“...we were like tourists in the theatre, the interns assisted almost all procedures...” Task sharing and the training of Assistant Medical Officers in Tanzania.

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Abstract

Background: Tanzania is among the countries that adopted task sharing as a strategy of addressing health workforce shortage. Although the strategy has existed for over five decades, concerns are upon the quality of the training of the mid-level cadres amidst the growing number of medical universities. This study sought to explore the challenges facing the training of the Assistant Medical Offices, AMOs (a mid-level cadre) in Tanzania.

Methods: An exploratory qualitative case study was carried out in four regions to include one rural district in each of the selected regions and two AMOs Training Colleges in Tanzania. A semi-structured interview guide was used to interview 29 Key informants from the district hospitals, district management, regional management, AMOs training college and one retired AMO. In addition, four focus group discussions were conducted with 35 AMO trainees.

Results: Training of AMOs in Tanzania faces many challenges. The challenges include; use of outdated and static curriculum, inadequate tutors (lack of teaching skills and experience of teaching adults), inadequate teaching infrastructure in existence of many other trainees to include interns, and limited or lack of scholarships and sponsorship for the AMO trainees.

Conclusions: The challenges facing AMO training not only affect the quality of the graduates but also affect the realization of task sharing strategy that requires that task sharing should not compromise the quality of services produced by the task-shared cadre. It is high time for revising the AMOs curricula and train the tutor through continued medical education programmes to reflect the dynamics of medical education. The government in collaboration with other stakeholders should work together to address the challenges on teaching infrastructure and scholarships to this cadre that has continued to be the backbone of the primary health care in Tanzania. Keywords; Assistant medical Officers, Task sharing, Task shifting, Medical education, Tanzania, Primary health care

Introduction

One of the strategies adopted by many countries globally to lessen the burden of health workforce shortages in the provision of health care services is task-sharing [1-3]. Tasking sharing is the name given to the process whereby less specialized health workers take on some of the responsibilities of
more specialized workers in a cost-effective manner without sacrificing the quality of care [4]. Many
countries in Africa and other parts of the world have associate clinicians that receive different levels
of training and carry out different tasks at varying levels and thus labelled differently [1-3]. However,
despite the vital role played by task-sharing in addressing the health workforce crisis, this strategy
still suffers many challenges. In some countries, the challenges include: maintaining quality and
safety; addressing professional and institutional resistance; sustaining motivation and performance of
health workers [5, 6].

In Tanzania task sharing strategy dates back to the 1930s when the country started to create country-
specific cadres to provide services mostly in rural areas. These cadres included the Clinical Assistants,
the Rural Medical Aides, Clinical Officers and many other [7, 8]. In the early 1960s, with the growing
population, the critical shortage of medical doctors, urbanization of medical doctors and the long-time
training required for the medical doctors; the country embarked to train a middle-level cadre of
clinical practitioners that will perform those roles that were primarily meant for medical doctors at the
district level; these were the Assistant Medical Officers, AMOs [8].
The AMO is an upgraded Clinical Officer who after working for a minimum of three years undergoes a
formal two years residency training in internal medicine, paediatrics, surgery, obstetrics and
gynaecology and community medicine [8]. The training of the AMOs is under the ministry responsible
for health and it takes place at an AMO training school located in the selected referral or regional
referral hospitals. By 2014, Tanzania had seven AMO schools located in four different zones of
Tanzania. Four of these AMO schools are under the private-public partnership between Faith-Based
Organizations (FBOs) and the government. After the two years of residency training, the AMO trainees
are awarded an Advanced Diploma in Clinical Medicine. Based on the World Health Organization
classification of associate clinicians, AMOs qualify to be senior Associate Clinicians [9]. Therefore,
after training AMOs are expected to provide clinical care, including emergency obstetric and surgical
care at the district level and below.

A study carried in Mwanza and Kigoma regions in Tanzania revealed that over 85% of Caesarean
sections and most of the other obstetric surgeries were performed by AMOs [10]. The situation of the
two regions, Mwanza in the lake zone and Kigoma in the western zone are typical of many regions in Tanzania. Furthermore, by 2012, the country's health workforce profile revealed that the AMO served a proportionately bigger population than the MD. The AMOs population ratio stood at a national average of 1:13,000, with regional variation from 1:13,000 in Dar es Salaam to 1:120,000 in Kagera while that for MD was at 1:25,000 with regional variations as well [11]. The latter happens in a country that has less than 50% of the total required health workforce, less than 40% of the required medical doctors with only 25% of the doctors serving the rural population [12]. In overall, above 70% of the population in Tanzania reside in rural areas [13].

Despite the known contribution of the AMOs in addressing the health workforce crisis, anecdotal information reveals that their training succumbs many challenges that if not addressed will inevitably have adverse effects on their roles as a cadre in task sharing strategy. Some of the stated challenges are the shortage of tutors, limited sponsorships and limited career path for the Amos graduates. This study, therefore, aimed to explore the challenges facing AMOs training in Tanzania.

**Methods**

An exploratory case study design that adopted a qualitative approach was used for identifying challenges facing the training of AMOs in Tanzania. A qualitative case study was necessary for undertaking this study as the training of AMOs is a real phenomenon that involves social processes [14,15].

**Context of the study**

Tanzania is divided into seven geopolitical zones, namely: Northern, Eastern, Central, Western, Lake, Southern highlands and Southern zones. The south, west and central zones are considered more rural compared to the rest zones. Tanzania has five cities, two located in the northern zone, and the rest located in eastern, lake and southern highland zones. Dar es Salaam, the largest business city that contains the largest number of the health workforce in the country is located in the eastern zone.

This study was carried out in four rural districts (Handeni, Kasulu, Kilombero, and Masasi) located in the four zones (Northern, Western, Eastern and Southern in that order), two AMO schools (one in the northern zone and one in the eastern zone) and at the national level with officials from the ministry of
health responsible for the health workforce development and training (table 1). The selected AMO schools involved one that was owned and managed by the ministry of health and one under the public-private partnership.

**Table 1. Assistant Medical Officers training schools in Tanzania**

| Name                  | Ownership | Location | Zone     | Region              | District       |
|-----------------------|-----------|----------|----------|---------------------|----------------|
| Bugando               | FBO       | Lake     | East     | Mwanza              | Nyamagana      |
| Ifakara-TTCIH         | FBO       | North    | East     | Morogoro            | Ifakara        |
| KCMC                  | Military  | East     | Kilimanjaro | Dar es Salaam     | Moshi urban   |
| Lugalo                | Ministry  | Southern | Mbeya    | Ifakara             | Kinondoni      |
| Mbeya                 | FBO       | North    | Arusha   | Mbeya urban         | Mbeya urban    |
| Selian                | Ministry  | North    | Tanga    | Arusha urban        | Arusha urban   |
| Tanga                 | Ministry  | North    | Tanga    | Tanga urban         | Tanga urban    |

The four zones were purposefully selected to include rural zones, a zone with an AMO school under public-private partnership and a zone with AMO school that is under the ministry of health. The choice of zones with AMO schools also considered the presence of one AMO school in town and one in a rural area. In each zone, a random selection of rural districts was done whereby one rural district was included in the study.

**Study population**

This study involved participants from different levels of the health care system that are involved in training, supervision of AMOs after training and those working with the AMOs. These included participants from; Principals from AMOs training schools, AMOs tutors, AMO trainees, Regional Medical Officers, District Medical Officers, Medical Officers in charge of the district hospitals, Senior AMOs at the district hospitals and one retired AMO [table 2].

**Table 2: Study participants (Key Informants and Focused Group Discussants)**

| Participants                      | Number | Participants               | Number |
|-----------------------------------|--------|---------------------------|--------|
| Regional Medical Officers         | 04     | Principal, AMO schools    | 02     |
| District Medical Officers         | 04     | AMO tutors                | 05     |
| Medical Officers in-charge        | 04     | Assistant Medical Officers| 09     |
| AMO students (4-FGDs)             | 35     | Retired AMO               | 01     |

**Sampling strategy**

The purposeful sampling strategy was used to enrol key informants for this study. The key informants were Ministry of health officials dealing with the training of AMOs, Regional Medical Officers, District
Medical Officers, District Medical Officers, Medical Officers in charge of the district hospitals, Senior AMOs at the district hospitals and one retired AMO.

For the focused group discussion, a convenience sampling strategy was used to obtain AMO trainees. Participants who were present during the data collection period and agreed to participate in the study were enrolled from the two AMO schools. In each AMO school, two focused group discussions were conducted one with male and one with female AMO trainees.

**Data collection**

Data collection involved Key- Informant Interviews (KII) and Focused Group Discussions (FGD).

*Key Informant interviews*

We used a semi-structured interview guide to carry out 29 KII and four FGDs (table 2). The interview guide was prepared based on experiences on the training of AMOs and task sharing in the country as documented from the available literature [8,16,17]. The questions in the guide solicited information on the challenges at the AMO schools, at the districts and at the national level.

The interviews were carried out at a designated office of the informant and it was recorded using a digital audio recorder. A research assistant accompanied the researcher took field notes during the interview. Each interview lasted between 60 and 100 minutes.

*Focused Group Discussions*

We used a semi-structured FGD guide developed based on the competencies detailed in the AMOs' training curriculum and available literature on task sharing [7,8] to carry out four FGDs with AMO trainees from the two AMO schools involved in this study. In each school, we carried two FGDs, one with the female and the other with the male AMO trainees. The number of participants in each FGD ranged from 7-12. In total 35 AMO trainees participated in the four FGDs. From the FGDs, we explored challenges related to the training of the AMOs in relation to gaining knowledge and skills as stated in their curriculum. The FGDs lasted between 55 and 120 minutes. A researcher moderated all FGDs.
research assistant assisted with note taking and recording of discussions using digital audio recorded with the permission of participants.

**Data management**

In order to ensure quality, experienced research assistants were recruited and trained on the objectives of the study and the full research process. During data collection, the researchers carried out most of the interviews and the research assistants were taking field notes. Audio records of the interviews were transferred into a computer by the Data Manager and kept in a PIN folder in a computer that is only accessible to him. The transcripts were all kept by the Data Manager but only shared with the research team for analysis.

**Data analysis**

All interviews and FGDs transcripts were transcribed verbatim. The Swahili transcripts were then translated into English before the analysis. The research team cross-checked the accuracy and completeness of translations against the original notes before coding. Any gaps identified or clarifications needed were discussed and corrections made accordingly.

In the beginning, the research team read and re-read the transcripts to familiarize with the data before the coding process. The team met together where each one coded at least two transcripts and met together to discuss the codes and coding process for harmonization or clarification and finally agreed on the final codes. Two separate researchers coded at least one similar transcript. After agreeing on the codes and coding process the team distributed the transcripts among each other for the coding process. All the coded transcripts were then organized by using NVIVO 10 qualitative analysis software.

Qualitative content analysis was used to guide the analysis. Codes were extracted from the reduced meaningful unit. Similar codes were grouped together and through abstraction, sub-categories were formed. Through comparison and checking and rechecking of similarities and differences between the sub-categories, the sub-categories were sorted to form categories to reflect the manifest content of
the text that were supported with suitable quotes from the transcripts. Further interpretation of the categories was then used to ensure the latent meaning is also brought into focus. The whole process although described as a linear process, it was iterative at all points to ensure that both the manifest and latent meaning of the data is not lost.

**Ethical considerations**

Ethical approval was obtained from the Muhimbili University of Health and Allied Sciences Research and Ethical Review Committee. Permission to conduct the study in the four study settings was granted by the Ministry of Health. Written informed consent was obtained from each participant after receiving explanations about the study aim and they were informed that their participation was voluntary and they were free to decline or withdraw at any time in the course of the study. Participants’ privacy was assured by not using their names during the data collection process and even identity of the health facility was covered to ensure that no one out of the research team could identify the place where data was collected. Permission was requested on the use of audio recorder during interviews and discussions.

**Results**

From the interviews and FGDs, we found that the training of AMOs was challenged by; non-responsive static curriculum, limited sponsorships, human resources inadequacy and limited teaching infrastructure (figure 1).

*Figure 1: Challenges facing AMOs' training in Tanzania*

**The use of non-responsive static curriculum for AMOs training**

The use of static non-responsive curriculum attributed to lack of regular revision and low emphasis on basic science courses in the curriculum was among major challenges facing AMOs training in Tanzania.

From the AMOs tutors, we found that the curriculum that is key to the training of AMOs was written in 2000 (over 15 years ago), this was the first written curriculum since 1963 and it has never been...
reviewed since 2000. The informants added that the failure to review the curriculum is attributed to the dilemma that surrounds the overall structure of the course. Noteworthy, the AMO program is the only course in which graduates are offered advanced diploma at the end of the course in Tanzania. In the contemporary academic system of Tanzania, Advanced diploma courses have been phased out.

“...it has never been reviewed...I know some years back they called us to a review meeting but then came to a conflict with the ministry of education that advanced diploma programmes are no longer in the national academic framework. Since then I have heard nothing about the review of this curriculum...” (KI-AMO training college).

Informants from the district hospitals stated that despite the changes in both the training and practice in medicine, the AMO training has remained static. They added that the AMO curriculum is having serious knowledge gaps in basic sciences that form the foundation of medical practice. The basic sciences are limited to a period of only eight weeks and they are not the only subjects in that period rather they are taught concurrently with clinical rotations.

“...in clinical officers training, the training on anatomy and physiology is too basic...it was expected that when one joins AMOs training, then the training on physiology, anatomy, biochemistry and other basic sciences be upgraded....surprisingly, eight weeks everything is lumped together with other clinical subjects....then understanding of basic sciences to AMOs is negligible... “ (KI- Kigoma).

In Tanzania’s health system, there is no formal internship programme after completion of AMO studies. Analysis of the interviews shows that; each council has its own coping mechanism to create an opportunity for “working under the supervision of AMO graduates” before starting working independently. Depending on the council that AMO is working, the time for working under supervision varies from three to twelve months. It is imperative to note that this process is not structured and thus there is no clear-cut goal on what an AMO should gain from this process.

“... When they return from their training, we have senior AMOs and MDs here, so we attach these fresh AMOs to these senior in different departments...When the senior feels that now this AMO can work independently then s/he moves to another department...the duration varies from three months
Limited sponsorship for AMOs training

Across health facilities and colleges, AMO trainees and junior AMO reported having attempted self-sponsorship as a response to the failure of the government to provide sponsorship to them. They added that, as government employees, AMO trainees used to receive sponsorship from the government once they were admitted. However, they reported that the scholarships were decreasing gradually and nowadays it has remained at the discretion of each council. They added that most of the councils have failed to provide the scholarships. Majority of the AMO trainees were now attempting self-sponsorship that affects themselves and their families.

“...Some council supports their students and some do not... At your home, you have left children who need school fees... So, it is very difficult to concentrate on a situation when you have no money... sometimes you feel like you have given your family a burden by your decision of coming to school...” (FGD-AMO training college).

Inadequacy in human resources

The challenges of human resources manifested as an absolute shortage of tutors and relative shortage in terms of experienced tutors and lack of pedagogical teaching methods.

Informants from the AMO schools stated that despite the desire of producing high-quality workforce, AMO schools as well as the hospitals where AMO are trained face a deficiency of teaching staff. The shortage of teaching staff affects the AMOs training to acquire essential skills especially in the clinical rotation where the shortage is worse.

“...the serious shortage is in clinical rotations, as we do not have a single specialist in this AMO School. ..... For instance, in obstetrics and gynaecology we have only one registrar and mostly we rely on the only one available gynaecologist at the hospital who sometimes has travelled for other hospital duties ...” (KI- AMO Training College)

Furthermore, informants from the AMOs training schools stated that most of the tutors were
employed to the AMO training schools immediately post their internship without any experience. Given the fact that AMO training is a continuing education that requires proper methods as most of the students are adults, the informants felt that the use of fresh graduates was creating an unfavourable learning environment to the AMO trainees who have seen the real workplaces compared to the fresh graduate medical doctors. Ascribed to the feelings of the AMOs, the tutors expressed that they also felt uncomfortable in teaching the clinical skills due to lack of experience.

“...Immediately after my internship, I applied for a job through the Ministry of health....after six months I was posted here to teach the AMOs. At first, it was a very hard job as when I reported I found that most of the tutors were also fresh graduates like me...only four were experienced...for the lectures, it was not a challenge, but for the clinical rotations, yeah it took sometimes to cope...” (KI-AMO training school)

Some tutors participated in this study added that apart from being medical doctors; they were not equipped with the teaching methodology. Therefore, it was tough for them at the beginning of their work as trainers of adult learners. Trainer and trainee communication in training session was limited and thus creating a communication gap between the two groups. They stated that this was making life harder to the AMO trainees and in long run affecting the quality of the AMOs produced.

“... If it is the problem, I think, it is in the methodology; you know teaching is a profession.... I mean, that ability to deliver a message to the other person and yet understood... So, with regard to that problem, my advice is that it was better for evaluation to be done in the given year and the trainers receive training methodology course...” (FGD-AMO training college).

**Limited infrastructure for AMOs training**

Informants in this study revealed the existence of limited infrastructure that challenges the delivery of quality training to the AMOs. Across AMO schools, shortage of teaching materials and space for practical training were stated as the main setback to the AMOs training. With regards to the teaching materials, overhead projectors, teaching models, computers, skills laboratory and books were the main outcry of the trainees and trainers. The challenge was reported to be more pressing at the
government-owned schools.

“...We used to have enough teaching models but as time goes, they get old and now we have remained with just a few. .... We have only two overhead projectors, more than two teachers cannot go to the classes at the same time ...we have only one printer and a photocopier, all of them are aged, so it is a challenge during the examinations period.

We also do not have a computer in the office so everyone uses a personal laptop if have one...It is really challenging...” (KI- AMO training college).

Limited space for practical training was complained by students and junior AMOs across training institutions and district to limit them from acquiring the desired competencies. They added that in most AMO schools, there were many other groups of trainees and the hospitals were small and thus at the time it was not possible for them to get a chance to even see a patient during surgery due to existence of other groups. Some AMOs added that sometimes they were not even included in the schedule for practical training due to lack of space to accommodate them.

“...There are many challenges as I said in the beginning; we were like tourists in the theatre and ward rounds because of the existence of Interns who assisted almost all procedures, Medical students who were also struggling to assist and the residents. In this situation, how do you expect an AMO student to learn? ...” (KI-Kigoma).

Discussion

We aimed to explore the challenges facing AMOs training in Tanzania. Our findings have highlighted that despite the fact that in Tanzania, AMOs form the backbone of the district health system and thus the backbone of the primary health care [8, 18, 19]; and the long history of this cadre of its own kind in the Eastern, Central and Southern Africa [8]; the AMOs training is facing multi-dimensional challenges. These challenges are related to the curriculum used in AMOs training, sponsorship to AMO trainees, human resources and the teaching infrastructure. These challenges threaten the quality of AMO graduates.

The AMOs' training survived around 40 years without a written curriculum, the latter opens many questions on how the training was carried out in terms of imparting knowledge, skills, competence
and quality assurance. AMOs perform tasks shared with medical doctors as a way of curbing the critical shortage of doctors in the country [8]. According to WHO, task sharing should not compromise the quality of services rendered by that group where such tasks are shared [20].

Despite having stayed without a written curriculum for many decades, our study revealed also that the existing curriculum that was written over 15 years ago has never been revised. This happens in the AMOs training while the medical practice is changing rapidly and many medical schools in the country have been revising their training curricula regularly [21, 22]. The existing curriculum has paid little attention to the basic sciences while they are pivotal in understanding the causation of the disease and why certain decisions must be made regarding their treatment [23]. The world has transcended rapidly to competency-based education as a way of ensuring that the quality of education is improved by having competent graduates [24, 25]. Therefore, it is high time for the AMOs curriculum to be reviewed and changed to a competency-based one as opposed to the knowledge-based that exist. Furthermore, as revealed by our findings, the AMOs’ curriculum is not adding up from the clinical officers’ training, this makes the understanding of AMOs as upgraded clinical officers shaky. The authors feel that it is high time for the clinical officers’ and AMOs training to be streamlined to make the concept of upgrading a reality. Another immediate challenge posed immediately after the training of AMOs at the AMOs training schools, was the lack of a formal internship program. With the deficiencies in the curriculum and its implementation, an internship program is vital for consolidating the skills and competencies for quality services by the AMOs. Unlike Tanzania, some countries have formalized internship programs after graduation of the associate clinicians that varies between 6 and 18 months [2].

While training of AMOs is focusing on addressing the shortage of health workforce, our study has revealed the training of AMOs by itself is affected by the inadequacy of the workforce both in number and skills. This finding reflects what is reported by the Ministry of Health whereby the training institutions were reported to suffer from a shortage of 74% of the required workforce [26]. The use of inexperienced tutors who are fresh graduates and who have not received the teaching methodology course as revealed in this study poses many challenges in the process of imparting knowledge and
skills to the AMOs. As a task sharing strategy and a mature-age entry of trainees who have pre-service training and clinical experience in many areas demand to have tutors who have adequate experiences in both teaching and services provision who can give practical examples from the field. The challenges associated with infrastructure and existence of multiple trainees and thus limited opportunities for practical training as unveiled by this study bring another dilemma in the AMOs training in Tanzania. Although not explicitly the same as what our study has documented, studies from different places in Sub-Saharan Africa reveal inadequacies in the training of the associate clinicians [6, 27–30]. Limited teaching materials as revealed in this study, bring in the challenge of quality of graduates. The control of exams, the acquisition of practical skills before touching real patients and other practical skills are compromised. Not only for Tanzania but countries where associate clinicians are trained and the question of limited resources is a subject, priority should be given in provision of the basics in training for quality of care to be guaranteed.

Trustworthiness

According to Dahglen and Granheim [31] trustworthiness of a study in a qualitative study is attained when the findings of such a study are worth believing. The four Guba’s criteria were used to enhance the trustworthiness of the findings of this study [32]; credibility, dependability, transferability, and confirmability [32]. The credibility of the findings of this study was enhanced through the triangulation of informants with experiences and rich information on the study questions. In order to enhance the credibility and dependability of this study, we used the triangulation of data collection techniques, study settings, and researchers. Data were collected using interview guides and a focus group discussion guide in four different zones with different cultural and socio-economic activities. In order to confirm that the findings reflected informants’ perspectives rather than the researchers’ understanding of the question under study, categories were inductively generated using content analysis and presented with the support of sub-categories and quotes. The transferability of the findings of this study is enhanced through the description of the study setting, context, data collection process, and analysis.

Conclusions
Training of the Assistant Medical Officers as revealed in this study is facing many challenges and thus ultimately threatening the quality of health care services provided by this cadre as a task-sharing strategy. For the AMOs to reliably fulfil the aim intended for this cadre, it is high time for revision of its curriculum to align it to competency-based education. Furthermore, resources should be solicited and regular review of the curriculum be conducted. As the AMO training is an in-service programme aiming at improving the performance of an existing cadre, rather than an addition of new workforce, provision of sponsorships by the government or through other development partners need to be given high consideration to ensure the quality of this training. Employing experienced tutors and provision of teaching methodology course to all tutors before they start teaching and refresher's training regularly is another important strategy that can help in resolving the challenges pertaining human resources at the AMO training schools. For infrastructure, efforts should be invested in renovating the existing infrastructure and improve the supply for this cadre to attain the needed competencies. Finally, our findings reflect the situation by the time when this study was carried out.

Declarations

List of Abbreviations

Not applicable

Ethical Approval and Consent to participate

Provided and detailed in the method section

Consent for publication

Contained in the ethical approval

Availability of data and Materials

Transcripts are available. However, sharing is limited for confidentiality reasons.

Competing interests

The authors declare that they have no competing interests.

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Authors’ contributions

NS conceived the study, participated in its design, data collection, participated in data analysis and in drafting the manuscript. AA and LM participated in the design, data collection, data analysis and participated in drafting the manuscript. SM participated in the design, analysis of the data, drafting the manuscript and was the overall coordinator of the study. All authors read and approved the final manuscript.

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Figures

Figure 1

Challenges facing AMOs’ training in Tanzania