

Evaluating a Novel Multidisciplinary Preceptorship Model for Healthcare Workers in Selected Health Facilities in Zambia

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Abstract

Background

Health professions education is essential for preparing competent healthcare professionals. In Zambia, there is a need to bridge the gap between theoretical and practical applications in clinical settings. Preceptorship programs have emerged as a promising solution, providing structured, supervised clinical training for learners or newly qualified practitioners.

The University of Zambia (UNZA) and SolidarMed, under the "Advancing Vocational Clinical Education in Zambia" (ACEZ) project, introduced multidisciplinary preceptorship (MDP) training in January 2025. This was to build the capacity of healthcare professionals at four Vocational Centres of Excellence (VCEs) across three provincial hospitals and one general hospital. This evaluation assessed preceptors' competencies following the establishment of VCEs and preceptorship training.

Methods

The MDP training targeted 141 healthcare workers, cutting across professions. A 10-day standardised, competency-based workshop was conducted between January and August 2025. Pre- and post-training assessments were performed using a 50-item multiple-choice questionnaire to assess participants' change in knowledge and competency. Statistical analysis involved paired t-tests and two-way ANOVA to assess the change in scores after preceptorship training.

Results

Out of 141 healthcare workers, 131 participated in the pre-test and 130 in the post-test. The overall mean score increased significantly from 73.9% (SD = 9.9%) to 85.2% (SD = 7.5%) post-training ($p < 0.001$). The proportion of participants with competency ($\geq 75\%$ score) increased from 52.7% to 92.3%, with gains observed across all cadres. The percentage increase in competency was similar for males and females and among the different healthcare cadres, but different for health facilities:-

Conclusion

We successfully piloted multidisciplinary preceptor training, which resulted in a significant increase in knowledge and competency. The training enhanced participants' educational skills, bridging gaps in clinical education and strengthening the preceptorship framework. Future training should target nationwide preceptorship training among healthcare providers to improve clinical skills.

Background

Health professions education plays a crucial role in preparing competent and confident health care professionals to meet the needs of patients [1]. In Zambia, there is a growing recognition of the importance of bridging the gap between theoretical and practical application in providing healthcare in clinical settings.

Preceptorship programs have emerged as a promising approach to address this challenge, providing students with structured, supervised clinical experience under the guidance of experienced healthcare professionals [2, 3]. Preceptorship is a period of structured transition to guide and support learners or newly qualified practitioners from students to autonomous professionals to develop their practical skills [4]. Preceptorship programmes can be used for all health professions education students as well as those newly employed or yet-to-be-employed graduates (NHS, 2024).

Support by an experienced practitioner and a preceptor is valuable in refining preceptee skills, values and behaviours, and to develop their confidence as independent professionals [5]. The foundation for effective patient-centred care depends on expert support and dedicated learning time. Significant benefits of a well-embedded preceptorship programme in the organisational culture are associated with retention and staff engagement. Investing in a preceptorship programme can deliver a variety of benefits for the preceptee and employer, such as enhanced patient care and experience, more confident and skilled staff and increased staff satisfaction and morale [4, 5].

To facilitate clinical-based training for students and qualified staff, the University of Zambia (UNZA), in collaboration with SolidarMed, under the project 'Advancing Vocational Clinical Education in Zambia' (ACEZ), built and equipped skills Vocational Centres of Excellence within the hospital premises in Kafue, Kabwe, Solwezi and Chipata from January 2025 to August 2025.

Some of the main project aims were: (1) To improve practical skills and competencies for clinical students through the establishment of VCEs, and (2) to improve didactic skills, capacities and content for clinical teachers through various capacity building initiatives such as preceptorship training. Therefore, this evaluation assessed preceptors' competencies following the establishment of VCEs and preceptorship training.

Methods

Design

A quasi-experimental study was conducted using a pre- and post-test design, in which participants' knowledge of preceptorship was examined before and after undergoing a structured training.

Participant selection and study setting

We set out to train 140 preceptors across four different VCE training sites; however, a total of 131 participants were trained between January and August 2025. The participants involved in hands-on practical skills were selected in collaboration with the head of training, drawn from Kafue, Kabwe, Chipata and Solwezi districts.

To be eligible, healthcare professionals should have (a) been working as clinical instructors, tutors, or mentors in health training institutions or teaching hospitals, (b) demonstrated interest or responsibility in student supervision or mentorship, and (c) been nominated by their institutions or identified as key resource persons for student supervision.

Multidisciplinary preceptorship training

The multidisciplinary preceptorship training programme combined both classroom (40% didactic) and practical (60% hands-on) learning methods. The training was facilitated by experienced educators from the University of Zambia and delivered in a workshop format.

The preceptorship training programme ran for ten consecutive days and covered seven interlinked modules. These modules built a strong foundation of knowledge, skills, and attitudes essential for effective preceptorship.

a) Training format:

- Day 1: Orientation and pre-test questionnaire (Supplementary file 1) to assess baseline knowledge
- Days 2–6: Delivery of modules using interactive workshops, clinical simulations, group tasks, and reflection sessions. Modules covered included: *Understanding preceptorship; Clinical simulation; Designing and implementing learning activities in clinical settings; Clinical assessment methods and tools; Clinical reasoning and documentation; Mentorship, supervision, counselling, and decision-making in the clinical environment; Professionalism and role modelling.*
- Day 7–10: Post-test (Supplementary file 1), practicum assessment, evaluation, and certification ceremony

b) Assessment:

- Formative assessments (reflection questions, group tasks) occurred throughout the training. The trainers also employed peer-to-peer assessment and feedback sessions to foster peer learning and build confidence and collaborative practice among the multidisciplinary participants
- Summative assessments include:
 - Post-test (minimum pass mark: 75%, contributing 50% to the overall score)
 - Practicum performance (minimum pass mark: 75%, contributing to the other 50%)
- Attendance — participants needed to attend all sessions.

On successful completion, participants earned a certificate of competence and 30 continuous professional development (CPD) points through the Health Professions Council of Zambia.

Data collection tool

We administered a 50-question multiple-choice item pretest questionnaire (Supplementary file 1), generated from the training materials, to the participants before the training intervention to assess their level of comprehension of the training. Following the training intervention, a post-test was administered, which had similar questions to the pre-test questionnaire but with a different order of questions.

The questions were developed by the experts from the University of Zambia and the University Teaching Hospital based on the expected competency framework for the training in preceptorship. Piloting of the test items was done among 15 healthcare professionals who were not included in the final analysis. The piloting led to minor modifications in the final test items. The internal consistency was assessed using Cronbach's alpha (> 0.7), indicating a reliable tool for assessing competency in this population.

Statistical analysis

Statistical analysis and data visualisation was done using Stata version 18/BE (Stata Corp., College Station, Texas, USA). Continuous variables were reported as means with standard deviation, and categorical variables as percentages and frequencies. Competency (score of 75% or above) was measured as a proportion with the numerator being the total possible score from the competency framework.

Paired Student t test was used to assess mean differences in scores between pre-test and post-test after the training. Additionally, a repeated measures ANOVA with the Bonferroni multiple comparisons test was used to compare the scores across healthcare cadres and different facilities. A two-tailed P value < 0.05 and 95% confidence intervals were used for all the tests.

Results

Basic characteristics

One hundred and forty-one healthcare workers initiated the training. Overall, 131 attempted pre-test, and 130 attempted post-test assessments. After excluding the participants who did not attempt any assessments, Figure 1 documents the number of participants for the overall analysis. The final analysis included 63 (48.5%) males and 67 (51.5%) females.

The participants included 35(27.3%) Medical officers, 4(3.1%) Medical licentiates, 16(12.5%) Clinical officer general, 19(14.8%) Registered nurse midwife and 54(42.2%) Registered nurses. A larger proportion, 37(27.7%) of healthcare professionals (HCPs) were from Solwezi (Table 1).

Table 1. Basic characteristics of participants

Characteristic	Frequency, n	Percent (%)
Sex		
Female	67	51.5
Male	64	48.5
Health Cadre		
MO	35	27.3
ML	4	3.1
COG	16	12.5
RNM	19	14.8
RN	54	42.2
Training facility		
Kafue	30	23.1
Kabwe	32	24.6
Chipata	32	24.6
Solwezi	37	27.7

MO-medical officer, ML-medical licentiate, COG-clinical officer general, RN-registered nurse, RNM-registered nurse midwife

Pre and post-training scores among healthcare providers

Before the training, Figure 2 shows that the mean score was 73.9% (standard deviation [SD] = 9.9%), which increased to 85.2% (SD=7.5%) after the training. The increase was statistically significant ($p<0.001$). The scores increased significantly in all the assessed health facilities (Figure 3) and among the healthcare cadres except the medical licentiates (Figure 4)

Proportion of participants with competency pre- and post-training

Overall, 69(52.7%) met the threshold (score of 75% or above) for competency before training was initiated, and 120(92.3%) were competent after the training program. Competency was similar between males and females and among the different healthcare cadres pre and post training. On the other hand, competency was different across the training facilities (Table 2).

Table 2. Participants' characteristics and competency on pre-test and post-test

Characteristic	Pre-test		Post-test	
	Fail, n(%)	Pass, n(%)	Fail, n(%)	Pass, n(%)
Overall	62(47.3)	69(52.7)	10(7.7)	120(92.3)
Sex				
Female	28(45.2)	39(56.5)	5(50.0)	62(51.7)
Male	34(54.8)	30(43.5)	5(50.0)	58(48.3)
p-value	0.194		>0.99	
Cadre				
MO	13(21.3)	22(31.9)	2(20.0)	33(27.5)
ML	2(3.3)	2(2.9)	-	4(3.3)
COG	10(16.4)	6(8.7)	1(10.0)	15(12.5)
RNM	10(16.4)	9(13.0)	2(20.0)	17(14.2)
RN	26(42.6)	30(43.5)	5(50.0)	51(42.5)
p-value	0.524		0.923	
Training facility				
Kafue	9(14.5)	21(30.4)	1(10.0)	29(24.2)
Kabwe	15(24.2)	17(24.6)	3(30.0)	29(24.2)
Chipata	14(22.6)	18(26.1)	-	32(26.7)
Solwezi	24(38.7)	13(18.8)	6(60.0)	30(25.0)
p-value	0.040		0.045	

MO-medical officer, ML-medical licentiate, COG-clinical officer general, RN-registered nurse, RNM-registered nurse midwife

Discussion

We aimed to evaluate MDP training intervention among HCPs from selected facilities in Zambia. We noted a significant increase in knowledge scores among the respondents, and this increase was consistent across all the healthcare cadres and health training facilities. Additionally, the proportion of HCPs with competency significantly increased after the training, although this was different across health facilities.

The increase in knowledge among HCPs, following the multidisciplinary preceptorship training noted in this study, is consistent with similar studies [7–9]. The observed increase in knowledge scores after training underscores the importance of the preceptorship training program in enhancing understanding of preceptorship principles, clinical teaching methods, and mentorship skills.

The consistency of improvement across cadres ranging from medical licentiates and clinical officers to registered nurse midwives could also suggest that the training content was appropriately designed and relevant to a multidisciplinary team of healthcare workers [10].

Structured preceptorship and mentorship training programs have previously been shown to improve not only the knowledge of HCPs but also the quality of clinical teaching and supervision of students and other staff members [11–13]. The MDP training used in this study could also explain the observed results, likely through fostered teamwork, mutual learning, and interprofessional collaboration, all of which are critical in a healthcare system [14, 15].

The significant increase in competency scores post-training further demonstrates the program's ability to translate knowledge into practical skills applicable in clinical settings [16]. The MDP model emphasises experiential learning, critical reflection, and supportive supervision, all of which are essential for developing competent and confident HCPs .

The differences in competency levels observed between facilities before and after the training may reflect variations in baseline capacity, institutional culture, and resource availability. Nonetheless, the overall improvement across facilities indicates that the training was adaptable and effective even in differing institutional contexts.

The increase in competency scores also suggests that the training effectively bridged the gap between theoretical understanding and practical application, a common challenge in health worker training [17]. The observed gains are particularly encouraging given the limited availability of structured preceptorship programs in Zambia. They underscore the value of integrating experiential learning, simulation, and supervised practice into preceptor development initiatives. Scaling up the preceptorship training in all the health facilities across the country could strengthen the health workforce's capacity to mentor, teach, and deliver high-quality patient care and clinical training.

Strengths and limitations

To the best of our knowledge, this was the first study to evaluate the training of HCPs in a multidisciplinary approach involving participants from various healthcare cadres, which allowed for a more comprehensive understanding of preceptorship capacity across the health system. Additionally, the use of standardised assessment tools and structured facilitation ensured consistency in content delivery and evaluation. However, the findings of this study should be understood in the context of some limitations. The evaluation was limited to a small group of HCPs from selected training facilities, which may restrict the generalisability of the results to other settings in Zambia. Additionally, the study relied

primarily on pre- and post-test assessments conducted shortly after the training, which may not fully capture long-term retention of knowledge and competencies.

Conclusion

We successfully conducted a pilot of a MDP training program, which showed a significant increase in knowledge and competency. Structured preceptorship programs are effective in improving HCPs' competencies and interprofessional training, which enhance team collaboration and skills transfer. To optimise preceptor skills in clinical training in Zambia and similar settings, it is essential to intensify and sustain the support for local training, with a focus on preceptor skills development in local training hospitals.

Abbreviations

ACEZ

Advancing Vocational Clinical Education in Zambia

COG

Clinical Officer General

HCP

Health Care Professional

MDP

Multidisciplinary preceptors

ML

Medical Licentiate

MO

Medical Officer

RN

Registered Nurse

RNM

Registered Nurse Midwife

UNZA

University of Zambia

VCE

Vocational Centre of Excellence

Declarations

Ethics approval and consent to participate

Consent to participate was not obtained from individual participants, as this was deemed unnecessary. Therefore, a waiver was obtained from the University of Zambia Biomedical Ethics Committee, Reference

number 6220-2024.

This study adhered to the Declaration of Helsinki.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors' contributions

MKL-Conceptualising, supervision, data interpretation, initial draft manuscript writing, revision and proofreading final manuscript, MMK-data interpretation, initial draft manuscript writing, revision and proofreading final manuscript, MKM-initial draft manuscript writing, revision and proofreading final manuscript, WS revision and proofreading final manuscript, JS-revision and proofreading final manuscript, HMS-revision and proofreading final manuscript, BV-revision and proofreading final manuscript, SN-revision and proofreading final manuscript, MC-revision and proofreading final manuscript, MM -, supervision, data interpretation, analysis, initial draft manuscript writing, revision and proofreading final manuscript

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Figures

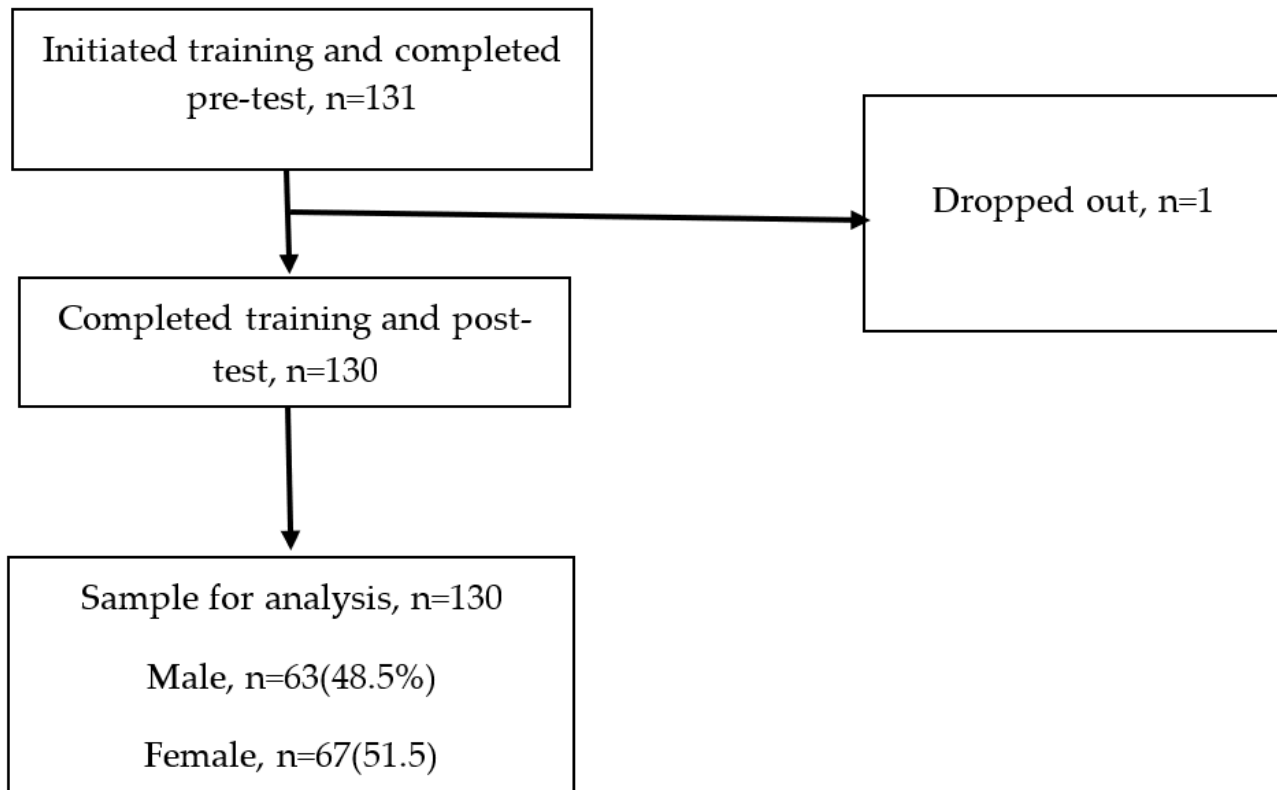


Figure 1

Sample inclusion pre and post-test

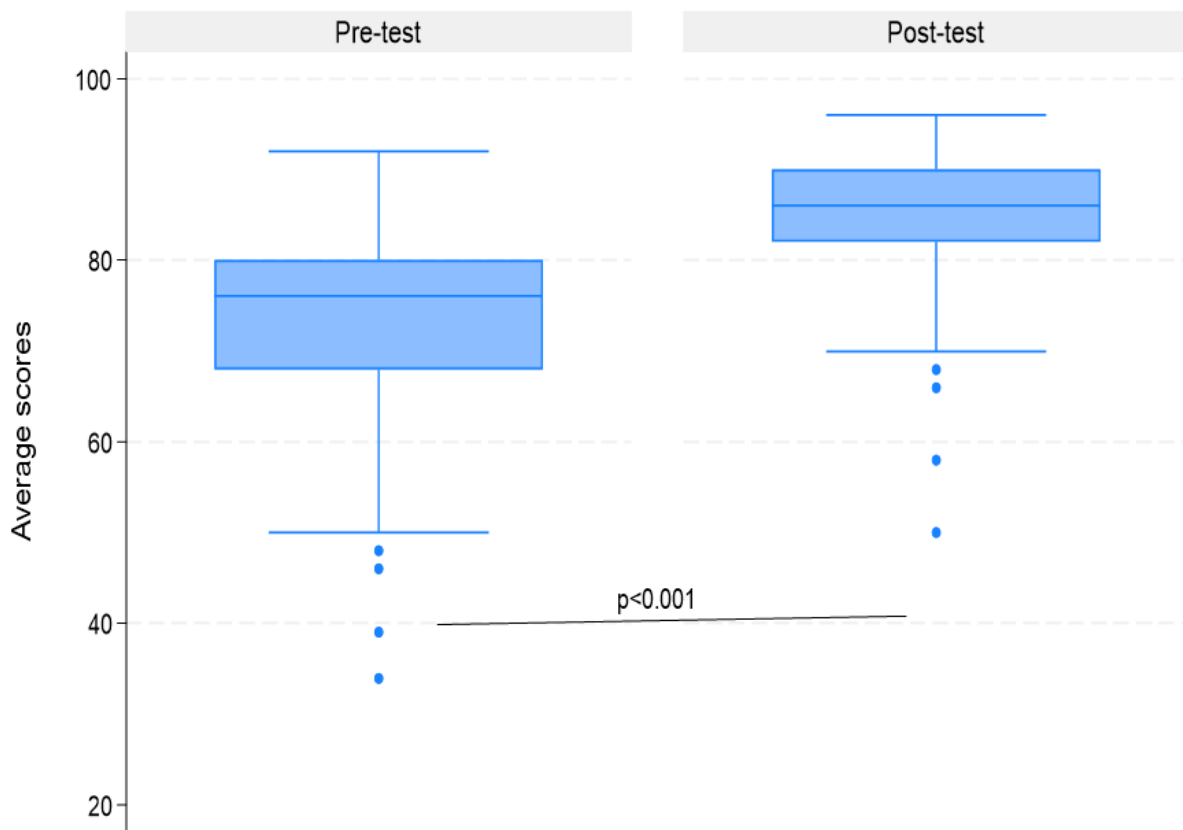


Figure 2

Overall average scores pre-test and post-test. The overall average score pre-test was 73.9%(SD=9.9) and post-test was 85.2% (SD=7.5)

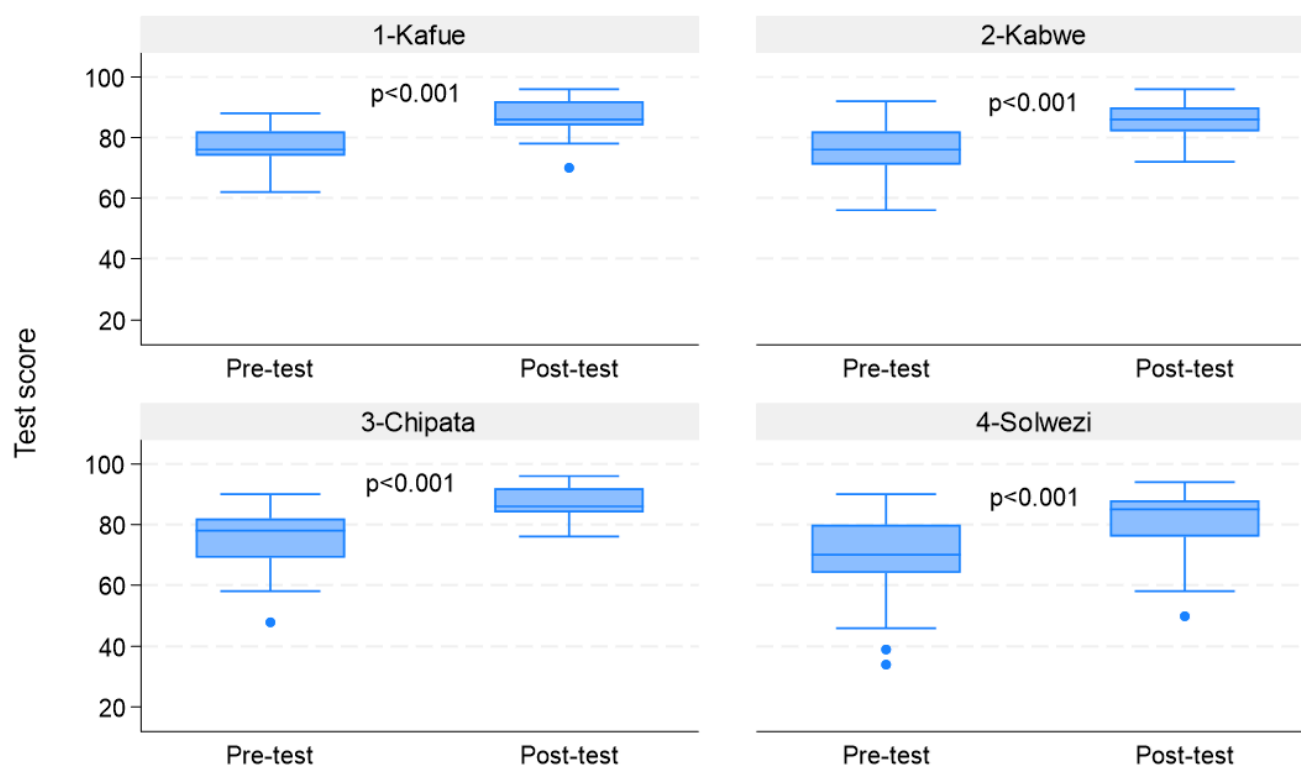


Figure 3

Average scores on pre-test, post-test by facility: SD-standard deviation. Average scores pre/post were: Kafue 76.6%, 86.8% (SD=6.5%, 5.9%), Kabwe 75.4%, 85.4% (SD=8.1%, 6.6%), Chipata 75.2%, 87.3% (SD=9.7%, 5.3%), Solwezi 69.3%, 81.8% (SD=12.4%, 9.7%)

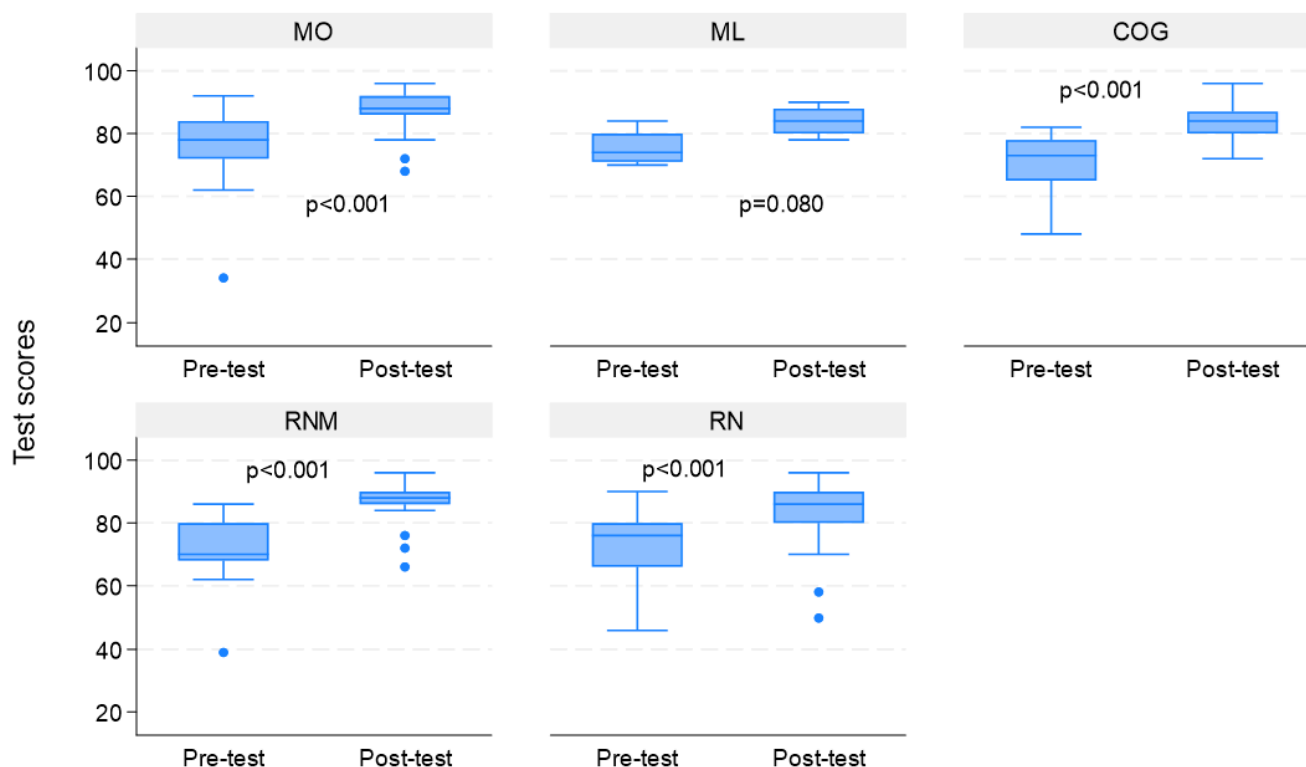


Figure 4

Test scores by health cadre: MO-medical officer, ML-medical licentiate, COG-, RN-registered nurse. Average scores pre/post where; MO, 76.6%, 87.4%(SD=10.4%, 6.1%), ML 75.5%, 84% (SD=6.2%, 5.2%), COG 70.9%, 84.1% (SD=9.2%, 5.8%), RNM 71%, 85.2% (SD=10.2, 8.3), RN 74.0%, 84.3% (SD=9.7%, 8.4%)

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Supplementaryfile103March26MDPTPreandPostTest.pdf](#)