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ORIGINAL RESEARCH

Barriers, Attitudes, and Solutions for Brain Health Research Training in LMICs: A Trainee Cross-Sectional Study in Uganda

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Background: Neurological disorders remain a challenge in sub-Saharan Africa, with limited expertise and credible research data to guide interventions and disease prevention. Training the next generation of clinical researchers requires a focused and concerted effort to stem the growing neurological disease burden. The US National Institute of Health (NIH) research training funded through the Fogarty International Center (FIC) Global Brain Disorders Research program gave trainees an opportunity to participate in mentored neurology research and training for 1–2.5 years. We conducted a descriptive cross-sectional study among mentees of 2 FIC research programs to assess the training experience and inform program refinement.

Methods: The data were collected via an online questionnaire created using Google Forms. All participants who had participated in the prior brain health research training programs received an online survey form. The form included a brief instruction with review guidance on the methodology to be used in training, and its objectives were provided. We used a descriptive analytical approach where we assessed the perceived interest in medical research, barriers to mentorship, satisfaction with the current mentorship and barriers to the current training program.

Results: About half of the trainees are male, and the majority, 62/72, reported that they had participated in research studies before enrolling for their training and few (11.1%) had a research experience of more than 3 years. Overall, 97.2% (70/72) reported that they were interested in conducting medical/neurology research as part of their career as a clinician, with 80.5% indicating that they were very interested. There were no significant differences across the several areas of interest regarding the level of satisfaction based on age groups and gender.

Conclusion: Barriers still exist for brain health research training in sub-Saharan Africa (SSA) and efforts to improve more protected time for research, mentorship growth and tailored research training courses are still needed to increase support for young research scientists in SSA.

Keywords: brain health, training, mentorship, research, Uganda, sub-Saharan Africa

Introduction

In low-income and middle-income countries (LMICs), a large number of young researchers are starting careers in health research with limited information about what to expect and how to overcome obstacles to career development and success.[1] Insufficient training in research skills, particularly in sub-Saharan Africa, is a significant barrier to research output and health outcomes.[1] Furthermore, health professional schools in these settings face significant challenges in

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resources, equipment, curriculum, training materials, faculty, administration staff, and funding, hindering their efforts to expand and improve training programs.[2]

To help overcome these obstacles, a comprehensive strategy involving in-country training at all levels can foster retention, enhance capacity, facilitate career growth, and offer crucial leadership.[2,3] Research training is a valuable strategy for closing the research gap and providing an opportunity for residents and junior faculty to learn and appreciate the intricacies of research through a mentored research program and prepares the trainees to become active participants and leaders in research.

To support Sub-Saharan Africa's innovative training initiatives, US National Institutes of Health (NIH) funding and support mechanisms, such as Fogarty International Center (FIC) D43 Grants and MEPI,[4,5] have facilitated the efforts of post-graduate training to develop innovative education models, attract qualified faculty, and boost multidisciplinary research. Additionally, FIC has prioritized research capacity building within standard NIH-funding independent research grants using both R21 and R01 funding mechanisms.[6,7]

The FIC Global Brain and Nervous System Disorders Research across the Lifespan program[8] supports collaborative research and capacity building projects relevant to LMICs on brain and nervous system disorders throughout life. Grant recipients develop innovative, collaborative research programs that contribute to the long-term goal of building sustainable research capacity in nervous system function and nervous system impairment.

In Uganda, the great majority of research output has been dominated by infectious/communicable diseases, with more than 57% compared to 5% for brain health research.[9] In addition, infectious/communicable diseases have attracted more training, mentorship and funding than brain health. However, strategic investments in training, research capacity, and supportive environments can alter the trajectory of brain health research. This research training promotes critical thinking, which enables the trainees to identify potential neurological clinical gaps and also promotes neurology lifelong learning. These skills are required to develop a neuro-scientist to advance clinical care, research and training. Additionally, this mentored research experience gained during this training period could influence the trainees' career choice to pursue an academic career/research career in neurology /neurological disorders, creating a significant number of specialists.[10,11]

Building upon a portfolio of FIC-funded career development and investigator initiative research focused on the brain and nervous system, 3 Uganda universities (Makerere University College of Health Sciences (MakCHS), Mbarara University (MUST), Uganda Martyrs University (UMU) and 1 US university (Case Western Reserve University (CWRU)) have developed a brain health training program which provides neurology postgraduate students and mentees with research training, and research activities that are critical to research independence and external funding. These activities are integral and incorporated into the master's training within the scholarly activities of the Masters of Medicine program in Uganda.

The Ugandan/US partnership has 3 active FIC-funded projects (NINDS/FIC 1D43NS118560-01, NINDS/FIC 1RO1NS118544-01 and NINDS 1R01NS129041-01) which also feature capacity building aspects specific to brain health research training for Ugandan trainees. The trainees have been selected from various disciplines like internal medicine, pediatrics, psychiatry, family medicine, surgery, neurosurgery, public health, obstetrics, nursing, neurosurgery, pathology, clinical epidemiology and anatomy. The NINDS-funded D43 is intended to train/support the next generation of brain health scientists, building on a robust trajectory of neurological research conducted by Ugandan and US investigators in Uganda. Research topics for the supported trainees included epilepsy, dementia and traumatic brain injury.[12–16] This 5-year D43 focusing on developing research capacity has recruited 25 mentees, including 4 PhD students, 17 masters' students and 4 junior faculty.

The five-year R01 TargetEd MAnageMent Intervention in Uganda (TEAM-U) focusing on stroke reduction by developing a self-management intervention has supported 26 masters' students. The focus of the supported research projects is mainly stroke and blood pressure control.[17–20] While the R01, epilepsy self-management intervention study has so far supported 3 masters trainees who are working on epilepsy related conditions.

The aggregate training project leadership has developed a core curriculum that both D43 and R01 mentees to participate in. This curriculum involves focused short-term courses that enable the trainees to appreciate and understand the rigours of research see Box 1 showing the courses conducted. We support the mentees within the country and tailored mentorship with local and US-based mentors.

Box 1 Topics Offered by the Training Program

Topics Offered by the Training Program
Bioethics and human research subject protection
NCD Epidemiology
Qualitative & quantitative research methodology
Data analysis
Good Clinical and laboratory practice
Implementation Science research
Grants and manuscript writing
Mentorship & Leadership
Research management

There are several formal committees/faculty oversight groups that guide trainee application review/selection, the development of formal coursework and monitor trainee progress. The educational committee is composed of multi-disciplinary team of experienced mentors, researchers and faculty. Its main role is to support the trainees and guide them as they develop their concepts so as to improve their research ideas/concepts, methodology and also provide works in progress sessions for the trainees to present research findings and writing skills. This offers them opportunities to learn and practice research presentations. The educational committee also reviews the short-term training curriculum for the trainees and also recommends training as needed. See box 1 for the short-term courses conducted for the trainees.

The Training Advisory Committee (TAC) composed of experienced researchers and trainers who guide the project management team, review selected trainees and offer advice regarding training and provision of oversight of the training program.

The trainees are also offered support through works-in-progress presentations and meetings, journal club attendances, conference presentations, manuscript writing support and publications, etc. The overall goal is to support multi-disciplinary research training in basics through translational and implementation science to address brain health and neurological disorders common across the lifespan. The trainees receive support from the program for up to one year for their research training, including guidance on design and implementation of a research project for their dissertations.

Earlier studies have reported that whereas research training is appreciated by residents in training.[21] Their voluntary participation rates are very low at 32.9%. This was attributed to heavy clinical duties, lack of time, lack of mentorship and faculty support, limited research opportunities due to lack of protected time for research.[22,23] Understanding the trainee perspectives regarding participation in research after training in our setting would help us or other training programs refine their mentorship programs. We therefore conducted a descriptive cross-sectional study among mentees of 2 FIC research programs to assess the training experience and inform program refinement by investigating our research trainees' opinions and experiences on the research mentorship program they were receiving and their future perspectives regarding research.

Methods

This was a descriptive cross-sectional study conducted among trainees participating in a brain health and stroke mentored training programs at MakCHS and MUST.

Participants

This convenience sample comprised 100 medical residents and junior faculty who have been supported by either brain health or stroke trainings from various medical fields, including nursing, radiologists, emergency medicine, neurosurgery,

pediatrics, psychiatry, public health, basic scientists and physicians who had received research training at the two training institutions in Uganda.

Regardless of their level and area of work, all those who agreed to participate in the study and this was an anonymized survey. The participants were invited to participate in the study and informed of its objectives. Only participants who were involved in the mentored neurology research training were invited to participate in the study. Participation was voluntary, and confidentiality was maintained.

Data Collection

A survey was developed by the program training mentors that included MK, MS, MKM, SNM, JN, JNN, SM, CB. Content and face validity were performed by the study team members considering the important aspects of the topic, consistency, clarity and readability of the study questionnaire.

An online survey tool was available to the participants to evaluate the training without identifying the respondents. The data were collected via an online questionnaire created using Google Forms. All participants who had participated in the prior brain health research training programs received an online survey form to fill out with brief instructions with a review guidance on the methodology to be used in training, and its objectives were provided, see supplementary file, study questionnaire.

Two weeks later, a reminder was sent to all 100 trainees who had participated in the mentored research program. Of these, 72 trainees (n = 72, 72%) completed the questionnaire. Participants were informed about the aims of the study and were asked to provide their consent to participate at the beginning of the questionnaire. The form consisted of basic demographic information, multiple-choice questions using a Likert scale to collect information on perceived interest in medical research, barriers to mentorship, satisfaction with the current mentorship and barriers to the current training program, and a space for other comments.

Two of the authors, MK and MKM jointly identified the responses and characterized them into themes that best suited the responses and comments received. Each of the comments was then themed independently by the two authors, and the results were compared, if authors disagreed on the theme assignment, a third author adjudicated the disagreements. Participants received an Email including a detailed online consent form (that included information about the purpose of the survey) and a google link to access the survey. The survey remained open for 4 weeks from October 10th, 2023, to December 11th 2023, with a remainder Email sent every two weeks after the initial recruitment email.

Data Analysis

Summary statistics including proportions (in percentage) and median were used to report demographic data and responses to closed-ended questions. Level of interest and satisfaction were compared between age groups and gender using chi-square test (or Fisher's exact test when expected cell counts are less than 5 in 20% or more of cells). Differences with p-value less than 0.05 were considered statistically significant.

Results

Over half of the respondents were male (38/72, 52.8%), with a median age of 32.5 (interquartile range: 30.5–38.5) years. Fifty-eight-point two percent (38/72) of the residents and were employed by private not for profit organizations. Majority 62/72 (86.1%) reported that they had participated in research studies before enrolling for their training and few 8/72 (11.1%) had a research experience of more than 3 years. See Table 1.

General Interest in the Conduct of Research

Nearly 78% (56/72) of the participants expressed the importance of physicians participating in research while 80.6 (58/72) reported interest in conducting research during their clinical career. The interest in conducting in research during their career varied according to age groups (Chi-square test = 0.004). There were no significant differences among the age groups regarding being a research scientist, satisfaction with the mentorship program and courses conducted etc., see Table 2.

Figure 1 shows research interest.

Table 1 Demographic Characteristics of the Respondents

Characteristic	N (%)
Age median (range) in years	34.64 (27–59)
Sex	
Female	34 (47.2)
Male	38 (52.8)
Prefer not to say	0
Other	0
Current position	
Clinician	16 (22.2)
Researcher	26 (36.1)
Faculty	06 (8.3)
Administrator	24 (33.3)
Employer	
Private	14 (19.4)
Private not for profit	38 (52.8)
Public/Government	20 (27.8)
Participating in research	
Yes	62 (86.1)
No	10 (13.9)
Research experience in years	
Less than 1 year	22 (30.6)
1-3 years	42 (58.3)
More than 3 years	08 (11.1)

Table 2 Interest and Satisfaction Levels by Age Group

	Age Group in Years				
	<30	30-39	40+	Total	Test
	(N=10)	(N=48)	(N=14)	(N=72)	
Interested	0 (0.0%)	8 (16.7%)	4 (28.6%)	12 (16.7%)	0.004
Not sure	2 (20.0%)	0 (0.0%)	0 (0.0%)	2 (2.8%)	
Very interested	8 (80.0%)	40 (83.3%)	10 (71.4%)	58 (80.6%)	
Physicians to participate in research					
Interested	2 (20.0%)	10 (20.8%)	2 (14.3%)	14 (19.4%)	0.843
Neutral	0 (0.0%)	2 (4.2%)	0 (0.0%)	2 (2.8%)	
Very interested	8 (80.0%)	36 (75.0%)	12 (85.7%)	56 (77.8%)	
Interest of being a research scientist					
Interested	0 (0.0%)	18 (37.5%)	6 (42.9%)	24 (33.3%)	0.051
Very interested	10 (100.0%)	30 (62.5%)	8 (57.1%)	48 (66.7%)	

(*Continued*)

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Table 2 (Continued).

	Age Group in Years				
	<30	30-39	40+	Total	Test
	(N=10)	(N=48)	(N=14)	(N=72)	
Competitiveness for matching to speciality training					
Interested	2 (20.0%)	20 (41.7%)	6 (42.9%)	28 (38.9%)	0.410
Neutral	2 (20.0%)	8 (16.7%)	0 (0.0%)	10 (13.9%)	
Not sure	0 (0.0%)	2 (4.2%)	0 (0.0%)	2 (2.8%)	
Very interested	6 (60.0%)	18 (37.5%)	8 (57.1%)	32 (44.4%)	
Overall, how satisfied are you with mentorship at your program					
Neutral	0 (0.0%)	4 (8.3%)	0 (0.0%)	4 (5.6%)	0.561
Satisfied	6 (60.0%)	24 (50.0%)	6 (42.9%)	36 (50.0%)	
Very satisfied	4 (40.0%)	20 (41.7%)	8 (57.1%)	32 (44.4%)	
Perception of resident satisfaction					
Neutral	2 (20.0%)	8 (16.7%)	2 (14.3%)	12 (16.7%)	0.992
Satisfied	4 (40.0%)	18 (37.5%)	6 (42.9%)	28 (38.9%)	
Very satisfied	4 (40.0%)	22 (45.8%)	6 (42.9%)	32 (44.4%)	
Overall, how satisfied are you with courses involved in the program					
Neutral	0 (0.0%)	4 (8.3%)	0 (0.0%)	4 (5.6%)	0.630
Satisfied	6 (60.0%)	22 (45.8%)	8 (57.1%)	36 (50.0%)	
Very satisfied	4 (40.0%)	22 (45.8%)	6 (42.9%)	32 (44.4%)	
Leadership of program					
Satisfied	4 (40.0%)	14 (29.2%)	4 (28.6%)	22 (30.6%)	0.783
Very satisfied	6 (60.0%)	34 (70.8%)	10 (71.4%)	50 (69.4%)	

Overall, 97.2% (70/72) reported that they were both very interested and interested in conducting medical/neurology research as part of their career as a clinician. More than three quarters reported that it's important for physicians to participate in research. Regarding the motivating factors of research, 66.7% indicated that they are very interested in becoming a research scientist, and 44.4% reported that the competitiveness for matching to specialty training after medical school is important in driving their research interest. See Figure 1, showing the level of research interest among the study respondents.

Satisfaction with the Training Program

Overall, all the respondents were satisfied with the program's leadership, with 69.4% very satisfied while 30.6% were satisfied. Overall, 94.4% of the respondents were satisfied with the topics and courses included in the training program, with 44.4% very satisfied and 50% satisfied. At the same time, 94% of the respondents overall were satisfied with the mentorship provided by the training program, with 44.4% very satisfied and 50% satisfied. Most trainees showed a strong

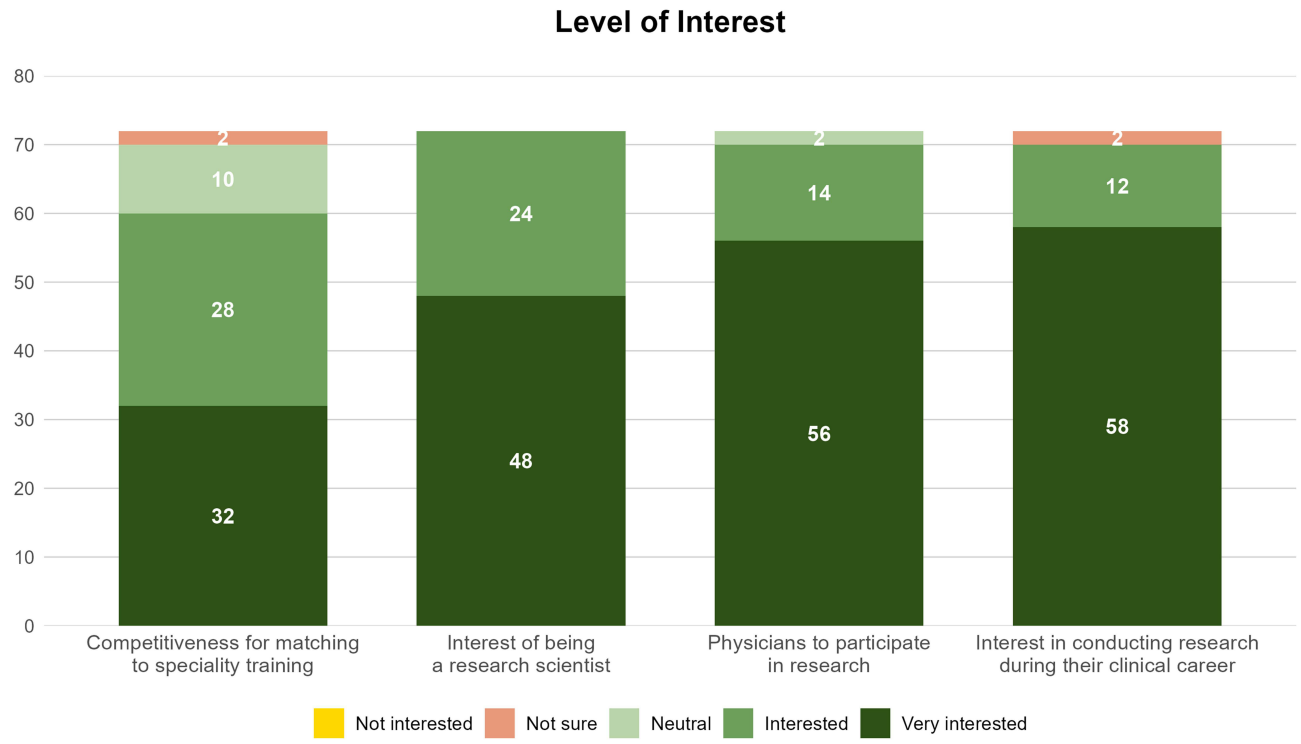

Figure 1 Showing the level of research interest among the study respondents.

inclination that research plays a crucial role in health care provision and that they need more time to learn the basics of research, see Figure 2.

There were no significant differences across the several areas of interest regarding the level of satisfaction based on age groups and gender, see Tables 2 and 3.

Barriers to Research Among the Trainees

However, about 61.1% reported the main barriers to their research are the lack of available research project opportunities and financial resources for publication or presentation of research findings. Similarly, 56.9% reported the limitations of attending conferences, lack of protected time for research, lack of research mentors, and lack of physical resources like computers or internet. The lack of access to medical research articles and the lack of research culture at their institution were reported as barriers by 22.2% of the trainees. See Figure 3.

When the trainees were asked which barriers exist regarding improving their mentorship experience after training, 22% (16/72) of trainees noted that some mentors or supervisors allocated do not value or prioritize the perceived value of student mentoring. Twenty-four (33.3%) reported that funding challenges still exist for them to continue with neurology research. Twenty reported the lack of available faculty to continue supporting them, as their neurology interests lack research mentors to guide and supervise them. About 22.2% (16/72) reported no barriers existed for them and plan to actively pursue neurology research upon completion.

Participants suggested areas that need improvement to make the mentorship program better; these included training on learning and life balance to guide the trainees, especially on handling family and educational responsibilities, research presentation skills, systematic review and meta-analyses in the topics that are tailored for research support training. Others proposed offering opportunities for trainees' short-term placements in ongoing research projects to learn the practical aspects of research. Others advocated for the allocation of time for research and the provision of protected time from clinical work to enable them to concentrate on the research activities in a timely manner.

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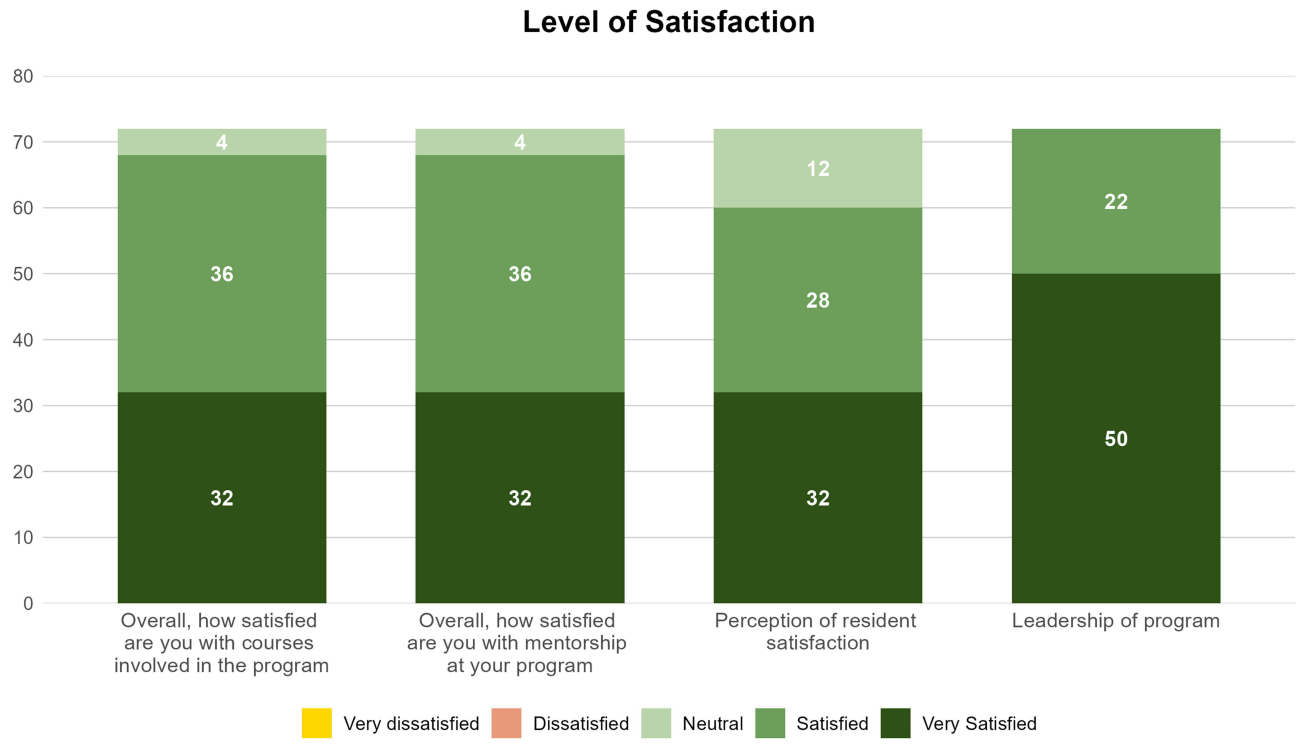

Figure 2 Showing the level of satisfaction among the study respondents.

Discussion

This evaluation of mentees from 3 FIC-funded Global Brain Health Programs focusses on the resident mentees' experience and attitudes toward research and their perceived barriers affecting their research development and participation. It also provides insights into future training programs and the further training required to move junior faculty and trainees to research independence. The fields of neurology or neurology-related clinical care and research are rapidly evolving and training curricula should keep up with these changes. The opinions of recently completed trainees are important to identify strengths and opportunities for improvement in the current research training curriculum. To the best of our knowledge, this is the first survey among brain health-related trainees in Uganda, and several of the findings are

Table 3 Interest and Satisfaction Levels by Gender

	Gender			
	Male	**Female**	**Total**	**Test**
	(N=38)	**(N=34)**	**(N=72)**	
Please pick the term that best describes your interest in becoming or being a researcher				
Interested	7 (18.4%)	5 (14.7%)	12 (16.7%)	0.302
Not sure	0 (0.0%)	2 (5.9%)	2 (2.8%)	
Very interested	31 (81.6%)	27 (79.4%)	58 (80.6%)	
Please pick the term that best describes your interest in becoming or being a researcher				
Interested	9 (23.7%)	5 (14.7%)	14 (19.4%)	0.223
Neutral	0 (0.0%)	2 (5.9%)	2 (2.8%)	

(*Continued*)

Table 3 (Continued).

	Gender			
	Male	**Female**	**Total**	**Test**
	(N=38)	**(N=34)**	**(N=72)**	
Very interested	29 (76.3%)	27 (79.4%)	56 (77.8%)	
Please pick the term that best describes your interest in becoming or being a researcher				
Interested	12 (31.6%)	12 (35.3%)	24 (33.3%)	0.738
Very interested	26 (68.4%)	22 (64.7%)	48 (66.7%)	
Please pick the term that best describes your interest in becoming or being a researcher				
Interested	17 (44.7%)	11 (32.4%)	28 (38.9%)	0.159
Neutral	3 (7.9%)	7 (20.6%)	10 (13.9%)	
Not sure	0 (0.0%)	2 (5.9%)	2 (2.8%)	
Very interested	18 (47.4%)	14 (41.2%)	32 (44.4%)	
Your satisfaction with your research mentoring program [Overall, how satisfied a				
Neutral	0 (0.0%)	4 (11.8%)	4 (5.6%)	0.055
Satisfied	18 (47.4%)	18 (52.9%)	36 (50.0%)	
Very satisfied	20 (52.6%)	12 (35.3%)	32 (44.4%)	
Your satisfaction with your research mentoring program [Perception of resident s				
Neutral	7 (18.4%)	5 (14.7%)	12 (16.7%)	0.880
Satisfied	15 (39.5%)	13 (38.2%)	28 (38.9%)	
Very satisfied	16 (42.1%)	16 (47.1%)	32 (44.4%)	
Your satisfaction with your research mentoring program [Overall, how satisfied a				
Neutral	0 (0.0%)	4 (11.8%)	4 (5.6%)	0.055
Satisfied	18 (47.4%)	18 (52.9%)	36 (50.0%)	
Very satisfied	20 (52.6%)	12 (35.3%)	32 (44.4%)	
Your satisfaction with your research mentoring program [Leadership of program]				
Satisfied	12 (31.6%)	10 (29.4%)	22 (30.6%)	0.842
Very satisfied	26 (68.4%)	24 (70.6%)	50 (69.4%)	

worthy of further discussion. Several barriers still remain in regard to research training in Uganda and sub-Saharan Africa that need to be addressed.

This study did not find any significant differences in the levels of interest and satisfaction based on gender differences. However, gender-based disparities among researchers remain within neurology researchers in Uganda and similar settings. Whereas the training projects try to allocate mentees in a ratio of 1:1, we still note that female mentees constituted a little less than half (47.2%). Identifying female academic mentors both locally and internationally in academic neurology and research is needed to provide motivation and guided mentorship for women to enrich neurology research and training in Uganda. Failure to address these inequalities fosters a picture that some specialties are meant for men, which discourages women and leads to inadequate mentoring further perpetuating underrepresentation of women in

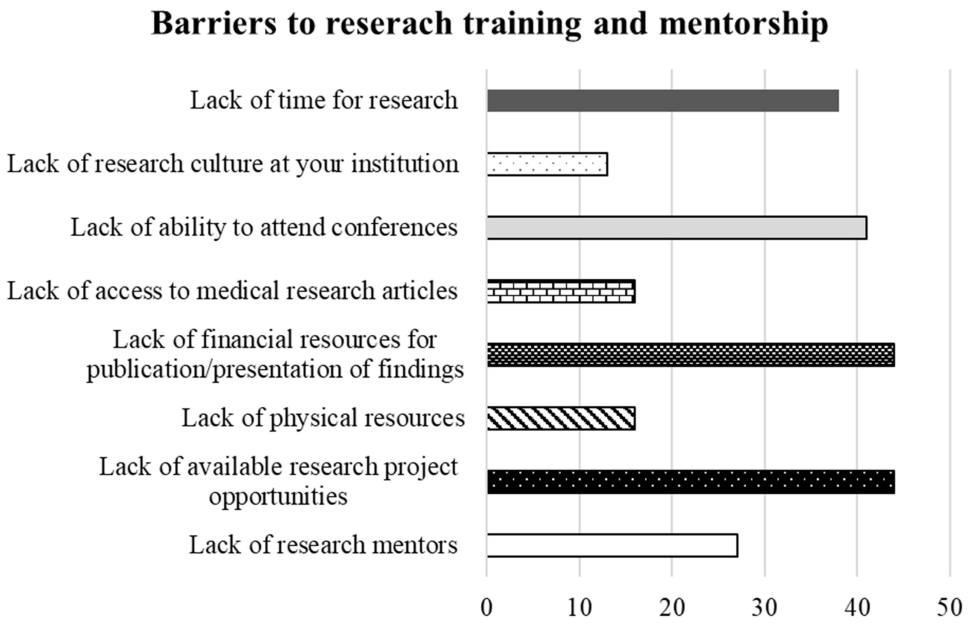

Figure 3 Barriers to Research training and mentorship.

neurology research and career development. To address gender disparities in neurology, strategies to improve transparency, promote leadership programs for women, and encourage mentorship to help them secure better positions, improve career advancement pathways, and connect with established leaders.[24,25]

The other barriers to research and research mentoring included having not enough time for research. The lack of protected research time for clinician researchers remains a hindrance to research development and conduct. Majority of clinicians who participate in research only do it after regular work hours. There is an emphasis on developing clinical skills and patient care within sub-Saharan Africa, hence impacting research career development. Advocacy and provision of research protected time is urgently needed to enable commit to research careers in our settings.

The lack of qualified mentors or lack of support for mentors also worsens the lack of protected time. Mentorship and sponsorship are crucial pathways to developing good research careers, particularly alongside busy clinical careers. The lack of established research structures and senior research colleagues well -trained in research methodology dampens the enthusiasm of aspiring junior researchers who are juggling research and clinical care. Coupled with no or very few numbers of qualified neurologists in LMICs, this impacts neurology care and research. Thus, many budding LMICs researchers are not afforded the opportunities derived through their mentors' networks. The training projects help to bridge this gap and provide experienced US-based neurology researchers with a keen interest in global health and mentorship. We still continue to grapple financial issues to support conference attendances, travel grants, in-person networking etc. and logistical problems such as internet and availability of journal materials still contribute to research barriers.

However, despite the barriers above, the program had several positive attributes that were noted by the mentees and supported their research career development. The mentees were positive about research and valued research contributions to their clinical care. Developing a continuum of training or "pipeline" of clinician-scientist training by providing a range of opportunities for students, trainees or fellows to negotiate their journey across years of arduous training is critical. Participants reported positive attitudes towards neurology research similarly to and were eager to continue pursuing a career in neurology research.

Few reported barriers to learning basic research methods, however, it is worth noting that all the resident programs at MakCHS and MUST offer a research methodology course that covers the basic research methodologies. However, this course might be insufficient in equipping the trainees with all the necessary tools to conduct research independently,

hence the request for attachments to ongoing research projects to learn the practical aspects of research methodologies to increase the trainees' knowledge, experience, and confidence.

The way forward to refine and improve training in Brain Health Research in Uganda.

To address and refine the neurology research training programs as well as addressing the mentioned barriers, we need to re-tailor the didactic training modules and include practical sessions, align the sessions to attachments to ongoing research projects or research processes like proposal writing, data analysis and include presentation skills for posters and oral presentations for our trainees. Incorporating online workshops or training sessions for mentors that might be based in high-income countries or limited by lack of time to conduct didactic trainings provides an affordable, accessible, and flexible option that might increase the trainees experience and have favorable outcomes.[26] The inclusion of recorded webinars for specific didactic research sessions that offer an opportunity for self-paced learning may be another way to cover all aspects of research methodology, academic writing, and biomedical statistics. Mentored research can also foster a thriving community of well-trained junior faculty, which is crucial for improving health outcomes in LMICs.[2,3,27]

Improvement of physical resources such as providing stable internet connectivity at faculties and hospitals is a big step in addressing the barriers. Stable internet is only available for trainees on campus at medical school; however, efforts to further extend this to the clinical working areas within the hospital remain a challenge. There is a need to organize annual conferences/seminars on topical neurological issues for trainees to present their work and include other junior students to encourage scholarly work even with limited funding.[28]

Limitations and Strengths

Our findings resulted from a self-reported online questionnaire without objective assessment of the research-related knowledge and confidence. This involved only residents or junior faculty that had participated in research training sessions and might not be generalizable to the rest of the residents. We did not perform construct and criterion validity for our study questionnaire, hence making it difficult to generalize our findings to broader training or mentoring programs elsewhere and may be difficult to predict the outcomes associated with the trainings.

Conclusion

Reforming brain health training and research requires trainers to recognize student or trainee perspectives to ensure that the training is relevant. Whereas several barriers still exist for brain health research training such as lack of training and research mentorship, aligning research mentorship to adaptable training models, improving advocacy and developing resource-efficient solutions to ensure that the next generation of neurology research scientists are well equipped to address brain health disorders is needed. Efforts to improve the representation of women researchers, more protected time for research, mentorship growth and adapting tailored research training sessions might help address these barriers.

Data Sharing Statement

The authors declare that data supporting the findings of this study are available within the article.

Ethics Approval and Consent to Participate

This study was performed in line with the Declaration of Helsinki. Written informed consent was obtained from potential participants at the beginning of the online questionnaire, and all those who agreed to participate were included in the study. The participants were informed that their participation was voluntary and that their responses would remain anonymous. Approval to conduct the study was granted by the School of Medicine, Research and Ethics Committee (SOMREC) Mak-SOMREC-2023-648 and Uganda National Council of Science and Technology (UNCST); HS2944ES.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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