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Do community-based Medical Schools Produce More Community-based Research? A Review of Four Medical Schools in Sudan and Saudi Arabia

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Abstract

Purpose: Despite several publications comparing the educational outcomes of Community-Based Education (CBE) to non-CBE Medical schools, evidence on utilization of community-based research (CBR) is largely lacking. Therefore, the objective of this research was to compare the utilization and quality of community-based research approaches between four community-based education and non-CBE medical school in Sudan and Saudi Arabia.

Methods: A review of the literature from four schools in Sudan and Saudi Arabia was performed by searching PubMed electronic database using predefined inclusion and exclusion criteria. Classification of studies and appraisal of quality of community engagement was performed.

Results: The review identified a total of 573 articles, 79.4% (455) of which were produced by non-CBE medical schools (Khartoum and Taibah) and 20.6% (118) produced by CBE medical schools (Gezira and Jazan). However, only 9.08% (52) of the articles were CBR while more than a fifth (21.19%) of the school CBE articles were CBR with only almost 6% CBR from the production of non-CBE medical schools. This demonstrates that despite on-CBE schools' significant production of articles relative to CBE schools, nevertheless researchers were more inclined to utilize hospital, laboratory and internal facilities rather than community-based facilities to conduct research activities. The mean scores obtained for quality of community participation among the 52 CBR reviewed studies conducted by CBE and non-CBE medical schools were 1.33 and 0.07, respectively which effectively translates to significantly higher quality of community engagement in research at CBE schools.

Conclusion: Conducting a research in the community instead of the laboratory, hospital or clinical setting does not make it a community-based research. The main challenges facing Community-Based Participatory Research are therefore building and maintaining genuine partnership and trust; sustainability of relationships and commitments; developing the knowledge, capacity and values; sustaining funding, staff, programs, and policy changes. Capacity development for both researchers and communities is required a long with developing policies and funding opportunities within higher education institutions to enhance CBPR as a tool for promotion of equity and social justice.

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1. Introduction

The role of the health professionals is constantly evolving and varies from day to day. As more and more evidence accumulated on the key determinants of health and diseases, more domains become part of health professionals concern. In the past, the community expectation was limited to doctors providing only medical treatment for illnesses, but now the community expects that health professionals also work as advocates for social justice and equity. Medical education should prepare the students to be more socially responsive and accountable, so medical schools as institutions should be representative of that for students and communities.¹

Abraham Flexner in 1912, stated that *“the physician's function is fast becoming social and preventive rather than individual and curative. Upon him society relies to ascertain the conditions that make positively for physical and moral well-being”*.² This notion was further supported in 1988 by the Edinburgh Declaration that *“The aim of medical education is to produce doctors who will promote the health of all people, and that aim is not being realized in many places, despite the enormous progress that has been made during this century in the biomedical sciences.”* The challenging values for medical education are quality, equity, relevance and cost-effectiveness,³ and CBE was one of the preliminary initiatives to address such challenges. WHO defines community-based education as *“a mean of implementing a community-oriented educational program. It consists of learning activities that take place within the community where not only students but also teachers, members of the community and representatives of other sectors are actively engaged throughout the educational experience. CBE can be conducted wherever people live, be it in a rural, suburban or urban areas, and whenever it can be organized”*.²

In the education domain, CBE assumed that through early and extensive contacts with the community, students would become better prepared to deal with those problems in the future. Hamad (2000) discuss the rationale of CBE as: 1) Perceived benefits and returns to partners; 2) Quest for excellence and relevance; 3) Scientifically-based (evidence-based) medical education; and 4) Cost effectiveness.² Magzoub and Schmidt (2000) further surmise that CBE has eleven distinct characteristics namely, it contributes to the solution of the problem of inequality in service delivery. Other characteristics of CBE, the authors describe in terms of CBR and engagement with emphasis that CBE improves the understanding of the role of other sectors

by involving them more in solving health problems. In other words, students in CBE programs have the opportunities to practice a multidisciplinary and holistic approach to health care. Also, CBE facilities contact between the academic institution with community and political leaders and other influential persons in the community, by creating opportunities for robust partnership between the community, university and government.⁴

As highlighted by the Abraham Flexner's recent report, the Global Consensus for Social Accountability of Medical Schools provides a new paradigm shift for medical schools.⁵ The concept of “social accountability” can be defined as *“the obligation [of medical schools] to direct their education, research and service activities towards addressing the priority health concerns of the community, region and/or nation they have the mandate to serve. The priority health concerns are to be identified jointly by governments, health care organizations, health professionals and the public”*.^{6,7} Health systems have one main purpose and that is to respond to people's health needs. Health systems around the globe suffer from two main problems which can be summarized as:

- Unequal access to health care: About 60% of the world populations do not have access to health care and unable to consult a physician when needed.
- Education of health professionals: as it is practiced in most educational institutions for the health professions towards the cure of individuals in tertiary health care, whose problems represent only the tip of the iceberg of the prevailing community health problems.

The new paradigm entails that medical schools must to be held accountable for their products, which are graduates, research and health service delivery to address the health system needs. Medical schools should endeavor to demonstrate participation of these health products in improving quality, equity, relevance, and cost-effectiveness of population health services.⁵ The Global Consensus for Social Accountability of Medical Schools include ten areas, five out of the ten areas (1, 2, 6, 7 and 10) are directly linked to the research function of medical schools.⁷

Both CBR and Participatory Research (PR) approaches are increasingly used to tackle pressing public health issues and addressing environmental and social justice across a variety of settings.^{8–11} The Centre For CBR in Ontario, Canada have developed a working definition for CBR program. The definition is based on

three qualities of CBR of community positioned; collaborative orientation; and action orientation.⁸ Community-Based Participatory Research (CBPR) approach provides specific and objective measurements to assess these three qualities. CBPR helps in enabling people to gain control over determinants of their health and have the potential for bridging gaps between research and practice.^{11,12} CBPR serves as an alternative research paradigm, integrating the realm of education and social action in order to facilitate less health disparities as well as enhance the overall health of populations. CBPR is in effect an orientation to research and should not be confused as a research methodology. This approach focuses on the relationships between academic and non-academic partners including community and other governmental and non-governmental agencies. It provides a hub for community theories, participation together with emphasis on practices into the research efforts integrating long-term commitment mutual benefit and co-learning principles.¹³ The highlight of CBPR is involvement of the community in every phase of the project including designing research questions and methodology.

2. Rationale and objectives

According to a validation survey of a Community Based Education (CBE) program initiated in 43 medical schools, the participants felt that the key competencies of the program should aim to teach graduates the skills and capabilities to identify and conduct research that will contribute to resolution of priority health issues in a community.¹⁴ As stated in the Global Consensus for Social Accountability of Medical Schools, the main objective of every medical school should be to provide empirical evidence on how their educational, research and service related products are involved in enhancement of quality, equity, relevance, and cost-effectiveness of population health services.⁷ The CBE philosophy has been one of the global initiatives to address social determinants of health challenges. Although extensive research on CBE programs designed to examine quality of graduates and impact of school services exists, there has been less emphasis on assessing the ways in which CBE (re)shapes and potentially improves the scientific research of the school itself. Therefore, our main question focuses on the research activities within the school rather than the graduates themselves or the education curriculum.

Despite accumulative research providing comparative analysis of the educational outcomes between CBE and non-CBE schools however, there are little

published research comparing the community-based research (CBR) outcomes of CBE with non-CBE schools. The curriculum philosophy should guide the medical school education, services and research activities. There is a general assumption (hypothesis) of medical schools that implement Community-Based Medical Education philosophy to be more likely to implement CBR approaches.

The objective of this research was to compare the utilization and quality of community-based research approaches between four community-based education and non-CBE medical school in Sudan and Saudi Arabia. The specific objectives were to: 1) identify all research articles published by faculties of medicine in universities of Gezira and Khartoum (2000–2016) in Sudan, Jazan and Taibah (2005–2016) in Saudi Arabia; 2) determine the proportion of CBR; and 3) assess the quality of community participation *in* community-based research.

3. Methodology

3.1. Study design

A review of the literature from four schools in Sudan and Saudi Arabia was performed by searching PubMed electronic database using predefined inclusion and exclusion criteria. Classification of studies and appraisal of quality of community engagement was performed.

3.2. Study setting

The research covers four medical schools in Sudan and Saudi Arabia. CBE schools represented by Gezira and Jazan Universities, and non-CBE schools represented by Khartoum and Taibah Universities in Sudan and Saudi Arabia, respectively. As described in the curriculum document of each school, Gezira and Jazan medical schools are using Community-Based Education programs, while Khartoum and Taibah schools represent non-CBE as they are using subject based curriculum and mainly train students at University tertiary hospitals. Faculty of medicine, Khartoum University was founded as Gordon Memorial College in 1902 and established in 1956 when Sudan gained independence as first medical school in Sudan. Faculty of medicine, University of Gezira was established in 1975 as the third medical school in Sudan after Khartoum and Juba Universities. Faculty of medicine in Jazan was established in 2002 as part of King Abdul Aziz University in Jeddah before it became part of

Jazan University in 2005. Faculty of medicine in Taibah University was established as the beginning of «Faculty of Medicine and Medical Sciences» as a branch of King Abdul Aziz University in 1998, and after the decision of the Council for Higher Education to establish Taibah University in 2003 it became "School of Medicine".

The first author worked in both University of Gezira and University of Jazan, based on this experience in teaching and research this study question was formulated. Then Khartoum and Taibah universities were selected as comparative institutions to Gezira and Jazan were selected respectively.

3.3. Search strategy

To identify articles published by researchers affiliated with schools of medicine in the University of Gezira, University of Khartoum, University of Jazan, and University of Taibah, data sources, key words, and search strategies were defined. The PubMed/PubMed Central Database of The National Center for Biotechnology Information (NCBI) (<http://www.ncbi.nlm.nih.gov/>) were searched using a combination of the key phrases; "Faculty of Medicine", "College of Medicine", "University of Gezira", "Gezira University", "University of Khartoum", "Khartoum University", "University of Jazan", "Jazan University", "University of Taibah" and Taibah University. The PUBMED search criteria included articles published in the English language with the specified affiliation and publication date. Because this was an exploratory study the research used only one database (PUBMED), grey records or other databases were included.

The search strategy for PUBMED is presented in Table 1. The three inclusion criteria were the following; articles only in English; publication date (01/01/2000 to 01/01/2017 for Sudan) and 01/01/2005 and 01/01/2017 for Saudi Arabia; and at least one of the authors should be affiliated with the school under study. Articles that do not satisfy any one of these criteria were excluded. For Sudan Universities [University of Khartoum and University of Gezira] the search includes the articles published in the period from 01/01/2000 to 01/01/2017. While for Saudi Arabia (Jazan University and University of Taibah) the search includes articles published between 01/01/2005 and 01/01/2017 as both universities were established in 2005.

The review process involves screening, classification, quantitative analysis, and qualitative assessment of the quality of community participation and engagement. Screening of articles was completed according to

the inclusion and exclusion criteria. This was followed by extraction of article data related to the title, author, affiliation, year, journal, DOI, objectives, study design and research setting. Based on the setting, the papers were divided into four groups: community-based, hospital-based, laboratory-based and facility-based. The study design determined the classification of the research into interventional or observational research.

In the qualitative part of this review, the findings of the quality of CBPR of the community-based research articles have been reported. The researchers were not blinded to the names of authors and journals. The type of problems or outcomes has not been considered as inclusion or exclusion criterion and any study relevant to community health has had the chance for entering the study. The CBR publications were evaluated for evidence of community participation in different research processes and each paper was given a score. Qualitative analysis was done by content analysis to assess the quality of community participation in community-based research. CBPR criteria for appraisal of quality of community engagement that was used by Salimiet *al.* and Viswanathan *et al.* in other systematic reviews^{15,16} was employed in this research. The appraisal criteria contain 10 elements related to community participation in the research process, namely; choosing a research question; proposal development; financial responsibility for grant funds; study design; building partnership; preparation of measurement instruments and data collection; development and implementation interventions; interpretation, and dissemination of result; and applying the findings. Subsequently, the study community participation score is calculated out of ten. Only studies that scored 5 and above were considered as CBPR. The first author conducted the evaluation and revised by the second and third authors. Data analysis conducted by the third author.

3.4. Statistical analysis

Mean (standard deviations, SD) were reported for continuous variables. Frequencies with percentages were reported for categorical variables. A Chi-square test was used for comparing proportions. Differences with P -values ≤ 0.05 were considered to be statistically significant. Statistical data analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 23 (IBM Corp, New York, USA).

4. Results

The process of selection and categorizing of enrolled studies is summarized in Fig. 1. As shown, about 764

Table 1
Search strategy for PUBMED and key words.

Key words	Search terms
University of Gezira:	
Faculty of Medicine AND University of Gezira	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (Faculty of Medicine[Affiliation] AND University of Gezira[Affiliation])
Faculty of Medicine AND Gezira University	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (Faculty of Medicine[Affiliation] AND Gezira University[Affiliation])
College of Medicine AND University of Gezira	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (College of Medicine[Affiliation] AND University of Gezira[Affiliation])
College of Medicine AND Gezira University	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (College of Medicine[Affiliation] AND Gezira University[Affiliation])
University of Khartoum:	
Faculty of Medicine AND University of Khartoum	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (Faculty of Medicine[Affiliation] AND University of Khartoum[Affiliation])
Faculty of Medicine AND Khartoum University	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (Faculty of Medicine[Affiliation] AND Khartoum University[Affiliation])
College of Medicine AND University of Khartoum	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (College of Medicine[Affiliation] AND University of Khartoum[Affiliation])
College of Medicine AND Khartoum University	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (College of Medicine[Affiliation] AND Khartoum University[Affiliation])
Jazan University:	
Faculty of Medicine AND University of Jazan	(("2005/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (Faculty of Medicine[Affiliation] AND University of Jazan[Affiliation])
Faculty of Medicine AND Jazan University	(("2005/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (Faculty of Medicine[Affiliation] AND Jazan University[Affiliation])
College of Medicine AND University of Jazan	(("2005/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (College of Medicine[Affiliation] AND University of Jazan [Affiliation])
College of Medicine AND Jazan University	(("2005/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (College of Medicine[Affiliation] AND Jazan University[Affiliation])
University of Taibah:	
Faculty of Medicine AND University of Taibah	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (Faculty of Medicine[Affiliation] AND University of Taibah [Affiliation])
Faculty of Medicine AND Taibah University	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (Faculty of Medicine[Affiliation] AND Taibah University[Affiliation])
College of Medicine AND University of Taibah	(("2000/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (College of Medicine[Affiliation] AND University of Taibah[Affiliation])
College of Medicine AND Taibah University	(("2005/01/01"[Date - Publication]: "2017/01/01"[Date - Publication])) AND (College of Medicine[Affiliation] AND Taibah University[Affiliation])

papers were in the primary list of the abstract review with a total of 573 articles included in the quantitative analysis. For the final qualitative analysis 52 studies were found eligible and included.

The classification of the 52 CBR studies shows that only 5 (9.62%) articles represented interventional studies and 47 (90.38%) observational studies. Four studies of the 5 interventional studies were quasi-experimental^{17–20} and one was a randomized community trial.²¹ All interventional studies were conducted by CBE schools. There were two cohort studies^{22,23} and two Case-control studies^{24,25} each represented 3.85% of the total. Cross-sectional studies^{23,26–67} were 43 and the dominant type of studies in CBR which represented

82.69% overall. Out of the 25 studies reported from CBE schools, 20 (80.00%) were cross-sectional studies while only five (20.00%) were interventional studies (quasi-experimental and randomized community trial). All five interventional studies were reported by University of Gezira – Sudan. For non-CBE schools, none of them reported CBR interventional studies. From the 27 community-based studies, there were 23 studies (85.19%) cross-sectional, 2 (7.41%) cohorts and 2 (7.41%) case-control studies.

The comparison of research settings of publications between CBE and non-CBE schools in Sudan and Saudi Arabia are represented in Table 2. CBE schools conducted nearly more than four folds CBR than

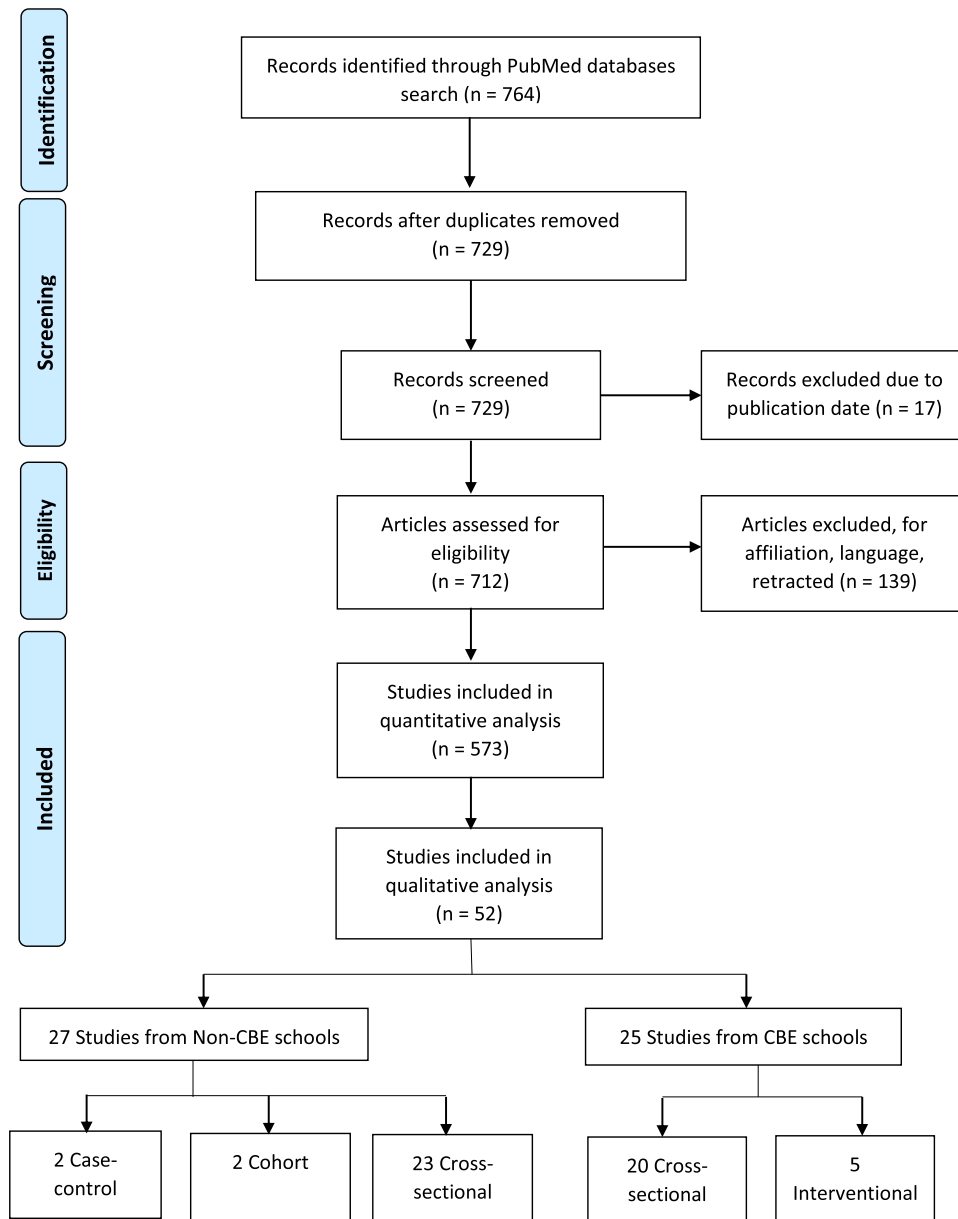


Fig. 1. PRISMA Flow Chart: the process of selection and categorizing of enrolled studies.

non-CBE schools. CBR account for 21.19% of research product of CBE schools compared with only 5.93% of non-CBE schools and this difference was statistically significant ($p < 0.0001$). This trend was consistent in Sudan and Saudi Arabia.

The evidence for community involvement in research [frequency, (%)] according to schools and study type ($n = 52$) is summarized in Table 3. Studies that include at least 5 elements were considered as CBPR. The only study that scored 6 elements and satisfied the criteria of

CBPR was a quasi-experimental study from University of Gezira.¹⁷ This represents 0.84% of the 118 research articles published by CBE schools. Only schools from Sudan (Gezira and Khartoum) reported evidence of community participation in some of the CBR elements.

Among the 12 studies conducted in the community reported by University of Gezira, the most common reported CBPR elements were recruit and retain of subjects as well as developing, implementing intervention which were reported in 5 studies, followed by

Table 2
Classification of articles by research type and setting, *n* (%), (*n* = 573).

University	Community-Based	Facility-Based	Hospital-Based	Laboratory-Based	<i>P</i> value
Sudan					
Gezira (CBE)	12 (20.69)	5 (8.62)	35 (60.34)	6 (10.34)	0.001
Khartoum (NON-CBE)	15 (4.95)	49 (16.17)	187 (61.72)	52 (17.16)	
Saudi Arabia					
Jazan (CBE)	13 (21.67)	14 (23.33)	15 (25)	18 (30)	0.007
Taibah (NON-CBE)	12 (7.89)	35 (23.03)	70 (46.05)	35 (23.03)	
Total CBE	25 (21.19)	19 (16.10)	50 (42.37)	24 (20.34)	0.0001
Total NON-CBE	27 (5.93)	84 (18.46)	257 (56.48)	87 (19.12)	
Overall	52 (9.08)	103 (17.98)	307 (53.58)	111 (19.37)	

Table 3
Evidence of community involvement in research according to schools and study type, *n* (%), (*n* = 52).

Item	CBE				NON-CBE			
	Gezira		Jazan		Khartoum		Taibah	
	Interventional	Observational	Interventional	Observational	Interventional	Observational	Interventional	Observational
Select Research Question	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Develop Proposal	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Have Financial Responsibility	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Design Study	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Recruit and Retain Subjects	4 (80.0)	1 (14.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Participate in Measurement Instruments and Data Collection	3 (60.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (6.7)	0 (0.0)	0 (0.0)
Interpret Findings	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Disseminate Findings	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Apply Findings	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

participation in measurement instruments and data collection in 3 studies. The interpretation of findings, dissemination of findings and application of findings were reported in one study.

Table 4 shows the descriptive statistics of the community participation score in the research program according to the school and curriculum type. Community participation score evaluates the quality of community participation in the study. The score is the total number of community participation elements (Out of 10) used in each study. Mean scores gained for qualities of community participation for CBE and non-CBE schools in this review were 0.64 and 0.04, $p < 0.0001$, respectively.

Fig. 2 illustrates the percentages of community participation in different parts of research processes for 25 studies from CBE schools. Community participation in different parts of a research process showed that retain subjects and develop, implement intervention with 20% had the greatest percentage, followed by 12% for participation in measurement instruments and data collection. The findings interpretation, dissemination and application elements were reported in 4% of studies. None of the studies (0%) provide the community with a voice to participate in the research question selection, proposal development, financial responsibility, or study design.

Table 4

Community participation score in research according to schools and curriculum type ($n = 52$).

Variable	N	Mean	S.E. Mean	SD	Variance	Range	Minimum	Maximum
CBE								
Gezira	12	1.33	0.54	1.87	3.52	6.00	0.00	6.00
Jazan	13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	25	0.64*	0.29	1.44	2.07	6.00	0.00	6.00
NON-CBE								
Khartoum	15	0.07	0.07	0.26	0.07	1.00	0.00	1.00
Taibah	12	0.00	0.00	0.00	0.00	.00	0.00	0.00
Total	27	0.04*	0.04	0.19	0.04	1.00	0.00	1.00

P value ≤ 0.05 , SD=Standard Deviation, S.E=Standard Error.

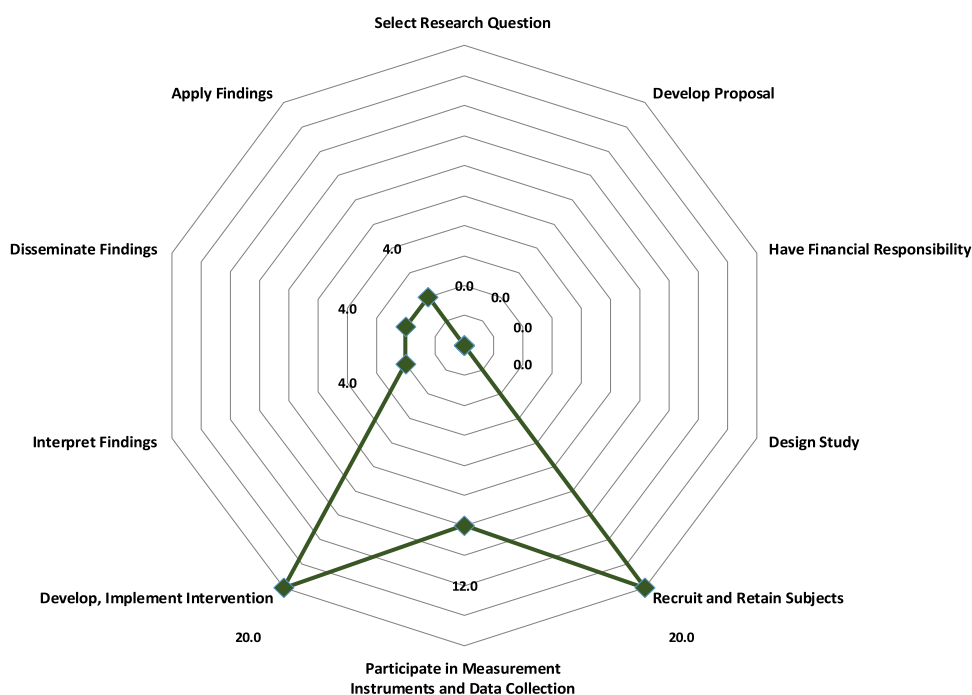


Fig. 2. Community participation percentage in different parts of research processes for 25 community based studies in CBE schools (Gezira and Jazan).

The community participation in different parts of research processes for 27 studies from non-CBE schools percentages are illustrated in Fig. 3. Only one study (3.7%) from Khartoum University reported one element of community participation in cross-sectional study which was participation in measurement instruments and data collection.

5. Discussion

The Global Consensus for Social Accountability of Medical Schools requests that medical schools present and document evidence on the quality of their products in education, research and services they provide.^{1–3,14}

Utilization of CBR could serve as a proxy indicator for social accountability in research domain. For decades, community-based participatory research was used as an imperative strategy that joins health and social justice advocates with research institutions to collaborate in addressing health problems.^{9,12,68,69} The increasing attention to participatory research approaches in public health during the past decade has been as a result of their capability to improve health and eliminate health disparities. This has been achieved by tackling social justice, bridging gaps between research and practice, and establishing conditions that supports control of individuals over their health determinants.^{9,69} Medical schools should therefore participate in improving

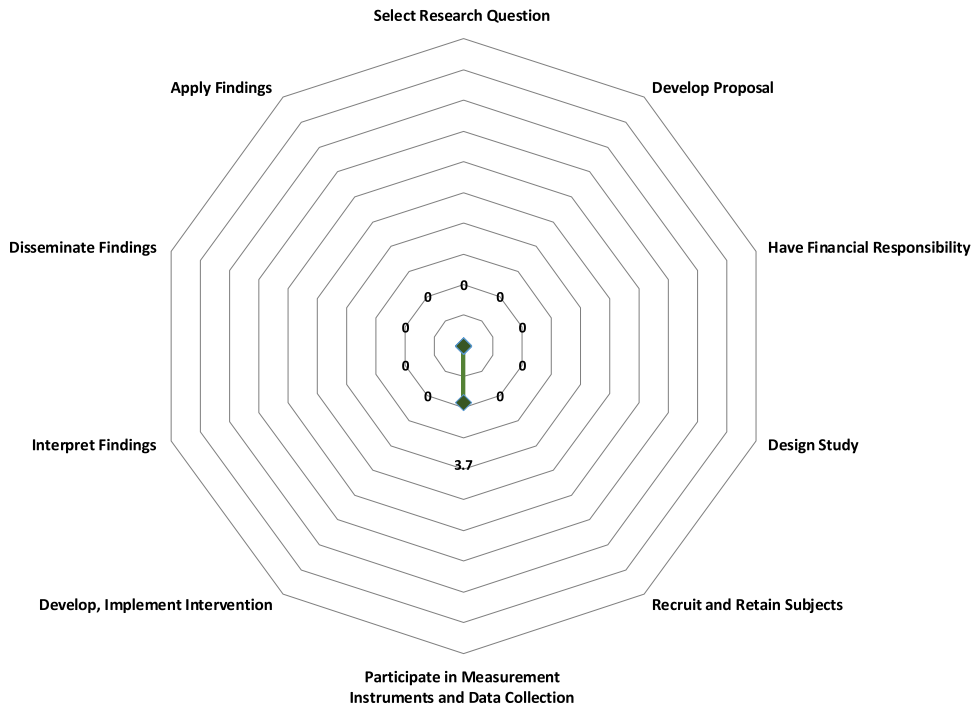


Fig. 3. Community participation percentage in different parts of research processes for 27 community based studies in Traditional schools (Khartoum and Taibah).

quality, equity, relevance, and cost-effectiveness of population health services³ through CBR.

CBPR approaches have the potentials for bridging the gaps between research and practice and facilitate gaining of control of individuals over determinants of their health. CBPR integrates education and social action to reduce health disparities and thus improve population health. Both CBE and CBPR have a shared philosophy, principles, concepts, goals and vision. CBR could be used as an objective measurement for the social accountability in research domain of medical schools. Still, there is a need for developing tools and procedures to evaluate the impact of CBE schools research in improving population health as a central goal for medical education.

Although non-CBE schools were generating significantly more articles than CBE schools, however the researchers were apt to use hospitals, laboratories and internal facilities more often than community as settings for their research activities. This review demonstrates that CBE schools exhibit significantly more CBR than non-CBE schools, which reflect the that the curriculum philosophy may have a considerable impact on the staff research activities. Although, CBE medical schools use the community as a research setting considerably more than non-CBE schools but improvement of the quality of

community engagement in CBR is critical in addressing the quality, equity, relevance, and cost-effectiveness of education and population health services. Community based research requires the full participation of the community in all phases of the research process.

Only one study satisfied the criteria of CBPR¹⁷ which reflect limited participation of community. It reflects that researchers need to develop skills about how to conduct research liaising with the community instead of conducting research on a community or in a community. Community based research should satisfy the three qualities of being community positioned; collaborative; and action-oriented.⁸ The CBR should focus on population issues rather than on individuals and the impacts and outcomes at the community level instead of at the individual level.^{15,16} It seems that the school philosophy, expertise to work with communities, existing relationships (partnership) with communities^{11,70} and institutional policies, resources that are made available to do CBR could be determinant factors for CBR.^{10,71}

6. Conclusion

Conducting a research in the community instead of the laboratory, hospital or clinical setting does not make it a community-based research. The main challenges

facing Community-Based Participatory Research are therefore building and maintaining genuine partnership and trust; sustainability of relationships and commitments; developing the knowledge, capacity and values; sustaining funding, staff, programs, and policy changes. Capacity development for both researchers and communities is required along with creating organizational policies and funding opportunities within higher education institutions to enhance CBPR as a tool for promotion of equity and social justice.

Limitations

The study used only one database, more studies utilizing different databases and gray records is needed. The study focus is on the descriptive in nature, more analytic studies are required to identify the factors and associated with utilization of CBPR.

Source(s) of support

None.

Conflicts of interest

There are no conflicts of interest to declare.

Criteria for inclusion in the authors'/contributors' list

AMG and MEM conceptualized the study and developed the methodology, AMG collected the data, IM performed the analysis, and AMG wrote the manuscript, AMG, IM and MEM approved the final manuscript.

The manuscript has been read and approved by all the authors.

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