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Assessment of clinical practical training in Tanzania health training institutions

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Abstract

Background: The process of producing competent human resource for health by using Competence-Based Education and Training (CBET) approach requires plentiful investment of resources in teaching at the classroom and practical/clinical setting. The achievement of clinical competence is acquired in stepwise starting from classroom teaching to skills laboratory teaching, finally to the clinical setting. In addition, World Health Organization (WHO) advocates for skilled and motivated health workers in providing quality health care services and increase performance of health systems. Moreover, Primary Health Care Development Program of 2007-15 needs the Nation to strengthen and expand health services at all levels. This can only be achieved when the Nation has adequate, appropriately trained and competent work force that can be deployed in the health facilities to facilitate the provisions of quality health care services.

In the CBET approach, the goal of becoming competent is achieved through imparting hands-on practical experience and the use of activating methods in interaction between facilitator and students.

The purpose of this study is to assess clinical practical training in Tanzania health training institutions: mainly the clinical skill laboratory and clinical rotation training

Methods: Cross sectional study was conducted at two purposively selected health training institutions (HTIs), involving HTI students in medical laboratory and clinical medicine program at NTA level 4, 5 and 6. The convenience sampling method was used and data were collected immediately after breather period. The medical laboratory and clinical medicine students were used in assessing clinical skill laboratory and clinical rotation training respectively.

Results: A total of 258 HTI students were recruited and all consented to participate in this study, 124(48%) were medical laboratory students while 134(52%) were clinical medicine students.

Focusing on HTI students' characteristics observed; Sex ratio was 1:1, mostly (98%) aged between 18-28 years while nearly half (49%) were in NTA level 5. More than half 68(55%) students had high knowledge on skill laboratory training.

The study finds out that, most of students agreed that all HTI students should attend skill laboratory and also most ofstudents attended skill laboratory regardless of their NTA level

Majority 111(83%) of students had high knowledge on clinical rotation training. Most of essential personal protective equipment (PPE) for clinical rotation were available. Clinical rotation schedules were not available in all departments

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where clinical rotation was conducted. Nevertheless, students were supervised at least twice in all departments and more than three times in two departments.

Conclusion: There some challenges in implementation of clinical practical training in HTIs; requirements, supervision. Ministry of health should ensure proper implementation of clinical practical training; skill laboratory training and clinical rotation

Keywords: Students; Health Training Institution; Skill Laboratory Training; Clinical Rotation; Competence Based Education and Training; Tanzania

1. Introduction

The socio-economic and technological changes that are taking place in Tanzania need to be supported by an effective and efficient technical education and training system, a system that adequately addresses itself to the demands of the labour market for a competent work force throughout the various sectors of society. Such a system will develop peoples' knowledge and skills so that they can live and work meaningfully in a Knowledge Based society

The process of producing competent human resource for health by using Competence-Based Education and Training (CBET) approach requires plentiful investment of resources in teaching at the classroom and practical/clinical setting. The achievement of clinical competence is acquired in stepwise starting from classroom teaching to skills laboratory teaching, finally to the clinical setting. In addition, World Health Organization (WHO) advocates for skilled and motivated health workers in providing quality health care services and increase performance of health systems [1]. Moreover, there has been aneed for the Nation to strengthen and expand health services at all levels [2]. This can only be achieved when the Nation has adequate, appropriately trained and competent work force that can be deployed in the health facilities to facilitate the provisions of quality health care services.

Tanzania adopted Competence-Based Education and Training (CBET) approach in year 2000; and in the year 2002 its implementation started in technical training colleges. Currently, the approach is used in the Technical and Vocational Education and Training sector. The introduction of CBET was intended to facilitate a paradigm shift from the traditional Knowledge-Based Education and Training [3]. Competence-based education and training (CBET)is a functional approach to education as it emphasizes that learners need to gain necessary knowledge, skills, understanding and attitudes or values to work successful in their own profession or occupation. It is regarded as a holistic approach to education.

Despite the fact that the CBET curriculum has been about twenty years since its inception in Technical and Vocational Education and Training in Tanzania, there is no clear evidence to show if trainers implement it appropriately or not. Studies have been conducted regarding the new paradigm of competence-based curriculum and competence-based approach in general. Studies have revealed that competence-based curriculum remained to be paper based rather than being practical [4-5].

Tanzania has a total number of 192 registered health training institution (HTIs). Among them, 103 have private ownership, 47 HTIs belong to government and 42 HTIs belong to Faith Based Organizations [6]. Therefore, the number of HTIs reflects that, there is a large number of student in Health training institutions and that has impact on implementation of effective practical training

Assessment of skills laboratory implementation readiness and associated student's clinical performance on neonatal resuscitation among diploma nursing schools in Tanzania showed that more than half (55.6%) of nursing school had inadequate skill laboratory requirement. Moreover, 71.1% of the respondents had good performance while nearly two thirds (60.9%) had positive perception toward the use of skills laboratory [7].

In the CBET approach, the goal of becoming competent is not achieved by the transference of knowledge from facilitator to student but, rather, through imparting hands-on practical experience and the use of activating methods in interaction between facilitator and students [8].

Skills laboratory training is an innovative clinical skill education approach of facilitation, designed to provide a learner in medical discipline with an opportunity to acquire competencies, especially skills and attitudes in an environment that is similar to the clinical setting [9]

Clinical rotation training is entire range of clinical activities in different areas or departments of teaching health facilities, where HTI students practice so to acquire relevant clinical skills to enables them to provide and participate in the delivery of health services at their respective levels. Clinical supervision and coaching by faculty to nursing graduate during internship has been reported to be inadequate, resulting to failure to gain expected clinical skills [10].

Objectives

Research objectives

The main objectives to be measured by this study are:

- To asses clinical skill laboratory training in HTIs
- To assess clinical rotation training in HTIs

The findings are expected to provide an understanding of trainee's awareness, attitude and practice towards skill laboratory training, knowledge on clinical rotation training, frequency of supervision during clinical rotation and availability of personal protective equipment (PPE) for clinical rotation and availability of clinical rotation schedules. Furthermore, suggest action for improvement.

2. Methods

2.1. Study design

This cross-sectional study used quantitative methods tocollect and analyze data. The study was conductedbetween January, 2023 and July 2023. Quantitativemethods design was used as we intended to get quantifiableinformation related to practical training their determinants.

2.2. Study setting

This study was conducted at two health training institutions (HTIs), involved laboratory students (NTA level 4, 5&6) and clinical medicine students (NTA levels 5& 6).

2.3. Sampling technique and size

Two HTIs were purposively selected (one in the lake zonal health resource centre and one on the southern highland zonal health resource centre) based on easy accessibility and availability of HTI students.The selected HTI offers clinical medicine and medical laboratory training .Convenience sampling method was used to select available students during study period, where 258 students;124 from medical laboratory training and 134 from clinical medicine training program were selected in the following NTA levels (**Table 1)**

Table 1 Number of selected students per program

NTA level	Medical laboratory	Clinical medicine	Total
4	52	0	52
5	51	76	127
6	21	58	79
Total	124	134	258

2.4. Data collection and analysis

The study included students in each program, supplies (personal protective equipments) and documents (Skill laboratory attendance registers, Clinical rotation supervision reports and Clinical rotation schedules).The study employed administering questionnaires to students, observation for availability of clinical rotation schedules and PPEs in practicum site and document review for use of skill laboratory and frequency of clinical rotation supervision

The collected quantitative data was assessed for completeness and consistency of information on a daily basis. Thereafter the data was coded and entered intothe computer database using Statistical Packages for Social Sciences (SPSS) Version 26

Anonymous dual entry was performed as a means toensure accuracy and correctness of the data entered andas a means of validation. Data was then cleaned and descriptive statistics was used to summarize data

3. Results

3.1. Socio-demographic characteristics

A total of 258 HTI students were recruited and all consented to participate in this study,

124 (48%) were medical lab students while134(52%) were clinical medicine students.

Focusing on HTI students characteristics observed; Sex ratio was 1:1, mostly (98%) aged between 18-28 years while nearly half (49%) were in NTA level 5 (Table 2)

Table 2 Socio-demographic characteristics of HTI students (N = 258)

Characteristics	**N**	**%**
Sex		
Male	130	50.4
Female	128	49.6
Age		
18-28	253	98
29-38	5	2
NTA level		
4	52	20
5	127	49
6	79	31

3.2. HTI students' knowledge on skill laboratory training

In this study five questions were used to assess knowledge of HTI students on skill laboratory training, the questions ranged from:

- What is skill laboratory?
- What is skill laboratory training?
- List any four requirements for skill laboratory training
- List any two advantages of skill laboratory training
- List any four steps in skill laboratory training

The five questions had twelve correct responses; scores for these questions were categorized into low knowledge for those who scored 0-5 correct responses and higher knowledge for those who scored 6-12 correct responses

The finding from 124 students in different NTAlevels; NTA level 4(52), NTA level 5(51) and NTA level 6 (21) indicate that more than half of students had high knowledge on skill laboratory training **(Table 3)**

Table 3 HTI students' knowledge on skill laboratory training (N = 124)

Level of knowledge	N	%
Low	56	45
High	68	55

3.3. Attitude of HTI students on skill laboratory training

The study find out that, most students agreed that all HTI students should attend skill laboratory and nearly half 61(49.2%) of the students disagreed that all students should practice in skill laboratory on their own.Moreover, mostof students 117(94.4%) agreed that there must be instructor to assist student practice in skill laboratory (Table 4)

Table 4 Attitude of medical lab students on skill lab training N=124

Statements	Strong agree	Agree	I don't know	Disagree	Strong disagree
All medical laboratory students should attend skill laboratory	74 (59.7)	47(38)	1(0.8)	1(0.8)	1(0.8)
All medical laboratory students should practice in skill laboratory on their own	22(17.7)	34(27.4)	7(5.7)	36(29)	25(20.2)
There must be instructor to assist medical laboratory student practice in skill laboratory	71(57.3)	46(37.1)	3(2.4)	2(1.6)	2 (1.6)

3.4. Use of skill laboratory among HTI students

In this study skill laboratory student attendance registers were reviewed to assess student attendance for the past three-month Dec 2022 to Feb 2023

The study finds out that most of students attended skill laboratory regardless of their NTA level **(Table 5)**

Table 5 Student skill laboratory attendances for three-month December 2022 to February 2023

		Number (%) attended skill laboratory		
NTA level	Number of students	December 2022	January 2023	February 2023
4	104	102 (98.1)	104(100)	98(94.2)
5	98	100(98)	97(95.1)	102(100)
6	94	94(100)	94(100)	92(97.9)

3.5. Knowledge of students on clinical rotation training

Knowledge of students on clinical rotation training was assessed by using four (4) questions. The questions which were asked were;

- What is clinical rotation?
- Where it is normally conducted?
- What is importance of clinical rotation?
- What are requirements for clinical rotation?

The four (4) questions had ten (10) correct responses. The ten (10) correct responses were categorized as follow; high and low knowledge for 6-10and 0-5 correct answers respectively

The study findings show that, majority 111(83%) of students had high knowledge on clinical rotation training **(Table 6)**

Table 6 HTI students' knowledge on clinical rotation training (N = 134)

Level of knowledge	N	%
Low	23	17
High	111	83

3.6. Availability of Personal Protective Equipment (PPE) for clinical rotation

This study also assessed availability of essential personal protective equipment (PPE) for clinical rotation

It was observed that most of essential personal protective equipment (PPE) for clinical rotation was available. Moreover, eye wears were not available (Table 7)

Table 7 Availability of personal protective equipment (PPE) for clinical rotation

Personal protective equipment (PPE)	Available	
	Yes	No
Gloves	√	
Apron	√	
Boots	√	
Mask	√	
Gowns	√	
Eyewear		√

3.7. Availability of clinical rotation schedules

The studies also find out availability of clinical rotation schedules in different departments where students practice.

This study find out that clinical rotation schedules were not available in all departments where students practice (Table 8)

Table 8 Availability of clinical rotation schedules in different clinical departments

Department	Availability of Rotation Schedule 1=Yes,2=No
Outpatientdepartment	2
In patient department	2
Surgery	2
Obstetric and gynaecology	2
TB and leprosy	2
HIV care and treatment clinic	2
Reproductive and child health	2

3.8. Frequency of supervision during clinical rotation

This study also reviewed documents to find out frequency of supervision during clinical rotation

The finding in this study shows that students were supervised at least twice in all departments and more than three times in two departments (Table 9)

Table 9 Frequency of clinical medicine student's supervision during clinical rotation

Department	**Frequency students' supervision** **0=None, 1= Once, 2=Twice 3=Three times and 4=More than 3 times**
Outpatientdepartment	4
In patient department	3
Surgery	2
Obstetrics and gynaecology	4
TB and leprosy	2
HIV care and treatment clinic	2
Reproductive and child health	3

4. Discussion

In the CBET approach, the goal of becoming competent is not achieved by the transference of knowledge from facilitator to student but, rather, through imparting hands-on practical experience and the use of activating methods in interaction between facilitator and students [8].

One of the characteristics of a competent professional is being able to relate practical skills to theory and vice versa.Instead of learning theory and practice separately, it is of importance to learn how to combinetheory and practice and to apply them in a realistic professional situation. A competence canbest be learned through integral assignments or projects. In carrying out real tasks, studentsare not only asked to apply knowledge from books, but they also have to reflect on the chosenstrategy, building up their own practice-theory. They are asked to draw conclusions about whatcan be improved upon next time and what needs to be further explored from a theoreticalperspective [8].

HTI students need to have sound knowledge and skills on the clinical skill laboratory and clinical rotation teaching methods. This study aimed at finding out the conduct of the clinical skill laboratory and clinical rotation training in HTI.

4.1. HTI students' knowledge on skill laboratory training

In this study, finding from 124 students indicate that more than half of students had high knowledge on skill laboratory training. All HTIs use NACTE validated CBET curricula which emphasizes on psychomotor skill training involving ensuring availability of clinical skill laboratory, in addition the implementation and assessments of these curricula also take clinical skill laboratory as one of the critical areas of training.

The aim of the clinical skill laboratory training is to assist students to acquire the necessary knowledge and clinical skills before practicing on real patients [9].

4.2. Attitude and use of HTI students on skill laboratory training

The study finds out that, most HTI students showed feature of positive attitude towards skill laboratory training and most of students attended skill laboratory regardless of their NTA level

The assessment of skills laboratory implementation readiness and associated student's clinical performance on neonatal resuscitation among diploma nursing schools in Tanzania alsoreported thatnearly twothirds had positive perception toward the use of skills laboratory and they showed good performance in skill laboratory [7].

Nevertheless, studies have reported that some HTIs has no skill laboratory and the one existing are either small in size, had inadequate requirement or *not adequately used for teaching and learning purposes which can also affect students clinical skill acquisition despite of their demonstrated positive attitude towards use of skill laboratory [5,7].*

4.3. Knowledge of students on clinical rotation training

The study a finding shows that, majority of students had high knowledge on clinical rotation training.

Student awareness on what to do during clinical rotation may contribute to acquiring of clinical skill without interfering with the patient careservices. The HTI has role to orient students on the clinical rotation practice not only to facilitate learning but also to prevent disease transmission between patient, staff and students.

4.4. Availability of Personal Protective Equipment for clinical rotation

In this study most of essential personal protective equipment for clinical rotation were available. Moreover, eye wears were not available.

The finding may be due to the ongoing socio-economic and technological changes taking place in the country,there is marked improvement in infrastructure, supplies and equipment in most health facilities.

In addition, after the occurrence of Covid 19, availability of most personal protective equipments in hospitals improved greatly in most health facilities.

Recent study revealed *that some teaching hospital had shortage of gloves for students assisting or performing clinical procedure and so limited number of clinical rotation procedures required for each student [5].*

4.5. Availability of clinical rotation schedules and frequency of supervision

Clinical supervision from experienced and competent health personnel is essential to ensure that students are constantly guided to acquire necessary clinical skills. The supervision student in clinical rotation is commonly done by HTI and designated clinical instructors who have been trained to assume instruction roles.

This study find out that clinical rotation schedules were not available in all departments where students practice.Nevertheless, students were supervised at least twice in all departments and more than three times in two departments; Outpatient department and Obstetrics &Gynaecology

Clinical supervision and coaching by faculty to nursing graduate during internship has been reported to be inadequate, resulting to failure to gain expected clinical skills [10].

The NACTVET and MoH expect that each HTI should prepare a plan to guide, help, support, teach, and assist students in carrying out their assigned tasks or duties during clinical rotation so as toimprove their performance .The implementation of the clinical rotation plan should be supervised or monitored jointly by the HTI and teaching hospital/practicum sites .

4.6. Study limitations

The limitation to this study is, findings of the study were limited to only students in two programs; medical laboratory and clinical medicine program, it is likely that student in other health programs may have different experiences in clinical practical training.

Abbreviations

- MoH: Ministry of health,
- WHO: World Health Organization
- HTI: Health Training Institution
- NTA: National Technical Award

5. Conclusion

Thus, in the light of the findings presented and discussed above, it can be concluded that, little is known on the implementation of CBET curriculum, especially the practical teaching in HTI: more than half of students had high knowledge on skill laboratory training, most HTI students showed feature of positive attitude towards skill laboratory training and most of students attended skill laboratory, majority of students had high knowledge on clinical rotation training, most of essential personal protective equipment for clinical rotation were available while some vital PPE like eye wears were not available, clinical rotation schedules were not available in all departments ,yet, students were supervised at least twice in all departments and more than three times in two departments.

Recommendation

The study focused mainly on student's perspective on practical teaching; skill laboratory training and clinical rotation training. These findings call for proper practical implementation for every HTI and also further larger study on assessment of practical training in HTI.

Compliance with ethical standards

Acknowledgments

Students in HTIs who participated in this study, Also management of the two HTIs for permission during data collection

Disclosure of conflict of interest

The authors declare that they have no competing interests financial and non - financial.

Statement of ethical approval

Ethics approval for this study has been granted by the Center for Educational Development in Health Arusha (CEDHA). Permission was sought from Management of Musoma and Sumbawanga HTIs prior to the beginning of the study,

Statement of informed consent

Informed consent was obtained from all individual participants involved in the study sample participation was voluntary and participant could withdraw from the study at any time without any implication

informed consent was sought from participants and were assured of the right to refuse to participate or to withdraw from the study at any time without any consequences.

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