Commentary

# Training Non-Neurologist Healthcare Professionals in the Recognition and Management of Movement Disorders in Malawi

**Mayeso Naomi Victoria Gwedela[1], Matthew Mwale[2], Miriam Munthali[2], Tiwonge Elisa Phiri[2], Yohane Gadama[3,4]**

1. Biomedical Sciences Department, Kamuzu University of Health Sciences, Private Bag 360, Blantyre, Malawi
2. Queen Elizabeth Central Hospital, Ministry of Health, Blantyre, Malawi
3. Medicine Department, Kamuzu University of Health Sciences, Private Bag 360, Blantyre, Malawi
4. Malawi-Liverpool Wellcome Trust Clinical Research Program, Blantyre, Malawi

***Corresponding Author: Yohane Gadama**; E-mail: yggadama@medcol.mw

## Abstract

**Background**

Many patients with neurological disorders in Malawi are seen by non-neurologist healthcare professionals due to the low number of neurologists available in the country. Movement disorders are a growing concern at neurology clinics and patients often present late, having spent years before getting a neurology referral. In line with the WHO's global action plan on improving neurological care, we organized a workshop for non-neurologist healthcare professionals on the clinical overview of common movement disorders.

**Methods**

The 2-day in-person workshop was held in Blantyre city and included pre- and post-workshop knowledge assessments, lectures, and neurologist-guided patient sessions. Sessions covered the pathophysiology, presentation, and management of common movement disorders (e.g Parkinson's disease, essential tremor, dystonia and chorea). At the end, participants provided feedback on the workshop through an anonymous post-workshop evaluation form with point Likert scale and open-ended questions.

**Results**

Forty-five participants from all tiers of Malawi's healthcare system, including general practitioners, internists, physiotherapists, and residents in non-neurology disciplines, attended the workshop. On reflection, many planned to improve their clinical practice with the knowledge and skills gained during the workshop. Participants expressed high satisfaction with the workshop content and the majority rated patient sessions as the most preferred type of learning format. Some sessions, including dystonia, functional movement disorders, and movement disorders in psychiatry, were rated as difficult and warranted further training. Participants felt the workshop could be improved by holding regular trainings for longer and including more primary healthcare professionals.

**Discussion**

This first workshop on movement disorders in Malawi was an effective continuing professional development program which facilitated interprofessional learning and intended changes in clinical practice. It provided lessons on improving neurological care through training of non-neurologist healthcare workers which can be adopted for other high-burden neurological disorders in Malawi.

**Keywords:** non-neurologists, movement disorders, Parkinson's disease, medical education

## Introduction

Malawi is a country in southern Africa with an estimated population of 20.7 million people[1]. Similar to other low-income countries, Malawi is highly burdened with infectious and communicable diseases such as malaria, HIV/AIDS, and tuberculosis[2]. However, non-communicable diseases are an increasing concern and accounted for 32-40% of deaths and 25.4% of disability-adjusted life years as of 2018, with neurological disorders responsible for around 4.5% of their burden[3].

Specialist neurological care in Malawi is provided at Queen Elizabeth Central Hospital (QECH) in Blantyre city. Although strides have been made in the past few years, including the establishment of a weekly outpatient clinic, a dedicated neurology ward, and a stroke unit, access to neurological care is still extremely limited. The country has only two adult neurologists who are both based at QECH thus the majority of patients with neurological disorders are seen by general practitioners, internists, and other non-neurologist healthcare professionals. In 2019, the top neurological diagnoses among outpatients at QECH were headache disorders, epileptic disorders, polyneuropathies, and stroke[3]. Although the trend has remained largely unchanged, the incidence of movement disorders at the QECH neurology clinic is on the rise. Parkinson's disease is the most common and over 50 patients are seen at the clinic, with at least one new diagnosis every month[5]. Patients with movement disorders often present late to the clinic, with many spending years across all tiers of the healthcare system before being referred for specialist neurological care.

The World Health Organization's intersectoral global action plan on epilepsy and other neurological disorders calls for training and educating a multidisciplinary healthcare workforce on identifying and managing neurological disorders as one way of ensuring provision of effective, timely and responsive diagnosis, treatment and care[6]. We therefore organized a workshop which provided non-neurologist healthcare professionals with an overview of common movement disorders with the goal of improving patient care through early recognition, diagnosis, and timely referrals to specialist neurological care.



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## Methodology

The two-day in-person workshop was held in September 2025 at Kamuzu University of Health Sciences Mahatma Gandhi Campus in Blantyre, Malawi. It was announced four weeks prior through an electronic flyer and targeted residents, general practitioners, clinicians, and physicians. Workshop facilitators had expertise in neurobiology, adult neurology, movement disorders, psychiatry, and paediatric neurodevelopment, respectively. The workshop was approved as a continuing professional development activity (10 points) by the Medical Council of Malawi.

The workshop consisted of a pre- and post-workshop knowledge assessment, lectures, and neurologist-guided patient sessions. Day 1 focused on physiology of movement, general approach to movement disorders, and the pathology, presentation, and management of Parkinson's disease and essential tremor, respectively. Day 2 addressed dystonia, functional movement disorders, and common movement disorder in paediatric, psychiatry, and post-stroke patients, respectively. Two sessions, general approach to movement disorders and functional neurological disorders, were delivered virtually via Zoom by a movement disorders specialist. The pre- and post-workshop knowledge assessment comprised 11 multiple choice questions on video cases depicting patients with various movement disorders. The assessment was custom-designed through expert consensus by the workshop facilitators to reflect local clinical context and the learning objectives of the workshop.

At the end of the second day, participants completed an anonymous post-workshop evaluation form for their input on retrospective and prospective benefits of the workshop, its impact and outcomes, program content, delivery, general logistics, and areas of improvement. Structured feedback on program content, logistics, and overall workshop satisfaction was obtained through 5-point Likert-type scales anchored as 5 = strongly agree/very satisfied/very relevant, 4 = agree/satisfied/relevant, 3 = neutral, 2 = disagree/dissatisfied/irrelevant, 1 = strongly disagree/very dissatisfied/very irrelevant 7. Open-ended questions were used to obtain feedback on the benefits, impacts, outcomes, and areas of improvement of the workshop.

## Standard protocol approvals

The study was exempted from institutional review board approval because no identifying information was obtained with the knowledge assessment and workshop post-evaluation surveys, respectively. Prior to the surveys, participants were verbally informed of the intention to use the data for publication. Consent was therefore implied through the voluntary completion of the surveys.

## Data availability

Anonymized data not published within this article will be made available by request from any qualified investigator.

## Results

### *Description of participants*

Forty-five participants were shortlisted from 70 applications. Shortlisting was based on clinical qualification, field of specialty, current work institution, and position at workplace.

Excluded applicants included those with a certificate as the highest qualification, working in a setting without primary contact with patients, and whose field of specialty was unlikely to assist patients with movement disorders. Thirty-seven participants attended (18 male, 19 female) attended the workshop and are described in Table 1. Reasons for non-attendance among shortlisted participants were schedule changes (37.5%), no reason given (37.5%), and no-show (25%). Thirty-two participants (85%) completed both the pre- and post-workshop assessment and 30 (81.1%) filled the post-evaluation forms with completion rates ranging from 93.3% to 100%.

**Table 1: Participant characteristics**

| Variable | | n (% of total) |
|---|---|---|
| Qualification level | Diploma | 5 (13.5) |
| | Bachelor of Science | 7 (18.9) |
| | Bachelor of Medicine Bachelor of Surgery | 19 (51.4) |
| | Master of Science (MSc) | 2 (5.4) |
| | Master of Medicine (MMED) | 4 (10.8) |
| Specialty | General medicine | 13 (35.1) |
| | Internal medicine | 8 (21.6) |
| | Paediatrics | 3 (8.1) |
| | Physiotherapy | 4 (10.8) |
| | Psychiatry/mental health | 8 (21.6) |
| | Emergency medicine | 1 (2.7) |
| Institution | Health centre | 4 (10.8) |
| | District hospital | 4 (10.8) |
| | Central hospital | 22 (59.5) |
| | Private hospital | 2 (5.4) |
| | Research institution | 5 (13.5) |
| Clinical practice experience (years)* | <1 | 1 (2.8) |
| | 1-3 | 13 (36.1) |
| | 4-6 | 6 (16.7) |
| | 7-9 | 7 (19.4) |
| | ≥10 | 9 (25) |

***One participant wrote qualification instead of years in experience**

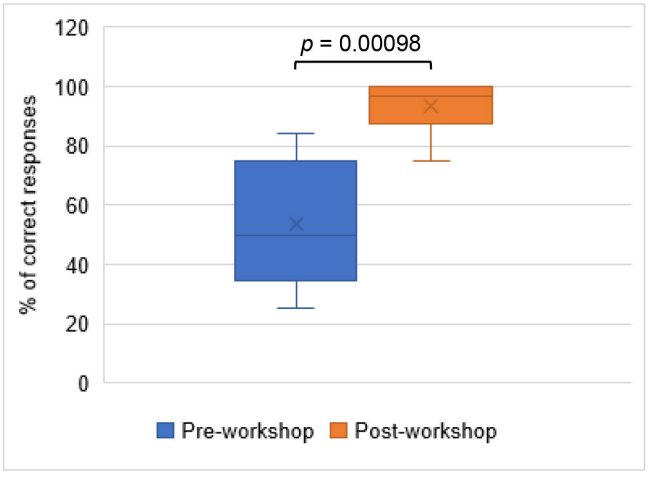


**Figure 1. Pre- and post-workshop knowledge assessment. A box plot showing the group percentage of correct responses to 11 knowledge assessment questions immediately before and immediately after the workshop.**

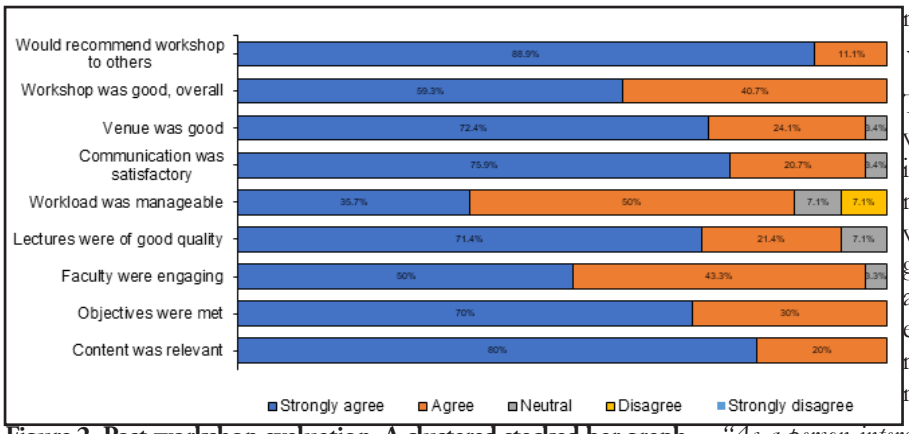


**Figure 2. Post-workshop evaluation. A clustered stacked bar graph of summative 5-point Likert scale responses to the post-evaluation survey.**

**Table 2: Areas where attendees wanted further training (n = 20)**

| Area | No. of responses, n (%) |
|---|---|
| Dystonia | 6 (30) |
| Functional movement disorders | 5 (25) |
| Movement disorders in psychiatry | 4 (20) |
| Patient assessment | 3 (15) |
| Physiology of movement | 2 (10) |
| Paediatric movement disorders | 2 (10) |
| Myoclonus | 1 (5) |
| Tremor | 1 (5) |
| Botox administration | 1 (5) |

### *Knowledge gain*

Overall, participants demonstrated a marked improvement in knowledge following the movement disorders workshop, indicating substantial enhancement in participants' knowledge (Figure 1). The median percentage of correct responses significantly increased from 50% before the workshop to 96.9% after (Two-tailed Wilcoxon signed-rank test, $p = 0.00098$, standard deviation = 11.22, effect $r = 0.87$). Improvement was observed across all 11 assessed questions. The largest increases were noted in questions assessing the recognition of Parkinsonism and the differentiation of tremor types, reflecting strengthened diagnostic understanding.

### *Personal benefits of the workshop*

Prior to the workshop, participants expected to improve their knowledge of common movement disorders, enhance diagnostic and management skills, and network with colleagues. Reflecting on the workshop, they had gained confidence and clinical skills in movement disorders, including differentiating among tremor types, patient assessment, and knowing when to seek a referral. One attendee further expressed interest in pursuing neurology as a career.

*"I now know not every tremor is Parkinson's. I know I can work up patients with movement disorders without needing imaging to make a diagnosis."*

*"The workshop has shown me the problem of movement disorders is wide. There is more that we can do; more that I can do. This training has opened my eyes and now I can try resolve these issues in my everyday clinical work."*

Based on what they had learned during the workshop, most participants planned to make changes in their clinical practice by incorporating neurological examination during patient consultations and making appropriate referrals to specialist neurology clinics.

### *Workshop impact and outcomes*

The participants felt the workshop would contribute to patient care through identification of research gaps in movement disorders, knowledge sharing with co-workers, engagement with the global movement disorders community, and reduction of morbidity through early recognition, correct diagnosis, and management of patients where referral to neurology is restricted.

*"As a person interested in research, this workshop uncovered the wide knowledge gap that exists with movement disorders in Malawi and how as the new generation of healthcare providers, we can do something about it."*

*"Patients with movement disorders will be appropriately managed instead of being neglected."*

*"I have become aware of the MDS and have joined the no-fee membership to further my learning."*

### *Workshop delivery and presentation*

Feedback indicated high satisfaction with program content, workload, lecture quality, and facilitator delivery (Figure 2). Patient sessions were the most preferred learning format, with attendees describing them as extremely useful in consolidating the pathology of movement disorders with their clinical presentation and providing practical skills in clinical examination of patients.

### *Areas for further training*

Among the aspects of the workshop described as particularly difficult were the pre-workshop knowledge assessment, pathophysiology and pharmacological management of movement disorders, and functional movement disorders. Attendees were asked to list areas where they wanted further training, with multiple responses allowed per attendee. Twenty attendees provided responses and the most frequent areas were dystonia, functional movement disorders, and movement disorders in psychiatry (Table 2).

### *Improving the workshop*

When asked how the workshop could be improved, participants suggested holding frequent trainings, involving more healthcare professionals from district hospitals, holding patient sessions at outpatient clinics and in hospital wards, and avoiding virtual livestreams which were marred by poor internet connectivity. A good number felt that some sessions were rushed and thus wanted the workshop to run for more than two days.

## Discussion and lessons learned

This first-of-its-kind workshop was aimed at providing non-neurologist healthcare professionals in Malawi with knowledge of the pathophysiology, clinical presentation, diagnosis, and management of movement disorders to ultimately improve the quality of patient care. The majority of participants who attended the workshop expressed plans to make changes in their clinical practice based on the knowledge and skills gained.

Although data about the workshop's impact on planned change in healthcare delivery practice for movement disorders is beyond the scope of this report, research studies

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and reviews in other medical specialties have shown that targeted educational interventions can enhance the capacity of non-specialist healthcare professionals to conservatively identify, assess, and manage disorders in resource-limited settings, ultimately improving patient care[8,9]. With the current shortage of adult neurologists in Malawi and indeed most of Africa, movement disorders trainings for non-neurologist physicians, internists, and allied health professionals can address this challenge in the short-term[10].

The positive feedback from participants indicates that the workshop was a generally effective continuing professional development program which inspired curiosity about neurology, created engagement through peer discussions and patient sessions, facilitated meaningful interprofessional learning, and offered support for intended change in clinical practice[11]. However, several limitations must be considered. In as much as all the workshop participants were healthcare professionals, their varied education and professional backgrounds made it challenging to design sessions tailored to discipline-specific needs for maximum impact. In addition, the in-person nature of the workshop meant that the applications received were biased towards healthcare professionals who resided close to the venue. Indeed, many healthcare professionals from outside Blantyre city, including general practitioners from health centres and district hospitals whose training in movement disorders would be particularly impactful, likely did not apply for the workshop due to logistical barriers. Finally, due to the once-off crash-course nature of the workshop, knowledge, skills, and competencies gained may not be sustained by the applicants in the long-term. Future workshops could include follow-up evaluations after 3 and 6 months to assess actual long-term changes in clinical practice.

With these limitations and participants' feedback, the movement disorders workshop offers lessons in improving neurological care through training of non-neurologist healthcare professionals in Malawi. In the future, we may consider organizing longer workshops to allow ample coverage of sessions. With resources allowing, we could also organize regular multiple movement disorders workshops within the three regions of Malawi to reach a wider and more varied pool of healthcare professionals. In addition, adopting a train-the-trainer model with key professionals such as heads of departments or hospitals to train and supervise their juniors can scale up a cascade of knowledge and skills-transfer to all tiers of Malawi's healthcare professionals[12-14]. Neurology specialty is still in its infancy in Malawi and the experience from this workshop will also inform similar workshops in other high-burden neurological disorders such as stroke, epilepsy, and headache.

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## Author contributions

MNVG: Study conception, data acquisition and analysis, drafting and revision of the manuscript,

MM: Study conception, data acquisition and analysis, revision of the manuscript

TEP: Revision of the manuscript

YG: Study conception, data acquisition and analysis, revision of manuscript

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