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ORIGINAL RESEARCH REPORTS

Impact of Community-Based Medical Education on Graduate Performance: A Qualitative Study Using a Critical Incident Technique

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Abstract

Purpose: This study aims to explore the impact of community-based education on graduates' work performance and career paths in later life.

Methods: A self-administered critical incident questionnaire was given to a group of graduates from a community-based medical school. The target population was the graduates of the Faculty of Medicine in the University of Gezira who graduated between the years 1984–2021. Participants responded using audio recording or in writing and reported on 'critical incidents' they had experienced. Data was analysed using thematic data analysis to develop codes, categories and themes from the critical incident techniques.

Results: Twenty-three critical incidents were reported from a total of 91 responses yielded from the recorded and written data. Most of the incidents take place in the Interdisciplinary Field Training, Research and Rural Development Programme, as well as in Rural Residency, Primary Health Care Centre Practice, and Family Medicine. From the reporting of the critical incidents, five themes were identified concerning the benefit of community-based education in learning at undergraduate level: leadership, care of patients, professionalism, personal development and belonging. Similarly, five themes demonstrating the impact of community-based education after graduation were also identified including improving patient care, improving health system practice, curriculum development, self-improvement skills, and family medicine practice.

Discussion: Community-based education was shown to have a positive impact on students learning at undergraduate and post graduate level. Community-based education is also associated with the development of essential skills required by medical doctors after graduation. Structured community-based education is needed to maximize these benefits.

Keywords: Community-based education, Medical education, Professionalism, Leadership, Health systems

1. Introduction

Community-Based Medical Education (CBE) is an educational strategy which provides opportunities to train students within a real-life environment. It allows students to learn about health issues within community settings and increases

bonds between colleges and the communities they serve [1–3]. The rationale for adopting CBE is it is a way of benefitting society through relevant, cost-effective and evidence-based medical education [4].

In CBE, medical schools use the surrounding community as a learning environment to ensure there is interaction between those who are concerned with the educational process, students,

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teachers, health system and community members, to address relevant community health needs in the curriculum [5].

Other expected benefits of CBE are that students will learn about leadership, communication and team-work skills [6,7]. It is also reported that CBE increases students' levels of interest in pursuing future careers related to primary healthcare [8].

Despite the large body of literature on CBE, few studies address the impact of learning within community settings on graduates' subsequent life and career paths [9–11]. Therefore, this study aims to explore the impact of learning that took place within a CBE setting on graduates' performance and career later in life. The study was conducted at the Faculty of Medicine, University of Gezira (FMUG), Sudan, which is a community-oriented, community-based and problem-solving school established in 1975 [12].

All courses in FMUG curriculum include CBE activities, however, ten courses are taught directly in community settings such as the Interdisciplinary Field Training Course (three courses in three phases), the Research and Rural Development Programme (three courses in three phases), Primary Health Care Health Centre Practice and Family Medicine-Phase I, Rural Residency, and Health Management and Leadership. Table 1 shows these courses with their duration in weeks and the credited hours [5,13,14].

2. Methods

2.1. Overview

This is a qualitative cross-sectional study. The data were collected using critical incident techniques (CIT), which are defined by Flanagan [15,16] as 'a set of procedures for collecting direct observations of human behavior in such a way as to facilitate their potential usefulness in solving practical problems'.

2.2. Participants

The target population of the study was the graduates of FMUG who graduated between the years 1984–2021. 18 of them were male and six were female. Twenty one of the participants were from the clinical practice and three of them were from the academia.

2.3. Procedures

Participants were invited to take part in the research through a representative from each batch of graduates; they used (mainly) the invitation through the private WhatsApp groups used by each batch. Data were collected electronically using a software program (<https://www.phonic.ai/>). Participants had the option of recording or writing their responses.

2.4. Materials

Participants reported the critical incidents (CI) as follows: they were asked to recall an incident that occurred during their community-based education activities (health centre visits, family visits, village visits etc.), and to describe exactly what happened, when it happened, who was/were involved, what they learned from the incident, and how the learning from the incident has benefited them in their work. Box 1 shows the questions that were used in the data collection form.

2.5. Analysis

The recorded data was transcribed, word by word, by two of researchers independently and then analysed using thematic data analysis to develop the codes, categories and themes from the CITs. The work was first completed by two authors (each one individually) and then reviewed by two other authors.

Table 1. The parts of the curriculum which are taught directly in community settings (n = 10).

Course	Code	Weeks	Credit Hours
Introduction to Medicine and the study of Medicine	MED111	2	2
Professionalism and Professional Ethics	MED124	3	2
The Doctor and His Society	MED211	3	3
Primary Health Care Health Centre Practice and Family Medicine-Phase I	MED221	Longitudinal	4
Interdisciplinary Field Training, Research and Rural Development Programme (Phase I)	MED224	6	6
Primary Health Care Centre Practice and Family Medicine (Phase II)	MED311	Longitudinal	4
Primary Health Care Centre Practice and Family Medicine (Phase III)	MED321	Longitudinal	5
Interdisciplinary Field Training, Research and Rural Development Programme (Phase II)	MED326	3	3
Rural Residency	MED406	3	4
Health Management and Leadership	MED501	4	5

Box 1. Questions used to help the students to recall critical incidents in CBE that were related to their practice.

1. Batch (.....)
2. Year of graduation (.....)
3. Gender (.....)
4. Where are you in your career journey (.....)?
5. What is your specialty (.....)?
6. Think of an incident which you experienced during your community-based education activities (health centre visits, family visits, village visits).
7. Tell us (describe) precisely what the incident was and during which activity (health centre, family visit, village visits)?
8. What was your role in the incident?
9. Who was/were involved in that event (please mention them anonymously, e.g. colleague, community member, doctor, etc.)?
10. Describe your feelings at the occurrence of the incident.
11. What did you learn from that incident?
12. Describe how what you learnt from that incident has benefited you in your work after graduation?

The authors familiarised themselves with the data through reading and listening to the responses, and then generated initial codes by highlighting some of the common words and meanings, then the final codes were generated. Out of the codes, themes were identified and defined. Then, the themes generated by each of the two researchers were compared and reviewed to reach a consensus definition for each of the themes. The final document was subsequently shared with the two reviewing researchers and the final results were written up.

3. Results

Twenty-three critical incidents were reported from participants who graduated between 1986 and 2018. A majority of the incidents took place in the Interdisciplinary Field Training, Research and Rural Development Programme followed by the Rural Residency, and Primary Health Care Centre Practice and Family Medicine. Various positive and negative feelings were reported within these incidents (Fig. 1).



Fig. 1. Word clouds of graduate feelings.

Five themes were identified from the critical incidents related to the effect of CBE and the benefits students gained before graduation, which are leadership, caring for patients, professionalism, personal development and belonging. Table 2 below summarises the codes and themes generated, along with illustrative examples of the incidents.

Our study outlined another five themes demonstrating the Impact of CBE on graduates' performance after graduation, these themes were improving patient care, improving health system practice, developing personal skills, family medicine practice and curriculum development. Table 3 summarises the codes and themes generated, along with examples of the incidents.

4. Discussion

This study aimed to explore the impact of CBE learning on graduates' future career performance by using critical incident techniques. The study showed that CIT can help in providing a picture of how CBE can impact the practice of its graduates. It also confirms the validity of CIT as it has been used before in medical education [16,17], for example, to ascertain good professional practice, to develop graduate competencies, to evaluate educational programmes, to explore preparedness for practice and to foster reflective learning [18–21]).

The current study showed that CBE has helped the graduates in acquiring important competencies such as leadership, communication skills and teamwork skills. This research's findings are in agreement with previous studies conducted in Sudan, which demonstrated that CBE supported the students in enhancing their communication skills, teamwork and leadership skills [7]. Studies in Malaysia and South Africa [13,22] also reported that CBE could be linked to improvement in these competencies. The graduation of a doctor with

Table 2. Summary of benefits of CBE on learning before graduation.

Themes	Codes	Examples of incidents
Leadership	<ul style="list-style-type: none"> • Capable of completing tasks • Planning problem solving • Importance of teamwork • Crisis management • Leadership skills 	<p>'I remember that during the interdisciplinary field research and training, it was phase three it was in the year 1992, I think. And this was our last phase, but due to the rainy season, the college bus stopped in the centre of Mashaniq Brahim Village and then we had to walk like 10 km to reach our final visit. making sure that Temari collection and do during our coming back Jeremy really starts to the disk I stopped raining and it wasn't raining it was actually pulling So, we were in the middle of nowhere during heavy rains and floods. Then out of nowhere, came an old farmer with his son, and they were taking shelter below a tree covered with sacks empty. They called to us feebly and we stayed with them together for a couple of hours till the rain stopped and then we continued walking till Mashaniq Brahim Village. We were terrified, very hungry and cold with hypothermia, as well as covered in mud. But then we finished and we realised what a good experience it was to actually find out what the real situation in Sudan was'.</p> <p>'The case I am going to talk about was in a village visit. We had a case of a patient who gave birth one week before coming to the village, she developed hypotension, then became uncooperative and confused. She refused to take her baby. she sort medical advice twice but with no improvement. When they brought her to the doctor in our medical centre in the village, she was diagnosed as having puerperal psychosis, the doctor prescribed her medication, haloperidol, and she then improved dramatically', 'When I was in registrar training, I faced a similar problem, a patient complained of confusion, we took her baby from her, the doctor on call thought it was a sort of complication caused by post-anaesthesia. I recalled that previous case that I had seen in the village, so we started giving her the same medication, haloperidol, as we had done for the patient that we saw in the village, and this patient improved dramatically'.</p>
Care for patients	<ul style="list-style-type: none"> • Importance of reaching out to patients • Trivial effort may save a life • Importance of health education in curative medicine • Caring for a patient's financial situation • Dealing with families in difficult situations 	<p>Poor pt. have no access to health facilities Trivial help may save a person's life</p> <p>'It was during a village visit, where we saw the kindness of the people and how they were generous, natural and welcoming, yet they have a deficiency in all supplies, basic needs, but still they didn't complain or make us feel that we were foreigners among them. So, I decided from that time to help and provide good services with all respect to our peoples and to travel abroad to see other traditions and customs to learn and compare them to ours'.</p>
Professionalism	<ul style="list-style-type: none"> • Feeling other's pain • Being Responsible for patients • Treating people equally • Showing patience • Listening to people • Respecting patients • Give your maximum no matter the circumstances 	<p>'We went in groups to villages, participating in discovering and trying to solve health problems such as managerial work in the health centres, and give better health education to school students and females Accelerate the project to provide water to the village'. Number [7]</p> <p>'When we were working in the police health centre, we met a lady who believed that she had diabetes. When she passed urine, the ants gathered around her urine. I took detailed notes on her history with careful investigation, I gave her a glucose tolerance test (GTT) and explained to her how to prepare for the test, and I ask her to bring the test to the doctor, the patient insisted that she should be seen by me. She said that "you are the only one who will treat me"'</p>
Personal Development	<ul style="list-style-type: none"> • Improving decision making skills • Trusting in ourselves • Adapting to challenging situations • Communication Skills 	<p>'This incident is linked to an interdisciplinary field research and training and rural residency in semester. I can link this incident to the establishment of a new rural hospital. During that time, I was a doctor working alone at that hospital and I managed to establish it. So, based on what I learned in the rural residency as well as the interdisciplinary field research and training, I started empowering the community and this is what I learned in the village visits and started working with good communication often loomed up the village leader and due t So to recap the icon link the three episodes related to leaderships related to clinical competencies and related to empowering community and related to exploiting low resources and working or mobilizations of resources'.</p>
Belonging to the community	<ul style="list-style-type: none"> • The community appreciates your effort • We were part of the community we were serving • Seeing different rural areas 	<p>'The incident was in a rural visit in 1992, there was a flood in the village, at that time even the university bus could not come to take us, we used tractors to reach the bus area, (the university bus), during these days we managed to support the village population'.</p>

Table 3. Summary of benefits of CBE after graduation.

Themes	Codes	Example of the incidents
Improving patient care	<ul style="list-style-type: none"> • Taking a patient's word seriously • Considering the financial status of patient • Providing detailed information to patients • Treating everyone with honesty and sincerity • Taking care of people, being patient and empathising with patients' suffering 	<p>'In the scenario I'm going to discuss, it was a visit to a village. We had a case of a patient who had given birth a week before arriving in the village, developed hypotension, then became uncooperative and confused, refusing to take her baby. She had sought medical advice twice with no improvement, so they brought her to our village medical centre, where she was diagnosed with puerperal psychosis, and the doctor prescribed medication – haloperidol – and thyroxine. When I was in registrar training, I had a similar problem: a patient complained of confusion, so the doctor on call took the baby from her, and the doctor on call assumed there was some sort of post-anaesthesia complication. At that point, I remembered a case I saw in the village, and we started giving her the same medication – haloperidol – for the patient that we saw in the village, and the patient improved dramatically. That encounter shifted my perspective and caused me to consider new alternatives'. (Participants Z)</p>
Improving health system practice	<ul style="list-style-type: none"> • Problem solving • Managing and designing small projects 	<p>'The incident was when the Minister of Health visited the Hillalia rural area hospital to discuss the challenges and workflow. In the hospital with the civilian leaders, the hospital registration, the Ministry of Health personnel and the doctors in the hospital were attending the meeting to discuss the problem facing the health care system'. says the minister. 'I learnt how to deal with healthcare issues and devise strategies for resolving them. I was involved in similar events after graduation and during my job outside my country, and I was a member of some committees that dealt with the same problem, so it was easy for me to deal with the same situation'. (Participant M)</p>
Developing personal skills	<ul style="list-style-type: none"> • Having confidence. • Keeping an open mind • Considering possibilities • Managing difficult situations 	<p>'During the Interdisciplinary module 1, I had my first true experience and knowledge of community contact. On the first day of our visit, I was astonished to discover that the locals were competing for food and drink with a large group of outsiders. When we complimented our host for his incredibly kind attitude, he said, "You guys are like my sons". I've learned that such altruistic people require the same treatment - to treat everyone I meet with my genuine attitude rather than reflecting their attitude.' I've learned that such altruistic people require the same treatment - to treat everyone I meet with my genuine attitude rather than reflecting their attitude'. (Participant O)</p>
Family Medicine practice	<ul style="list-style-type: none"> • Providing the best health care based on primary healthcare (PHC) • Being attuned to family needs to react to the families, be close to the patients and people from the community 	<p>'During the Rural residency, In Tabat, when we were working with a doctor who went to MOH Madani, I was unable to take the responsibility, I left the hospital and went to a hostel. The doctor came back after that. Later, when the doctor came back from Madani, MOH, he blamed me and shouted at me. This incident has deeply affected me, I will not forget it'.</p>

competency in merely the diagnosis and management of diseases is not enough to satisfy societal needs. Other competencies, including leadership, are critical in solving community health problems, with good communication skills and wider range of qualities, as highlighted previously [12].

Masanobu Okayama et al. (2011) [22] reported that CBE inspires students to practice community health care. In addition, their motivation is increased by health education activities. This is also supported by our study, which showed that graduates from the Faculty of Medicine, University of Gezira in this study also believed that the health of the community is their responsibility, and they must serve the community to which they belong. This is also supported by previous studies, which showed that CBE improves attitudes toward general practice and practicing in rural areas [8,23].

Most of the participants in the current study also reported that CBE has assisted them in improving health system practice. Similarly, a systematic review concluded that increased community engagement and reciprocal information transfer should help medical students prepare for practicing in today's fast-changing healthcare environment, which now incorporates a key new agenda of community accountability [22]. Likewise, as reported by Amalba. et al. (2016), in Ghana [24] a sense of social responsibility develops among the students as they interact with members of the community, which will ultimately prepare the graduates to work and serve the community effectively. Similar trends are seen as well in Uganda [25], Canada, the US and Australia [26].

Previous studies showed that exposing medical students to an environment that 'usually reflects' what they will confront later in their professional

lives allows them to become acclimatised to tough working conditions, preparing them to meet future obstacles and changing their perspective on communal life [26]. The findings of our study support these previous studies as the participants reported that CBE greatly enhanced their personal abilities and had improved their personal skills such as adaptability, working in a challenging environment and self-confidence. According to Kaufman et al. [27], rural training settings are appropriate venues for students to tackle the plethora of social, political, and economic variables that contribute to our society's bad health.

The participants in the current study also reported that after graduation, CBE had improved their levels of professionalism when dealing with patients. This finding is also supported by a previous study conducted in Ghana which examined the qualities students valued in people that they observed as role models during CBE. These qualities included being disciplined, dedicated, honest, approachable, and inspirational [28].

CBE showed a positive impact on graduates based on the current studies and previous studies. However there is still scope for improvement in increasing the benefits of CBE, one recent example of steps to enhance CBE is longitudinal integrated clerkships (LICs) [29], which were pioneered in Australia in the 1990s [30], which was then followed by the Northern Ontario School of Medicine in Canada. Outcomes of LICs have been examined and to date have been largely positive [6,31].

Despite the undoubted benefits of CBE, its implementation still faces some difficulties, such as the negative attitude of some students and hospital-based faculties and lack of resources CBE [3,31].

In this study, however, students found CBE to be extremely beneficial in improving their teamwork and leadership skills, as well as assisting them in being more involved in the community and identifying health and health-related issues, as well as honing their leadership skills [7].

Our study has some clear limitations. Recall bias could be a possible limitation of the study, as participants were requested to think about critical incidents which might have happened some years earlier. Another issue is the small sample size and the fact that participants were chosen from one college of medicine. This could mean that they share similar characteristics, further multi-centre studies are needed using varied study designs.

This first-hand study showed that CBE activities have benefits to students and graduates in different aspects, on both a professional and personal level.

The study needs to be conducted on a larger scale and in different.

Ethical Approval

Ethical Approval has been granted from the research ethics committee for research involving human subjects, faculty of medicine, Gezira university (12-April-2021, ERC-IRB 003).

Conflict of interest

None.

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Other disclosure

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References

- [1] Amini A, Ghaffari R, Hassanzadeh S, Salek F, Golanbar P. The comparison of community-based education programs in faculties of Tabriz university of medical sciences. *Res Dev Med Educ* 2013;2(1):47–9.
- [2] Claramita M, Setiawati EP, Kristina TN, Emilia O, Van Der Vleuten C. Community-based educational design for undergraduate medical education: a grounded theory study. *BMC Med Educ* 2019;19(1):1–10.
- [3] Mash B, De Villiers M. Community-based training in Family Medicine – a different paradigm. *Med Educ* 1999 Oct;33(10):725–9.
- [4] Hamad B. What is community-based education? evolution, definition and rationale. *handbook of community-based education: theory and practices*. Maastricht. Network Publications; 2000.
- [5] Magzoub MEMA, Schmidt HG. A taxonomy of community-based medical education. *Acad Med* 2000;75(7).
- [6] Kelly L, Walters L, Rosenthal D. Community-based medical education: is success a result of meaningful personal learning experiences? *Educ Health* 2014;27(1):47.
- [7] Abdalla S, Elamin E, Ahmed A, Ahmed H, Mohammed H, Sovla MK, et al. Community-based medical education from Gezira medical students' perspective. *J Med Educ* 2019;17(4):215–21.
- [8] Howe A, Ives G. Does community-based experience alter career preference? New evidence from a prospective longitudinal cohort study of undergraduate medical students. *Med Educ* 2001 Apr;35(4):391–7.
- [9] Stephen T, Selvaraj K, Bazroy J, Antony V, Singh Z, Purty AJ. Impact of community based training on medical undergraduates skills upgradation regarding infant and young child feeding practices: a mixed method study. *Indian J Commun Fam Med* 2018;4(1):52.

- [10] Siega-Sur JL, Woolley T, Ross SJ, Reeve C, Neusy AJ. The impact of socially-accountable, community-engaged medical education on graduates in the Central Philippines: implications for the global rural medical workforce. *Med Teach* 2017;39(10):1084–91.
- [11] Ahmed Y, Taha MH, Alneel S, Gaffar AM. Evaluation of the learning environment and the perceived weakness of the curriculum: student perspective. *Int J Res Med Basic Sci* 2018 Dec 26;7(1):165.
- [12] Hamad B. Problem-based education in Gezira, Sudan. *Med Educ* 1985 Sep;19(5):357–63.
- [13] Adefuye A, Benedict M, Bezuidenhout J, Busari JO. Students' perspectives of a community-based medical education programme in a rural district hospital. *J Med Educ Curric Develop* 2019;6:238212051988684.
- [14] Hamad B. Interdisciplinary field training research and rural development programme. *Med Educ* 1982;16(2):105–7.
- [15] Flanagan JC. The critical incident technique. *Psychol Bull* 1954;51(4):327.
- [16] Andersson B-E, Nilsson S-G. Studies in the reliability and validity of the critical incident technique. *J Appl Psychol* 1964;48(6):398.
- [17] Dunn WR, Hamilton DD. The critical incident technique—a brief guide. *Med Teach* 1986;8(3):207–15.
- [18] Waterston T. A critical incident study in child health. *Med Educ* 1988;22(1):27–31.
- [19] Calman KC, Donaldson M. The pre-registration house officer year: a critical incident study. *Med Educ* 1991;25(1):51–9.
- [20] O'Neill PA, Jones A, Willis SC, McArdle PJ. Does a new undergraduate curriculum based on Tomorrow's Doctors prepare house officers better for their first post? A qualitative study of the views of pre-registration house officers using critical incidents. *Med Educ* 2003;37(12):1100–8.
- [21] Branch W, Pels RJ, Lawrence RS, Arky R. Becoming a doctor—critical-incident reports from third-year medical students. *Mass Medical Soc*; 1993.
- [22] Okayama M, Kajii E. Does community-based education increase students' motivation to practice community health care? - a cross sectional study. *BMC Med Educ* 2011;11(1):19.
- [23] Hunt JB, Bonham C, Jones L. Understanding the goals of service learning and community-based medical education: a systematic review. *Acad Med* 2011;86(2):246–51.
- [24] Amalba A, Van Mook WNKA, Mogre V, Scherpbier AJJA. The perceived usefulness of community based education and service (COBES) regarding students' rural workplace choices. *BMC Med Educ* 2016;16(1):1–11.
- [25] Kaye DK, Mwanika A, Sekimpi P, Tugumisirize J, Sewankambo N. Perceptions of newly admitted undergraduate medical students on experiential training on community placements and working in rural areas of Uganda. *BMC Med Educ* 2010;10(1):1–9.
- [26] Tesson G, Curran V, Strasser R, Pong R, Chivot D. Adapting medical education to meet the physician recruitment needs of rural and remote regions in Canada, the US and Australia. *Cah Sociol Demogr Med* 2005;45(2–3):229–53.
- [27] Kaufman AS. Kaufman brief intelligence test: KBIT. AGS. MN: American Guidance Service Circle Pines; 1990.
- [28] Amalba A, Abantanga FA, Scherpbier AJJA, van Mook WNKA. Community-based education: the influence of role modeling on career choice and practice location. *Med Teach* 2017;39(2):174–80.
- [29] Mahoney S, Walters L, Ash J. Urban community based medical education: general practice at the core of a new approach to teaching medical students. *Aust Fam Physician* 2012;41(8).
- [30] Worley P, Silagy C, Prideaux D, Newble D, Jones A. The parallel rural community curriculum: an integrated clinical curriculum based in rural general practice. *Med Educ* 2000; 34(7):558–65.
- [31] Walters L, Greenhill J, Richards J, Ward H, Campbell N, Ash J, et al. Outcomes of longitudinal integrated clinical placements for students, clinicians and society. *Med Educ* 2012;46(11):1028–41.