

## Perceived Employability of Postgraduate Graduates from the Muhimbili University of Health and Allied Sciences in Tanzania: An Exploratory Qualitative Tracer Study Using the Framework Method to Inform Postgraduate Training Reform

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### Abstract

**Introduction:** Highly skilled and competent human resources are needed for quality healthcare services. There is a growing concern about unemployment among health professionals in Sub-Saharan Africa. Employers in many developing countries reportedly complain that graduates lack in-demand employable skills.

**Objective:** We aimed to examine the experiences of graduates and employers regarding the perceived required attributes for the employability of graduates from health-related programs in Tanzania.

**Methods:** We used an exploratory qualitative approach though this specific report focuses on the qualitative findings from a secondary analysis which was conducted from December 2022 to February 2023. Data were collected across nine regions in Tanzania, including zonal and regional hospitals. Participants were purposefully selected MUHAS alumni who graduated in 2017 or later and their immediate supervisors at regional and zonal hospitals chosen due to their capacity employment of MUHAS graduates. Data collection involved semi-structured in-depth interviews, mostly conducted face-to-face in Kiswahili. Data analysis employed the framework method for content analysis, involving transcription, familiarization, thematic framework development, coding, and indexing. The analysis specifically focused on specialist medical doctors, specialist nurses, and specialist pharmacists.

**Results:** A total of 282 in-depth interviews were conducted, comprising 238 alumni and 44 supervisors/employers. Five themes emerged from the qualitative interviews including employability and career trajectories, curriculum relevance to labour market needs, supervisory and learning experiences, workplace readiness and professional skills and working within the system and system and institutional factors affecting employability.

**Conclusion:** The employability of graduates depends on the attributes they possess, which employers considered positively. Both employers and alumni hold high expectations for the attributes of MUHAS graduates. The study suggests that graduate tracking is important for quality improvement, along with regular evaluation of competencies demanded by the labor market. The findings support a multidimensional view of employability, including knowledge, skills, personal characteristics, and social experience. The perceived facilitators and barriers to employability should be considered positively during curriculum revision.

**Keywords:** Graduate employability, Quality of programs, Qualitative research.

## Introduction

Employability represents the transition from formal education to the workforce(1). It is defined as the ability to obtain employment after graduation or a range of skills students need to master to become employable(1). Employability of graduates for the provision of quality services in healthcare apart from other requirements requires highly skilled competent human resources for health (HRH)(2–5). The growing challenge of unemployment among health professionals in Sub-Saharan Africa is becoming a cause for concern(3,4). Studies conducted over different periods have reported the escalating nature of this issue(4). The broad-reaching nature of this issue is evident in the recent graduate employability in Ghana, with nurses and midwives being no exception(3). This is due to the mass production of various cadres of nurses and midwives by government and private education in situations that exceed employers' budgetary demands for recruitment(3). The benefits of a tracer study cannot be overemphasized. Apart from providing feedback on the usefulness of the curricula and training to their current jobs, a tracer study is critical for nation-building as it determines graduates' contribution to the country's workforce (2,3). In the context of quality assurance, information from a tracer study could be used to help the institution grow, through assessment of curricula relevance and provision of empirical evidence that can be used to influence activities to improve the quality of these educational institutions' programs(6,7). Every graduate is expected to apply skills in their respective fields of employment for quality

service provision, though the balance between training, employment, and deployment of specialists remains a challenge(5). Notably, anecdotal evidence provides that employers and other stakeholders of the graduates in many developing countries are complaining that they lack employable skills that are in high demand in the labour market(4,6). For instance, a recent survey of graduates from MUHAS has highlighted the lack of entrepreneurship skills among most graduates of certain programs. Existing data shows that the latter is a significant problem that the current MUHAS postgraduate curriculum has failed to address and has led to their inability to adapt to the changing job market and economy(7,8). According to the National Bureau of Statistics, a total of 64.9% of Tanzania's employees are in the private sector, whereas the public sector accounts for only 35.1% of total employment(9–11). We aimed to explore the experiences of graduates and employers on the perceived required attributes for the employability of graduates from health-related programs in Tanzania.

## Methods

### Study design

This study was part of a larger tracer study conducted as part of the requirement to review and update postgraduate training programs at MUHAS under the HEET project. An exploratory qualitative study provided a comprehensive analysis of the research problem. The study was conducted from December 2022 to February 2023, the study gathered information on participants' experiences, thoughts, and

expectations regarding the employability of graduates from health-related programs in Tanzania. The study was conducted in accordance to the COREQ (COnsolidated criteria for REporting Qualitative research) checklist to ensure comprehensive reporting of qualitative research practices.

### **Study settings**

The research was conducted across 9 regions, of Tanzania, the region was selected purposefully to include all zonal hospitals which are Mbeya Zonal Hospital in Mbeya, Benjamin Mkapa Hospital in Dodoma, and the Kilimanjaro Christian Medical Centre in Kilimanjaro, among others. Additional regional hospitals Iringa, Mtwara, Kigoma, Tanga, Morogoro, and Pwani were included to represent the evolving demands for healthcare services, such as renal replacement therapy and intensive care units. The study locations were chosen due to their status as the largest hospitals employing a significant number of graduates from MUHAS.

### **Study population**

The sample consisted of employers or immediate supervisors of MUHAS alumni, such as regional medical officers, medical directors, clinical services coordinators, heads of departments, and health secretaries. The participants of the study consisted of former postgraduate alumni who had received training under a competency-based curriculum and completed their program between 2017 and 2022, including Medicine, Dentistry, Pharmacy, Nursing, Public Health and Social Sciences, and the Institute of Traditional Medicine.

### **Sampling strategy**

Purposeful sampling was employed to identify study participants through a combination of strategies. Initially, the research team collaborated with regional health authorities to gather names and contact information of eligible participants, focusing on those affiliated with the postgraduate programs at MUHAS. Following this, referral sampling was utilized, where initial postgraduate alumni were identified and then connected to other alumni within the region, facilitating a broader reach within the targeted cadres. Quota sampling was applied to ensure a minimum number of participants, aiming for at least three alumni from each program and one employer or supervisor from each sampling unit until data saturation was achieved.

### **Recruitment strategy**

A comprehensive introduction was provided to all study participants to eliminate any ambiguities. Prospective participants received an information sheet detailing the study's objectives and outlining their roles should they choose to participate. Participation was entirely voluntary, and only those who signed the consent form after reviewing it were included in the study. Participants were encouraged to answer questions honestly, with the assurance that their responses were intended solely to enhance postgraduate training. Moreover, participants were guaranteed that the information collected would be handled confidentially by designated MUHAS personnel, used exclusively to improve postgraduate training at MUHAS, and kept anonymous. It was emphasized that the research

team was not affiliated with the Ministry of Health's supervision team and that this was not a fault-finding mission. The findings were intended solely for research to improve teaching and learning at MUHAS.

### Data collection

Data were collected through in-depth interviews (IDIs) using a semi-structured interview guide(12). The guides were developed to ensure consistency in the information gathered. IDIs were conducted mainly face-to-face in private settings chosen by participants to facilitate open dialogue and privacy. In a few cases, IDIs were carried through telephone calls, and the interviewee was requested to settle in a quiet room to avoid noise and distractions. All interviews were conducted in the Kiswahili language, which most Tanzanians speak well to minimize language barriers. The average time for interviews was 37 minutes and 16 seconds. Informed consent to record the IDIs was obtained verbally and in writing. Additionally, before the main study, a pilot study was conducted to test the clarity and flow of the interview guides and estimate the time required for interviews. Saturation of information was reached from 279<sup>th</sup> to 282<sup>th</sup> participants. After consenting, a digital audio recorder was used for interviews. The research team included four experienced health professionals who are faculty at MUHAS with experience in conducting qualitative studies. Moreover, the research team was trained on the study objectives and ethics so that prior assumptions and beliefs could not influence the perception or interpretation of findings. A

research assistant moderated the interviews, and the principal investigator took field notes at the same time.

The team consisted of diverse individuals with different career levels and backgrounds genders, years of experience, and schools, institutes, and departments. The composition provided the team with the capacity to collect diverse information across different programs from its stakeholders. Therefore, before data collection, the team underwent training on how to maintain researcher reflexivity throughout the study. Each of the regional teams spent the first day for a courtesy visit and introductions of the teams to the respective authorities. The first day was also used to familiarize researchers with the context of data collection as well as make appointments.

The IDI guides had several semi-structured questions focused on the positive and negative aspects of needed attributes for the employability of MUHAS postgraduate education. At the end of every interview, a debriefing session was conducted to ensure the quality of recording, consistency, as identification of new gaps and emerging issues. This enabled us to observe new leads that were to be followed.

### Data analysis

Content analysis was conducted using the framework method to systematically analyze the data as outlined by Gale. The Framework approach involves several key steps to ensure a thorough examination of data. First, verbatim transcripts of all interviews were produced to create a comprehensive dataset. The analysis began with familiarization, where the research

team immersed themselves in the data to understand the context and nuances of participants' responses.

Next, a thematic framework was developed, which included key themes and sub-themes relevant to the research questions. This framework guided the coding process, allowing the researchers to systematically categorize the data into distinct themes while maintaining the context of individual responses. Each transcript was then indexed according to this framework, enabling easy retrieval and comparison of data across different cases.

The analysis focused on three categories of human resources for health: specialist medical doctors, specialist nurses, and specialist pharmacists. By applying the framework to these categories, the research team was able to explore how the labor market absorbs these professionals and identify commonalities and differences in their experiences and expectations regarding postgraduate training. In-depth interviews (IDIs) were conducted in Swahili and were translated verbatim into English by the first author. Transcribing the audio was followed by coding the interviews for the ownership and drawing insight from the transcript. The team leader listened to the audio to detect errors and in some doubtful situations before our participant left the room as part of data cleaning and where necessary, follow-up questions were asked for clarity. Codes were grouped into sub-themes to reflect issues identified by the participants as vital to them for creating sub-themes and themes in executing the analysis work. We used extended involvement, observation and triangulation,

comprehensive and detailed explanations, rigorous documentation, and peer debriefing to ensure the trustworthiness of our findings(13,14). Throughout the analysis, the research team engaged in constant comparison, examining the data both within individual cases and across the entire dataset to refine themes and draw descriptive conclusions. This iterative process ensured that the analysis was both rigorous and reflective of the participants' perspectives. The final output was a matrix that visually represented the relationships between themes and participant responses, facilitating a clear understanding of the data and its implications for improvement. The study adhered to the Consolidated Criteria for Reporting Qualitative Research- COREQ checklist to ensure comprehensive reporting of qualitative research practices.

### **Ethical considerations**

Ethical clearance was obtained from the Research and Ethics Committee of the Muhimbili University of Health and Allied Sciences (MUHAS) number MUHAS-REC-10-2022-1392. Permission to access the study sites was obtained from the President's Office of Regional Administration and Local Government (PO-RALG), Regional Administrative Secretaries (RAS), the Regional Medical Officer (RMO), the District Medical Officer (DMO), and hospital management. Additionally, in each region, the RMO granted permission for data collection in different departments within and outside the government institutions. Written informed consent was obtained from each participant before the interview. Participants' information

was kept confidential even during the analysis and presentation of findings. We used numbers to ensure the anonymity of the source of information according to the General Data Protection Regulation Guideline (GDPR)(15).

To ensure confidentiality, the digital audio recorder was encrypted and protected with a password and stored in a locked cabinet.

## Results

A total of 282 in-depth interviews were conducted, comprising 238 alumni and 44 supervisors/employers from 13 sites for Tanzania Mainland and in Zanzibar, as shown in Table 1, with the majority of interviews being conducted in Dar es Salaam.

**Table 1: Number of IDIs by category**

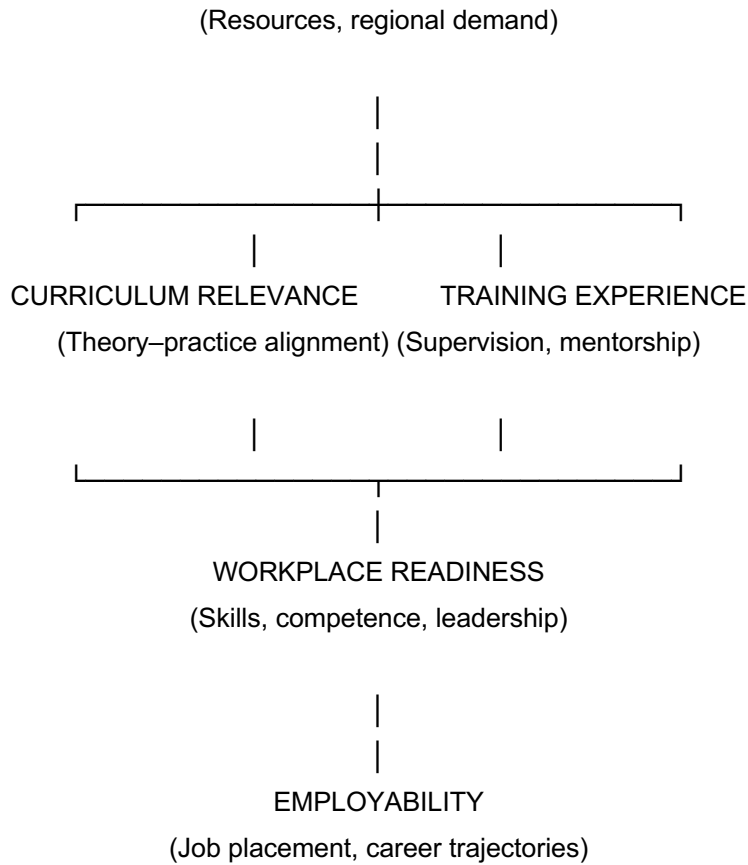
Interviewee category	Approach	Number
Alumni	IDIs	238 Interviewees
Supervisors/Employers	IDIs	44 Interviewees

The majority of study participants were alumni. Their age range was from 38 to 53 years with working experience of more than five years (Table 2).

**Table 2: Sociodemographic information of qualitative interview participants**

Characteristics	Frequency
Age (In years)	
30-40	68(24%)
41-50	158 (56%)
51-60	56 (20%)
Education	
PhD	79(28%)
Masters	113(40%)
Superspecialist	90(32%)
Cadre	
Specialist medical doctors	113(40%)
Specialist nurses	101(36%)
Specialist pharmacists	68(24%)
Working experience	
5 years	23(08%)
6-10 years	135(48%)
>10years	124(44%)

Thematic presentation of our results is reflected in figure 1 which gives a summary of results based on the obtained narratives in the context of health system.



**Figure 1. Conceptual thematic map**

Five themes emerged from the qualitative interviews including employability and career trajectories, curriculum relevance to labour market needs, supervisory and learning experiences, workplace readiness and professional skills and working within the system and system and institutional factors affecting employability. Our results were organized in themes, subthemes, and representative anonymized quotes such as employability, curriculum relevance, and training experiences (Table 3).

The findings were organized into four concept domains that explain postgraduate employability and training outcomes (Table 4).

**Table 3: Main themes, subthemes, and representative quotes**

Theme	Subthemes	Representative Anonymized Quotes
Employability and career trajectories	Rapid employment after graduation, alignment of specialization with labour market demand, opportunities in clinical practice and academia	<i>“Within three months after graduation I was recruited by a regional hospital because there are very few specialists in this field.”</i> (P07, Male, Internal Medicine)
		<i>“The training opened doors for both clinical work and teaching opportunities in health training institutions.”</i> (P09, Female, Nursing midwifery)
Curriculum relevance to labour market needs	Alignment with clinical practice, gaps in practical and technological skills, need for interdisciplinary exposure	<i>“Most of the theoretical knowledge was relevant, but we needed more hands-on exposure to advanced equipment used in hospitals.”</i> (P12, Male, Cardiothoracic Surgery)
		<i>“The curriculum should integrate leadership and health systems management because many graduates end up supervising teams.”</i> (P17, Female, Clinical Pharmacy)
Supervisory and learning experiences	Supportive mentorship, variability in supervision quality, limited structured feedback	<i>“My supervisor guided me throughout the research process and helped me connect with clinical mentors.”</i> (P04, Female, Clinical Pharmacy)
		<i>“Some supervisors were very busy with clinical work, so feedback on research sometimes took longer than expected.”</i> (P03, Male, Cardiothoracic surgery)
Workplace readiness and professional skills	Clinical competence, research and analytical skills, leadership and communication skills	<i>“The program strengthened my research skills, which helped me design and evaluate hospital programs.”</i> (P18, Male, Cardiology)

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		<i>“Communication with multidisciplinary teams was something I learned more after graduation than during training.” (P21, Female, Cardiovascular Nursing)</i>
System and institutional factors affecting employability	Health system demand for specialists, resource constraints in hospitals, urban concentration of opportunities	<i>“Many regions need these specialists, but facilities lack the equipment to fully utilize our skills.” (P14, Male, Internal Medicine)</i>
		<i>“Most opportunities are still concentrated in large cities like Dar es Salaam.” (P10, Male, Cardiology)</i>

**Table 4: Mapping of themes to concept domains**

Concept domain	Associated themes	Interpretation
Employability outcomes	Employability and career trajectories	Demonstrates labour market absorption of graduates and career mobility
Curriculum relevance	Curriculum relevance to labour market needs	Reflects alignment between training content and professional practice
Training and academic experience	Supervisory and learning experiences	Captures quality of mentorship, academic support, and research supervision
Workplace readiness	Workplace readiness and professional skills	Indicates preparedness of graduates for clinical, academic, and managerial roles
Health system context	System and institutional factors	Highlights structural factors affecting employment opportunities

## Employability and career trajectories

This theme covered factors influencing a graduate's ability to obtain and maintain employment. Key findings included reports of inadequate communication (both written and verbal) and leadership skills influencing employability. The ability to interact well with colleagues and clients/patients was considered important by employers. A lack of entrepreneurship skills was also highlighted as a problem.

Lack of entrepreneurship skills was specifically highlighted by alumni as an area needing more training.

*"Within three months after graduation I was recruited by a regional hospital because there are very few specialists in this field."* (P07, Male, Internal Medicine)

*"The training opened doors for both clinical work and teaching opportunities in health training institutions."* (P09, Female, Nursing midwifery)

Inadequate communication (written and verbal) and leadership skills were reported to influence the employability of graduates.

*"Some MUHAS Graduates are not good communicators in both written and verbal communication, you can assign them some responsibilities but you don't get feedback on time"* (Employer 03).

## Curriculum relevance to labour market needs

Employers generally perceived graduates as highly knowledgeable, even capable of training others at their workplace. However, a deficiency in counselling knowledge was noted. Alumni

reported experiencing redundancy and repetition of course content that was similar to what they were taught at the bachelor's degree level.

A deficiency in counselling knowledge was noted among graduates *"MUHAS Graduates have very strong knowledge, although they are not good counselors"* (Employer 01).

Alumni reported being taught too many theories with a lot of repetition *"Most of the theoretical knowledge was relevant, but we needed more hands on exposure to advanced equipment used in hospitals."* (P12, Male, Cardiothoracic Surgery).

*"The curriculum should integrate leadership and health systems management because many graduates end up supervising teams."* (P17, Female, Clinical Pharmacy).

## Supervisory and learning experiences

Graduates were reported to lack certain competencies required by end-users, which was suggested to be potentially due to curricula lacking innovative aspects. Inadequate exposure to basic procedures during training was reported as a contributing factor, attributed to reasons like a large number of students, limited patient volume, and specialists monopolizing procedures. Some alumni felt they lacked the skills even for minor cases and requested additional clinical attachment time in peripheral hospitals. One contributing factor suggested was a curriculum lacking innovative aspects that would enable graduates to acquire skills for employment or self-employment. Inadequacy of skills was attributed to factors including the

learning context, such as a large number of postgraduate students impairing clinical teaching and narrowing opportunities to assist with procedures. Employers specifically mentioned the lack of skills like grant writing (important for resource mobilization), leadership skills, and research skills. *“My supervisor guided me throughout the research process and helped me connect with clinical mentors.”* (P04, Female, Clinical Pharmacy).

*“Some supervisors were very busy with clinical work, so feedback on research sometimes took longer than expected.”* (P03, Male, Cardiothoracic surgery).

*“The program strengthened my research skills, which helped me design and evaluate hospital programs.”* (P18, Male, Cardiology)

Graduates reported lacking skills to handle even minor cases, like hernias or hydrocelectomies, which are often attended to at lower-level hospitals *“Some graduates cannot do a proper herniorrhaphy or hydrocelectomy despite knowing the theory. It seems they were not exposed to many procedures during their training at MNH”* (Employer 02).

Some alumni requested an additional year of training for clinical attachment at a peripheral hospital to gain more surgical skills *“I am on attachment at this hospital because I want to gain more surgical skills, especially for basic procedures such as herniorrhaphy because during my resident training, I had limited exposure. I think training a surgeon for three years is not realistic to produce a competent graduate”* (Alumni 05).

## Workplace readiness and professional skills

This theme encompassed personal characteristics. Graduates were reported to lack various soft skills, including the use of technology, resource mobilization, interpersonal skills, teamwork, respect for multiculturalism and diversity, creative thinking, and problem-solving skills. While alumni had high expectations for ethical standards, responsiveness to diversity, acknowledging limitations, and lifelong learning among graduates, some postgraduates reportedly lacked teamwork spirit, professionalism, and did not respect other cadres. *“Communication with multidisciplinary teams was something I learned more after graduation than during training.”* (P21, Female, Cardiovascular Nursing)

Stakeholders reported that some postgraduates lacked teamwork spirit, resulting in poor relationships with colleagues. Some were reported to be arrogant with egoism and poorly executing duties. Some specialists were reported as not respecting other cadres, feeling they were more informed.

Lack of professionalism *“Teamwork is key for better service delivery in the health sector. Surprisingly, we receive specialists who cannot work professionally with others. We need to look at how we mentor and supervise postgraduates during their training otherwise we will have a generation of very unprofessional specialists”*(Employer 06).

## System and institutional factors affecting employability

This theme explored how graduates operated within the practical healthcare environment. Gaps were identified between the expectations stakeholders had for graduates and the graduates' demonstrated ability in certain areas. These gaps were particularly notable in the application of entrepreneurial skills, the promotion of quality care through audits, and the incorporation of cost-effectiveness into service delivery. In this tracer study, stakeholders reported that some postgraduates were lacking teamwork spirit resulting in poor relationships with colleagues. Some alumni were reported to be arrogant with egoism worse enough were poorly executing their duties. Stakeholders reported specialization in the health sector would result in better service provision but other specialists were not respecting other cadres as they feel that they are more informed and knowledgeable. *"Many regions need these specialists, but facilities lack the equipment to fully utilize our skills."* (P14, Male, Internal Medicine).

*"Most opportunities are still concentrated in large cities like Dar es Salaam."* (P10, Male, Cardiology).

Interdisciplinary services were reported to be compromised by a lack of professionalism as a result of upbringing and mentorship which are not structured during postgraduate training at MUHAS. *"Teamwork is key for better service delivery in the health sector. Surprisingly, we receive specialists who cannot work*

*professionally with others. We need to look at how we mentor and supervise postgraduates during their training otherwise we will have a generation of very unprofessional specialists"* (Employers 03).

## Discussion

Framework analysis identified five major themes relating to postgraduate employability among graduates from Muhimbili University of Health and Allied Sciences. These themes encompassed employability outcomes, curriculum relevance, supervisory experiences, workplace readiness, and broader health system influences. Participants generally reported strong employment prospects, particularly in specialized clinical roles where national shortages exist. However, several respondents noted gaps in practical exposure and emerging technologies, suggesting opportunities for curriculum strengthening. Supervisory experiences varied, with many participants highlighting supportive mentorship, while others reported delays in feedback due to supervisors. Graduates also emphasized the importance of research, leadership, and interdisciplinary collaboration skills for workplace readiness. Finally, structural constraints within the health system including limited equipment and regional disparities in employment opportunities were identified as factors influencing career trajectories.

The findings of this study contribute to the broader Human Resources for Health (HRH) and medical education literature by highlighting how postgraduate training programs align with labour

market needs and health system priorities in Tanzania. In health professions education, employability is increasingly conceptualized as more than the simple attainment of employment; rather, it encompasses the ability of graduates to apply competencies effectively in complex health systems, adapt to evolving clinical demands, and contribute to improved health outcomes. Studies in health professions education have emphasized that employability depends on how well training institutions align curricula with national health priorities and workforce demands(16,17).The results of this study support this perspective by demonstrating that graduate employability is strongly influenced by the relevance of curriculum content, the acquisition of practical competencies, and the quality of supervisory and clinical training experiences(18). Human Resources for Health scholarship increasingly highlight that employability outcomes depend on how well educational programs align curricula with evolving health system needs and workforce demands(17).

Evidence from tracer studies conducted in Africa and other low- and middle-income countries shows that although graduates often secure employment in the health sector, they frequently report gaps in competencies related to leadership, management, research skills, and interdisciplinary collaboration(16,17). The present findings are consistent with this literature, as participants highlighted the importance of strengthening applied clinical training, professional skills, and interdisciplinary

competencies to improve readiness for the workplace(19,20).

The findings of this study also resonate with literature emphasizing the shift toward competency-based medical education (CBME). Competency frameworks emphasize measurable outcomes such as clinical expertise, communication skills, professionalism, teamwork, and systems-based practice(19). Earlier tracer research conducted at Muhimbili University of Health and Allied Sciences identified similar challenges, including gaps in system-based practice, teaching skills, and interprofessional collaboration among graduates, which subsequently informed curriculum reform toward competency-based training(16,17). These findings reinforce broader international evidence that competency-based frameworks are critical for aligning educational outcomes with workforce needs and improving health system performance(21).

This study contributes new insights to the literature by examining employability and competency alignment within the specific health system context of Tanzania, where workforce shortages and evolving disease burdens create unique demands on graduates. Alignment of postgraduate training with national HRH priorities Many existing tracer studies focus on undergraduate programs or single professional cadres(22). By focusing on postgraduate programs within Tanzania's health system, the study provides evidence on how advanced training programs contribute to addressing specialized workforce gaps(17).

Previous studies in Tanzania show that many graduates are concentrated in urban areas such as Dar es Salaam, reflecting broader HRH distribution challenges(17). Examining employability within this context helps identify whether new programs support equitable workforce distribution and service delivery. While tracer studies often emphasize graduate self-reports, this study situates employability within broader health system needs, including employer expectations, service delivery priorities, and national workforce planning.

The study explores employability for newly proposed or emerging specialized programs (e.g., cardiovascular or clinical subspecialties), a topic rarely addressed in African medical education research(2,4,8,9,17,23,24). In Tanzania, tracer studies are required for quality assurance and program accreditation. By linking graduate outcomes with curriculum design and labour market needs, this study strengthens the evidence base used by institutions and regulators to design new postgraduate programs. Taken together, these findings reinforce the importance of systematically linking medical education, labour market analysis, and HRH planning. The results suggest that graduate tracer studies can serve as an effective mechanism to: align curricula with health system priorities, identify competency gaps in emerging health professions, strengthen collaboration between universities, employers, and policymakers, and guide strategic investment in specialized health workforce training (3,5,25–28).

Overall, these findings underscore the importance of using tracer studies as a tool for continuous curriculum improvement, workforce planning, and quality assurance in health professions education. In the Tanzanian context, systematic tracking of graduate outcomes can provide valuable insights for universities, regulatory bodies, and policymakers seeking to expand postgraduate training while ensuring alignment with national HRH priorities. Strengthening feedback mechanisms between educational institutions and the health system will be essential for ensuring that future graduates possess the competencies required to improve healthcare delivery and population health outcomes(22,29,30).

### **Strengths and limitations of our study**

This study gives information from MUHAS alumni and immediate supervisors at the employment sites. As a qualitative study, the findings reflect participants' perspectives and experiences regarding employability, curriculum relevance, and supervisory support rather than providing measurable indicators of labour market outcomes. Nevertheless, the qualitative approach generated rich, context-specific insights into how postgraduate training at MUHAS is perceived to shape graduates' preparedness for the workforce, offering valuable information for institutional improvement and policy dialogue. Future research could build on these insights through mixed-method designs that combine qualitative exploration with quantitative tracer studies to measure objective employability outcomes such as employment

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rates, time to job placement, job–skill alignment, and employer satisfaction, thereby providing a more comprehensive assessment of postgraduate training effectiveness.

### Conclusion

This study highlights generally positive employability outcomes and strong demand for specialized health professionals in Tanzania, while also revealing important gaps in practical training, supervision consistency, and alignment between academic preparation and evolving labour market needs. Graduates valued the theoretical foundation and research skills acquired during training but emphasized the need for greater exposure to advanced clinical technologies, interdisciplinary teamwork, and leadership competencies required in contemporary health systems. Based on these findings, it is recommended that MUHAS institutionalize a systematic graduate-tracking mechanism, strengthen employer engagement to inform periodic curriculum review, enhance mentorship and supervision structures, and integrate additional competency-based modules such as health systems leadership, digital health, and applied clinical practice. Implementing these reforms would help ensure that postgraduate programs remain responsive to workforce demands and contribute more effectively to strengthening Tanzania's health system.

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### Data availability

De-identified qualitative data may be shared upon reasonable request or deposited in a controlled-access repository if permitted by ethics approval (The interview transcripts are available upon request; however, for confidentiality purposes, their release is limited to the research team).

### Author contributions

ON: Conceived, designed the study, carried out data analysis and drafted the manuscript for circulation to co-authors; NS: participated in designing the study, drafting, and reviewing the manuscript critically before submission; DK, MM, PT, DAM, LA, FA, LC, LM, GK, LC, EK, DK, HM, RS: collected data, worked out almost all of the technical details and participated in reviewing the manuscript for its intellectual contents before submission; EM, EB, AK: conceived, guided the study and critically revised the manuscript for its intellectual contents before submission. All authors read and approved the final version of the manuscript for submission.

### Competing interests

The authors declare that they have no competing interests.

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