine beside diabetes and endocrinology in the UK).

How should the content be organized?

From the above narration, it is evident that the curriculum is spiral one with an option for students to learn and gain skills in epidemiology, sociology, teamwork, leadership, and emotional intelligence. Importantly, before the students start phase 1, he or she will study sociology in the previous semesters. For example, the student will learn a course about professionalism and professional ethics in Semester 1 and medical statistics in Semester 2 (year 1). The student will learn a course about the doctor and his community in Semester 3 (year 2) just before starting the course of Integrated Program of Field Training, Research, and Rural Development in Semester 4. Therefore, the student will start this program with knowledge in sociology, epidemiology, and community medicine^[18] (FMUG curriculum, 2008).

What educational strategies should be adopted?

The curriculum in FMUG is student-centered, presentation-based, integrated, community-based, elective-driven, and systematic model. In addition, the curriculum also adopted PBL, community-based learning, integration, teamwork, early community and clinical exposure, and training of students in teaching hospitals and primary health-care centers, and staff development.^[3-6] For the Integrated Program of Field Training, Research, and Rural Development course, the educational strategy is community-based education.^[1,3]

What teaching method should be used?

For the Integrated Program of Field Training, Research, and Rural Development course, the students will learn from different methods of teaching such as visits to the villages, preparing instruments for data collection, planning of the village visit, management of the whole course in the village, a collection of data, analysis, and reporting result, teamwork and Powerpoint presentation. Therefore, this is student-centered learning. The main educational methods are village visit, basic

epidemiological research methods, report writing, teamwork and presentation, and discussion.^[3-6]

How should assessment be carried out?

It worth mentioning, one of the hurdles with community-based learning is an assessment of student competence and progress. The best strategy will be to use different means or tools of assessment. This was validated and proved to be reliable by researchers from FMUG.^[19] Examples of different tools of assessment were short essay questions (SEQs), multiple-choice questions (MCQs), peer assessment, a supervisory checklist, community feedback, and reports from students.^[19]

How details of the curriculum should be communicated?

Teachers in medical school are well informed by the curriculum. The integration of courses and curriculum requires input from different specialties.^[10] This course is supervised by staff from different specialties (public health and community physicians, internal medicine physicians, microbiologists and infectious disease consultants, a specialist in medical education, gynecologist and obstetrician, and pediatrician). The importance of having staff from different specialties is the fact that different community problems will receive special attention and review. This proves to be of numerous benefits to the teaching staff. For example, the staff has an excellent opportunity to learn and be updated about the prevalence and the course of communicable and noncommunicable disease in the region. Importantly, staff with no formal qualifications in public and community medicine developed a genuine interest in this field are able to develop a track record in research in medical education and community medicine.^[2] Therefore, it is possible to suggest that PBL and community-oriented curriculum comes with a benefit not only for students but also for the medical staff (this can also be regarded as part of the hidden curriculum). Students are well informed by the curriculum as they received a printed handout about the course objective, outcome, learning methods, and assessment. Students are also part of the ongoing reform of the curriculum as they will be asked to fill feedback questionnaire about the course.^[2]

The curriculum and this course are also shared with educational researchers and curriculum planners. For this reason, FMUG established the Education Development Center (EDC) in 1975. After several years in education and research, the center was recognized as a national center and designated as a WHO collaborating center in 1995. The EDC works closely with health authorities in Sudan such as Federal Ministry of Health, State Ministry of Health, EDC Khartoum University,

International Health Office, WHO, other medical schools in Sudan, and other faculties in the University of Gezira. Importantly, the EDC has strong international links and collaboration with different universities such as Dundee University, George Washington University, Suez Canal University in Egypt, McGill University in Canada, and Maastricht University.

The EDC is recognized as a leading education center in Africa and the Middle East, and this may explain why most of the medical schools in Sudan (some medical schools in Africa and the Middle East, e.g., University of Science and Technology, Yemen) adopted the strategies of FMUG (curriculum website of FMUG). It is worth mentioning that FMUG was awarded two prestige prizes: the Islamic Development Bank Prizes for Science and Technology in 2017 (Saudi Arabia) and Hamdan Award for the Best Medical College/Institute or Center in the Arab World 2001–2002 (United Arab Emirate).^[20,21]

What educational environment or climate should be fostered?

The concept of learning environment is very important in medical education, and it is defined “as everything that happens in the educational institute.”^[22] Furthermore, there is a link between a positive learning environment and student clinical, academic, and emotional intelligence. It is also essential that student perceives the learning environment in a positive way as this was strongly linked with higher achievement. Furthermore, the Dundee Ready Education Environment Measure (DREEM) is most commonly, a reliable and valid tool used around the world to assess the learning environment in a health profession institute. This tool was developed by an International Delphi Panel in Dundee, Scotland.^[23] Interestingly, Ahmed *et al.* showed that the overall score of the learning environment in FMUG was 122/200 (standard deviation [SD] = 16.6) using DREEM. This was found to indicate a positive perception of the learning environment according to the DREEM. The overall mean score was found to increase significantly as student progress from Semester 2 to Semester 10 (the final Semester). Furthermore, those students with high academic achievement showed that mean DREEM score was 126 (SD = 24.4), whereas low-achieving students’ mean DREEM score was 102 (SD = 26.25).^[24] It is possible to conclude that the learning environment in FMUG promotes learning, research scholarship, and development.

How the process should be managed?

There is a robust system for the management of courses that are taught for undergraduate and postgraduate at FMUG. This is directly managed by the university senate, dean of the faculty of medicine, faculty board, curriculum committee who are members of EDC. The

course is also managed mainly by the community and public health physician as well as specialist in medical education. The role of students in participation in feedback and curriculum development is of immense value to the FMUG and in particular in this course. It worth mentioning, in the revised curriculum of FMUG, the Integrated Program of Field Training, Research, and Rural Development course was decreased to two phases rather than three phases, but the hours remained the same. This demonstrates a reflection of adaptability, resilience, and flexibility of the curriculum of FMUG. It also reflects the desire and vision of the staff at FMUG to maintain a high standard and to be receptive and adaptable to continuous global changes in medical education.^[1,3-6,8,25]

Discussion

In a systematic review by Carney *et al.*, it was concluded that more measurement validation and testing in association with well-designed studies are needed to understand how educational strategies contribute to behavioral and social sciences competency development.^[26] Several researchers suggested models that will help in improving competency development for behavioral and social science. For instance, Vanderbilt *et al.* recommended that medical students exposed to underserved communities are likely to serve that community after graduation, the curriculum should include ongoing social medicine component, integration of social science with clinical, and importantly, students should be encouraged to do self-reflection. The authors claimed that self-reflection is an essential component in developing competency in social sciences.^[27] Westerhaus *et al.* discussed the necessity of social science in the curriculum of the medical school, and they suggested three models. The first model is an organization that promotes social medicine, the second model is a 1st-year social medicine course, and the final model is a 5-year curriculum that fully integrates social medicine.^[28] The recommendations of Vanderbilt *et al.* and Westerhaus *et al.* (2015) are well implemented in the curriculum of FMUG. For instance, Gezira University as an organization promotes community and social sciences learning not only in the faculty of medicine but also other faculties such as dentistry, pharmacy, and agricultural. The curriculum in FMUG promotes early exposure to the community as a student the rural training program from Semester 4. This clearly indicates the need to introduce social sciences at an early stage of the FMUG curriculum (questions 1 and 2 of Harden’s). This can be seen in the objectives and aim of the Integrated Program of Field Training, Research, and Rural Development course. While in prior semesters, the student will learn about Psychology, Medical Sociology, Statistics, and Epidemiology. Importantly, FMUG has integrated social

sciences across the 5-year curriculum (questions 3 and 4 of Harden's). For example, the effects of socioeconomic, demographic, and cultural objectives are included across the curriculum. For instance, sociodemographic features of common diseases of relevance to practicing physician in Sudan like sickle cell anemia, tuberculosis, liver cirrhosis and relation with schistosomiasis (bilharzia), female circumcision and obesity and diabetes are taught across the five years curriculum. Community medicine course and infectious disease course cover issues in relation to nutritional habits and taboos, water-borne diseases, family planning, smoking, occupational diseases, the role of traditional healers, and wrongly believe in certain diseases. The Integrated Program of Field Training, Research, and Rural Development course will be covered in two phases in the new curriculum (year 2 and year 4), this may allow students to develop further skills in approaching and learning about social aspect of medicine. The curriculum is spiral one and educational strategies are largely based on both students centered teaching and community-based approach (questions 4–6 of Harden's).^[3-6,18] One unique feature of this course is fact that it is managed by staff with different specialties, and this *per se* will allow students to interact and learning from different approaches to different problems. Another unique feature of this course is different tools of assessment used at the end of the course (SEQs, MCQs, peer assessment, a supervisory checklist, community feedback, and reports from students)^[19] (questions 7 and 8 of Harden's). The Integrated Program of Field Training, Research, and Rural Development course proves to be successful as the FMUG has provided the excellent environment for learning and education and significant research were published about medical education in the faculty of medicine. It is worth mentioning that communication skills are taught through the curriculum with particular emphasis during the clerkships (questions 9 and 10 of Harden's).

Conclusion

The ten questions of Harden for curriculum or course assessment are satisfactorily covered in the Integrated Program of Field Training, Research, and Rural Development course at FMUG. In addition, the course is also fitting well with criteria suggested recently for increasing competency in social medicine within the medical school curriculum (the course is well supported by Gezira University, taught in early years in the medical school, the course is taught through phases during the 5-year curriculum, and students are encouraged to reflect and discuss their results). Importantly, the course is part of the social sciences that well integrated through the duration of the curriculum. It is worth mentioning that the Institute of Medicine (IOM) concluded that due to the

insufficient teaching of social sciences in medical schools, 50% of premature mortality and morbidity are due to behavioral and social factors.^[29,30] The IOM reported the critical social factors are mind–body interaction, patient behavior, physician behavior, physician–patient interactions, social and cultural issues and health policy, and economics. This recommendation of IOM was endorsed by leading educational and scientific organizations such as the Association of American medical colleges, the Canadian medical education direction for the specialist framework, the Accreditation Council for Graduate Medical Education, and the Liaison Committee on Medical Education.^[31-34] Therefore, taking all these factors into consideration, it is possible to suggest that further research is needed to establish whether the model of FMUG in social sciences can be exemplary for universities in Africa and the Middle East. This is also important as lack of standardization is one of the reasons of difficulty to collect information or data about different training models for social science curricula.^[26]

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Conflicts of interest

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