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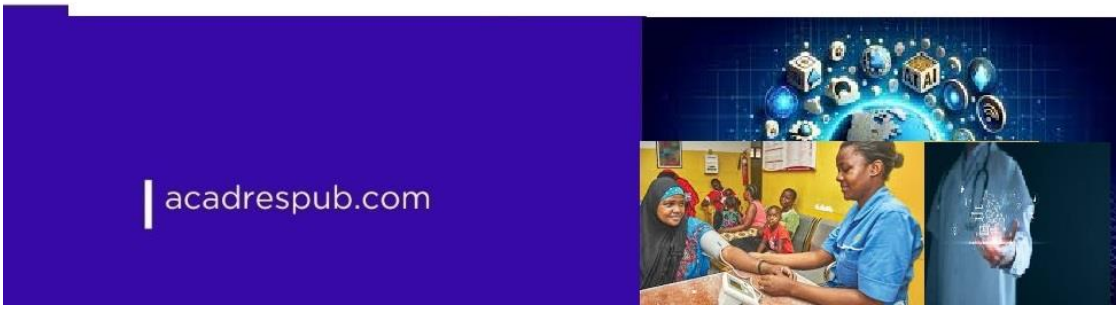

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DETERMINANTS OF PARTICIPATION IN CONTINUTING MEDICAL EDUCATION AMONG HEALTH WORKERS IN SOUTH-SOUTH NIGERIA

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ABSTRACT

Background: Continuing medical education (CME) is essential for maintaining professional competence, particularly in resource-constrained settings. In Nigeria, CME has become mandatory for license renewal; however, participation varies across professional groups and facility types. This study assessed the determinants of CME participation among health workers in South-South Nigeria.

Methods: A descriptive cross-sectional study was conducted among 187 health workers in Ovia North-East Local Government Area, Edo State. Data were collected using a validated, interviewer-administered questionnaire and analyzed with IBM SPSS version 27. Associations between sociodemographic variables and CME participation were tested using chi-square (χ^2) statistics and odds ratios (OR) with 95 % confidence intervals (CI), adopting a significance level of $p < 0.05$.

Results: Overall CME participation was high (92.0 %). Educational qualification (χ^2 = 6.621; p = 0.085), job title (χ^2 = 25.459; p = 0.001), and type of facility (χ^2 = 30.178; p = 0.001) were associated with participation, whereas gender (χ^2 = 1.049; p = 0.306) and years of experience (χ^2 = 5.314; p = 0.257) were not. Workers in government facilities (100 %) and teaching hospitals (93.9 %) reported higher CME use than those in private practice (69.2 %). The frequency of CME attendance varied significantly with occupation (χ^2 = 54.546; $p < 0.001$) and experience (χ^2 = 66.717; $p < 0.001$), with mid-career workers attending more regularly. Hands-on participation was significantly influenced by education (χ^2 = 16.502; $p < 0.001$) and facility type (χ^2 = 10.172; p = 0.038). Major motivators were availability of time (64.7 %) and professional development requirements (64.2 %), while key barriers included time constraints (77.5 %) and lack of funding (72.7 %).

Conclusion: CME participation among health workers in Ovia North-East was generally high but varied by education, job category, and facility type. Addressing barriers through protected training time, institutional funding, and flexible e-learning options will enhance equitable participation and sustain workforce competence in Edo State and beyond.

Keywords: Continuing Medical Education, Professional Development, Health Workers, Determinants, Institutional Funding, Community Medicine

Background

Continuing medical education is a core strategy for keeping the health workforce competent, safe, and responsive to evolving patient needs. Globally, health systems face a projected shortfall of about 11 million health workers by 2030, with the largest gaps in low and lower-middle income countries.[1] In this context, CME and broader continuing professional development help maintain quality where staffing is stretched. Evidence syntheses also show that well-designed continuing education can improve providers' knowledge and skills, especially in underserved settings.[2] Digital delivery has expanded access further, though its impact on patient outcomes still varies by program design and local constraints.[3,4]

Across Africa, workforce shortages and uneven distribution are persistent. Recent regional briefs highlight wide variation in densities of doctors, nurses, midwives, dentists, and pharmacists, with better-resourced countries having many times the workforce of the least resourced.[5,6] These gaps increase the premium on accessible CME models, employer sponsorship, and supportive supervision to retain staff and keep skills current, including through e-learning and blended formats developed during and after COVID-19.[7]

Nigeria illustrates these dynamics. Estimates place Nigeria's skilled health worker density at roughly 1.83 per 1,000 people, below the WHO threshold of 4.45 per 1,000 associated with essential service coverage.[8] In response, national regulators have embedded CME or CPD into licensure. For physicians and dentists, the Medical and Dental Council of Nigeria requires CPD for license renewal, with guidance indicating at least 20 CPD units annually spread across the year.[9] For nurses and midwives, the Nursing and Midwifery Council of Nigeria requires participation in the Mandatory Continuing Professional Development Programme, typically 6 credit units, equivalent to about 60 hours over a three-year cycle, with portions deliverable via accredited providers and platforms.[10]

Within Edo State, service access and workforce strengthening remain priorities, and state agencies emphasize primary health care revitalization and staff upskilling. Local governments rely on mixed cadres across public and private facilities, which makes practical CME delivery factors decisive.[11] These include the availability of accredited courses close to point of care, employer funding or paid study time, internet and power reliability for online modules, managerial support, and clear linkage of CME to career progression. Where these determinants are favorable, participation rises. Where costs, workload, travel, or uneven scheduling prevail, uptake falls, particularly for staff in peripheral facilities.[12]

This study aims to quantify how these drivers and barriers shape CME participation among health workers in Ovia North East, Edo State, Nigeria, to inform local policy and program design.

Methodology

Study Area and Design

This study was conducted in Ovia North-East Local Government Area (LGA) of Edo State, Nigeria, with headquarters in Okada town. The LGA covers about 2,301 km² and had a population of 153,849 in the 2006 census. It hosts major institutions such as the University of Benin and Igbinedion University, Okada, and comprises mainly primary health-care centers with one secondary and one tertiary health facility. A descriptive cross-sectional design was adopted to assess the determinants of continuing medical education (CME) participation among health workers in Ovia North-East.

Study Population and sampling procedure

The target population consisted of health-care professionals who had worked for at least one year in designated public and private health facilities within Ovia North-East LGA. Those unwilling to participate were excluded. The minimum sample size of 187 respondents was determined using the single-proportion formula at a 95 % confidence level, assuming an 87.3 % CME participation rate from a Lagos study and accounting for a 10 % non-response adjustment. A multistage sampling technique was used. Ovia North-East was purposively selected; its 13 wards were clustered, and six were randomly

chosen using computer-generated numbers. All eligible health workers in facilities within the selected wards were recruited until the sample size was reached.

Instrument and Data Collection

Data were obtained through a structured, interviewer-administered questionnaire adapted from validated tools used in Lagos, Enugu, and Ethiopia. The instrument comprised five sections: socio-demographic data, awareness and perception of CME, prevalence and pattern of participation, and determinants or barriers. The questionnaire was reviewed by experts in Community Medicine and pre-tested in two facilities in Ovia South-West LGA to ensure clarity and reliability. Feedback from the pilot informed final adjustments before field use.

Data Processing and Analysis

After collection, the completed questionnaires underwent a thorough screening process to ensure accuracy. Each response was systematically coded before being entered into IBM SPSS Statistics version 27 for further analysis. For the statistical evaluation, descriptive statistics were calculated to present both categorical and continuous data in a clear and concise manner.

To examine potential relationships between variables such as gender, age, marital status, years of experience, and the type of health facility, bivariate analyses were performed using the chi-square (χ^2) test. Where relevant, odds ratios (ORs) along with their 95% confidence intervals (CIs) were derived to measure the strength and direction of these associations.

Ethical Considerations

Ethical clearance was obtained from the Department of Community Health, Igbinedion University Teaching Hospital (Ref: IUTH/R.24/VOL.I/80). Participation was voluntary, informed consent was secured, and confidentiality was maintained through anonymized data entry and secure storage.

Results

CME Participation Among Respondents (Figure 1)

Out of 187 respondents, 172 (92.0%) indicated that they had participated in CME activities, whereas only 15 (8.0%) reported no participation. Relationship between Sociodemographic Characteristics and Use of

Continuing Medical Education (CME) Among Health Workers (Table 1)

Gender, age, marital status, and years of experience were not significantly associated with CME participation ($p > 0.05$). Male respondents (94.5%) had slightly higher participation than females (90.4%), but this difference was not statistically significant ($\chi^2 = 1.049$, $p = 0.306$). Participation was highest among respondents aged 30–39 years (94.3%) and ≥40 years (94.7%), indicating a consistent trend of engagement across age groups.

Educational level showed a marginal association ($\chi^2 = 6.621$, $p = 0.085$), with all respondents holding master's, doctoral, or HND qualifications reporting full participation in CME. Significant associations were observed for job title ($\chi^2 = 25.459$, $p = 0.001$) and type of facility ($\chi^2 = 30.178$, $p = 0.001$). Medical laboratory scientists, administrative staff, community health extension workers, and records officers all reported 100% participation. Likewise, all respondents working in government facilities participated in CME, followed by those in teaching hospitals (93.9%), whereas lower participation was noted in private practice (69.2%) and community health centers (84.0%).

Relationship Between Occupation, Years of Experience, and Frequency of CME Participation (Table 2)
A statistically significant association was observed between job position and CME participation frequency ($\chi^2 = 54.546$, $p < 0.001$). Among physicians, 4 (12.9 %) participated frequently, 12 (38.7 %) occasionally, 12 (38.7 %) rarely, and 3 (9.7 %) never participated. A similar pattern was seen among nurses, with 7 (17.9 %) participating frequently, 14 (35.9 %) occasionally, 14 (35.9 %) rarely, and 4 (10.3 %) never. Pharmacists had 3 (14.3 %) frequent participants, 7 (33.3 %) occasional, 5 (23.8 %) rare, and 6 (28.6 %) who never participated.

Medical laboratory scientists showed the highest level of regular involvement, with 4 (10.0 %) participating frequently, 30 (75.0 %) occasionally, and 6 (15.0 %) rarely, while none reported never participating. Records staff (16 (70.0 %) occasional; 4 (30.0 %) rare) and community health extension workers (8 (66.7 %) occasional; 4 (33.3 %) rare) also reported consistent engagement. In contrast, administrative staff mainly participated rarely (9 (56.3 %)), and community health officers recorded 2 (33.3 %) non-participants.

Years of experience also showed a significant association with CME frequency ($\chi^2 = 66.717$, $p < 0.001$). Among respondents with < 1 year experience, 10 (32.3 %) participated frequently and 10 (32.3 %) occasionally, while 9 (29.0 %) rarely and 2 (6.5 %) never participated. Those with 1–5 years' experience mostly attended occasionally (43 (49.4 %)), while those with 6–10 years were predominantly occasional participants (39 (73.6 %)). Respondents with > 10 years' experience showed higher frequent participation (6 (37.5 %)) and none reported never participating.

Sociodemographic Characteristics and Engagement in Hands-On Participation (Table 3)

Gender was not significantly associated with hands-on participation ($\chi^2 = 0.559$, $p = 0.455$). Male respondents (50 (68.5%)) showed slightly higher engagement compared with females (72 (63.2%)), though this difference was not statistically significant.

With respect to age, participation was similar across groups: 48 (60.8%) of those aged 19–29 years, 44 (62.9%) aged 30–39 years, and 30 (78.9%) aged 40 years and above were actively involved. No significant association was found between age and participation ($p = 0.134$).

Marital status also showed no significant difference ($\chi^2 = 5.588$, $p = 0.348$). Single respondents (71 (64.5%)) and married respondents (34 (65.4%)) participated at comparable rates, while all widowed (8 (100%)) and cohabiting respondents (7 (87.5%)) engaged fully.

A strong and statistically significant association was observed between educational level and hands-on participation ($\chi^2 = 16.502$, $p < 0.001$). Those with master's degrees (40 (85.1%)), doctoral degrees (3 (100%)), and HND qualifications (4 (100%)) had higher engagement than respondents with only bachelor's degrees (75 (56.4%)).

Job title and years of experience were not significantly associated with participation ($p > 0.05$). Nonetheless, records staff (18 (90.0%)), nurses (26 (66.7%)), and community health officers (4 (66.7%)) had relatively higher levels of engagement compared to medical laboratory scientists (24 (60.0%)) and administrative staff (9 (56.2%)).

A significant association was observed for type of facility ($\chi^2 = 10.172$, $p = 0.038$). Health workers in government facilities (28 (82.4%)) and community health centres (18 (72.0%)) were more likely to participate in hands-on training than those in private practice (6 (54.5%)).

Factors Encouraging CME Usage among Respondents (Figure 2)

The most frequently mentioned influences were availability of time (121 respondents; 64.7%) and requirement for professional development (120 respondents; 64.2%). Funding availability was also an important enabler, reported by 107 respondents (57.2%). Fewer participants identified relevance to practice (48 respondents; 25.7%) and organizational support (43 respondents; 23.0%) as key motivators.

Barriers to CME Participation Among Respondents (Figure 3)

The most frequently reported barriers were time constraints (145 respondents; 77.5%) and lack of financial support (136 respondents; 72.7%). Other notable obstacles included limited access to CME programs (82 respondents; 43.9%) and lack of interest (39 respondents; 20.9%).

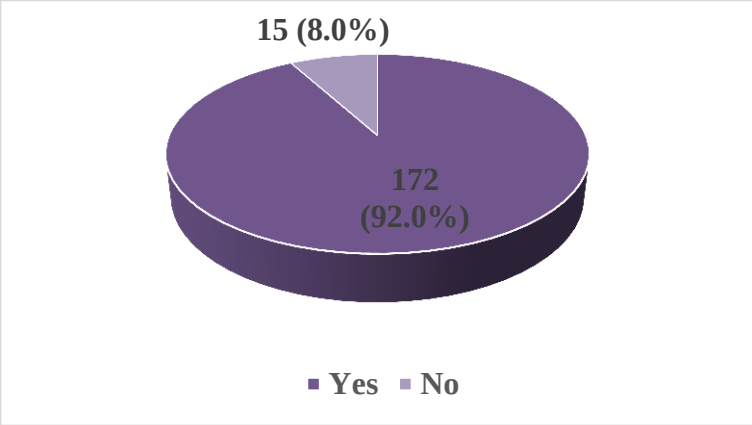

Figure 1: CME Participation among Respondents

Table 1: Sociodemographic characteristics and prevalence of CME participation

Sociodemographics	Use of CME		OR [95%CI]	χ^2	p-value
	Yes n = 172 (%)	No n =15 (%)			
Gender			1.842 [0.564 – 6.021]	1.049	0.306
Male	69 (94.5)	4 (5.5)			
Female	103 (90.4)	11 (9.6)			
Age			—	2.494	0.476
19 – 29	70 (88.6)	9 (11.4)			
30 – 39	66 (94.3)	4 (5.7)			
≥ 40	36 (94.7)	2 (5.3)			
Marital Status			—	5.588	0.348
Single	101 (91.8)	9 (8.2)			
Married	48 (92.3)	4 (7.7)			
Separated/Divorced	7 (71.4)	2 (28.6)			
Widowed	8 (100.0)	0 (0.0)			
Co-habiting	8 (100.0)	0 (0.0)			
Level of Education			—	6.621	0.085
Bachelor's degree	118 (88.7)	15 (11.3)			
Master's degree	47 (100.0)	0 (0.0)			
Doctoral degree	3 (100.0)	0 (0.0)			
Others (HND)	4 (100.0)	0 (0.0)			
Job/Title			—	25.459	0.001
Physician	28 (90.3)	3 (9.7)			
Nurse	35 (89.7)	4 (10.3)			
Pharmacist	15 (71.4)	6 (28.6)			
Medical Lab Scientist	40 (100.0)	0 (0.0)			
Health Assistant	2 (100.0)	0 (0.0)			

Community Health Officer	4 (66.7)	2 (33.3)			
Administrative Staff	16 (100.0)	0 (0.0)			
Community Health Extension Worker	12 (100.0)	0 (0.0)			
Records Staff	20 (100.0)	0 (0.0)			
Years of Experience			—	5.314	0.257
< 1	29 (93.5)	2 (6.5)			
1 – 5	76 (87.4)	11 (12.6)			
6 – 10	51 (96.2)	2 (3.8)			
> 10	16 (100.0)	0 (0.0)			
Type of Facility			—	30.178	0.001
Teaching Hospital	108 (93.9)	7 (6.1)			
Community Center	21 (84.0)	4 (16.0)			
Private Practice	9 (69.2)	4 (30.8)			
Government Facility	34 (100.0)	0 (0.0)			

Table 2: Relationship between occupation, experience and frequency of CME participation

Variable	Frequently n (%)	Occasionally n (%)	Rarely n (%)	Never n (%)	χ^2 (p-value)
Job Position					54.546[b] (<0.001)
Physician	4 (12.9)	12 (38.7)	12 (38.7)	3 (9.7)	
Nurse	7 (17.9)	14 (35.9)	14 (35.9)	4 (10.3)	
Pharmacist	3 (14.3)	7 (33.3)	5 (23.8)	6 (28.6)	
Medical Laboratory Scientist	4 (10.0)	30 (75.0)	6 (15.0)	0 (0.0)	
Health Assistant	0 (0.0)	2 (100.0)	0 (0.0)	0 (0.0)	
Community Health Officer	0 (0.0)	4 (66.7)	0 (0.0)	2 (33.3)	
Administrative Staff	0 (0.0)	7 (43.7)	9 (56.3)	0 (0.0)	
Community Health Extension Worker	0 (0.0)	8 (66.7)	4 (33.3)	0 (0.0)	
Records Staff	0 (0.0)	16 (70.0)	4 (30.0)	0 (0.0)	
Years of Experience					66.717 (<0.001)
<1	10 (32.3)	10 (32.3)	9 (29.0)	2 (6.5)	
1 – 5	0 (0.0)	43 (49.4)	33 (37.9)	11 (12.6)	
6 – 10	2 (3.8)	39 (73.6)	10 (18.9)	2 (3.8)	
>10	6 (37.5)	6 (37.5)	4 (25.0)	0 (0.0)	

b Fischers exact

Table 3: Sociodemographic characteristics and engagement hands-on participation

Variable	Hands-on Participation		OR [95% CI]	χ^2	p-value
	Yes (n=122)	No (n = 65)			
Gender					
Male	50 (68.5)	23 (31.5)	1.268 [0.680 – 2.365]	0.559	0.455
Female	72 (63.2)	42 (36.8)			
Age (years)					
19 – 29	48 (60.8)	31 (39.2)	—	4.023	0.134
30 – 39	44 (62.9)	26 (37.1)			
≥ 40	30 (78.9)	8 (21.1)			
Marital Status			—	5.588	0.348
Single	71 (64.5)	39 (35.5)			
Married	34 (65.4)	18 (34.6)			
Separated/Divorced	2	7			
Widowed	8 (100)	0 (0)			
Co-habiting	7 (87.5)	1 (12.5)			
Level of Education			—	16.502	0.000
Bachelor's degree	75 (56.4)	58 (43.6)			
Master's degree	40 (85.1)	7 (14.9)			
Doctoral degree	3 (100)	0 (0)			
Others (HND)	4 (100)	0 (0)			
Job / Title			—	10.376	0.240
Physician	20 (64.5)	11 (35.5)			
Nurse	26 (66.7)	13 (33.3)			
Pharmacist	13 (61.9)	8 (38.1)			
Medical Laboratory Scientist	24 (60.0)	16 (40.0)			
Health Assistant	0 (0)	2 (100)			
Community Health Officer	4 (66.7)	2 (33.3)			
Administrative Staff	9 (56.2)	7 (43.8)			
Community Health Extension Worker	8 (66.7)	4 (33.3)			
Records Staff	18 (90.0)	2 (10.0)			
Years of Experience			—	8.574	0.073
< 1	17 (54.8)	4 (45.2)			
1 – 5	54 (62.1)	33 (38.9)			
6 – 10	38 (73.6)	14 (26.4)			
>10	12	4			
Type of Facility			—	10.172	0.038
Teaching Hospital	70 (60.9)	45 (39.1)			
Community Health Centre	18 (72.0)	7 (28.0)			
Private Practice	6 (54.5)	7 (45.5)			
Government Facility	28 (82.4)	6 (17.6)			

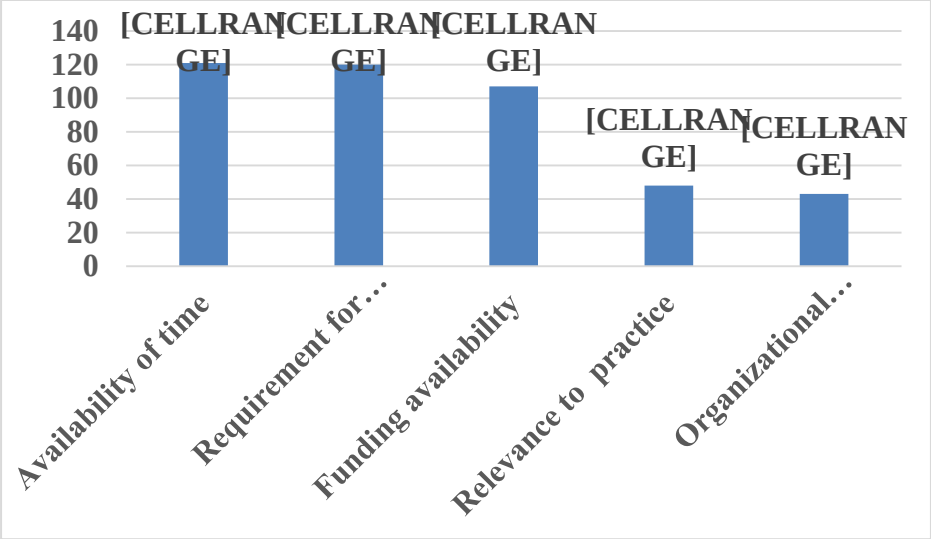

Figure 2: Factors encouraging CME usage among respondents

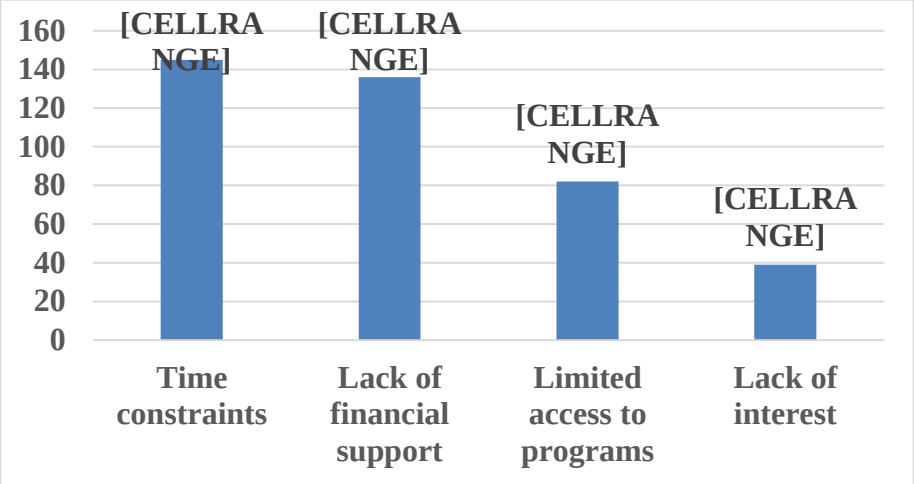

Figure 3: Barriers to CME participation among respondents

Discussion

This study assessed the determinants of continuing medical education (CME) participation among health workers in Ovia North-East, Edo State. The study revealed that almost all respondents had engaged in CME activities. This high level of participation agrees with findings from studies conducted in Bauchi and Lagos, where most health professionals reported similar engagement.[13,14] The likely reason for this consistency is the increasing recognition of CME as a mandatory requirement for license renewal and professional advancement. This is important because consistent CME participation improves clinical competence, promotes evidence-based practice, and enhances patient outcomes. It is recommended that hospitals maintain CME as a structured, continuous component of staff development and link participation to promotion and recertification.

Gender, age, marital status, and years of experience were not significantly associated with CME participation. This finding aligns with

studies in the United States that found equitable access across demographic groups.[15] The possible explanation is that institutional CME opportunities are equally available to all staff categories, regardless of gender or age. This equality is important because it reflects fair access to professional growth. However, flexible CME delivery models such as modular or online sessions are recommended to accommodate younger staff and those with family responsibilities.

Educational level showed a significant relationship with CME participation, as more than two-thirds of respondents with postgraduate or technical qualifications were active participants. This finding is consistent with studies from the United Kingdom where higher educational attainment predicted greater participation in medical education.[16] The likely reason is that those with advanced qualifications have stronger motivation for career advancement and better awareness of CME benefits. The importance of this finding lies in the link between education and lifelong learning behaviour. Institutions should therefore support early-career staff through mentorship and sponsorship for postgraduate or professional training to enhance their commitment to continuous learning.

Job position and facility type were also significantly related to CME participation. Medical laboratory scientists, records staff, and community health workers participated more consistently than administrative or pharmacy staff, while workers in government and teaching hospitals were more active than those in private facilities. This may be due to the presence of organized training schedules and employer funding in public facilities. This finding is important because it shows the effect of institutional influence on professional development. It is recommended that CME accreditation and funding support be extended to private facilities to ensure equal access for all health workers.

The frequency of CME attendance varied with occupation and experience, with mid-career workers participating most regularly and senior professionals more likely to attend specialized training. The likely reason is that these workers are at the stage where professional growth directly impacts promotion and specialization prospects. Regular attendance is crucial because it promotes knowledge retention and sustained competence. Institutional mentorship programs should therefore pair senior and younger staff to encourage consistent participation across all career stages.

Hands-on participation was also high, with about two-thirds of respondents actively involved in practical sessions. Those with higher qualifications and those in government or community facilities had higher engagement, which is similar to findings from China.[17] This may result from better access to structured programs and equipment in public facilities. The importance of this finding is that hands-on CME strengthens procedural competence and confidence in clinical practice. It is recommended that private and lower-tier facilities be integrated into regional CME networks to ensure equitable access to practical training.

The major motivating factors for CME participation were availability of time, need for professional development, and access to funding, while the most reported barriers were time constraints and lack of financial support. These results are consistent with studies from Nigeria, where time availability and professional development were the main motivators of CME participation[18], and Portugal, where heavy workloads and insufficient institutional funding limited participation.[19] The likely reason for these barriers is inadequate staffing and lack of protected learning hours. Addressing these challenges is essential because time and financial constraints directly undermine the continuity of CME. Institutions should allocate protected training periods, improve financial assistance for staff, and adopt hybrid or online CME platforms to overcome these barriers.

Conclusion

This study found that continuing medical education participation among health workers in Ovia North-East was generally high, reflecting strong awareness of its professional value. Educational qualification, job role, and facility type were key determinants, while demographic factors showed minimal influence. This suggests that institutional structure and academic exposure play greater roles in sustaining professional learning than personal attributes.

Persistent challenges such as lack of time and financial support remain important barriers to regular participation. Addressing these through

protected training periods, sponsorship, and flexible online modules will help maintain engagement. Strengthening institutional support for CME is therefore essential for developing a competent and adaptive health workforce capable of improving healthcare delivery across Edo State.

Limitations

The cross-sectional design and reliance on self-reported data limit causal inference and may introduce recall or social desirability bias. Nevertheless, the findings remain valid and provide useful insight into CME participation patterns within the study context.

References

Adam VY, Nwaogwugwu JC. Availability of personnel, facilities and services in Primary Health Care Centres in a Local Government Area in Benin City, Nigeria. *Ann Clin Biomed Res.* 2020;1(1). doi:10.4081/acbr.2020.111

Agwulonu IC, Essien UI, Osuala C, Solomon S. Continued Medical Education for Surgeons: Understanding Participation Trends in Pre-Conference Workshops at Nigerian Orthopedic Association General Meetings. *J Adv Med Med Res.* 2025;37(9):137-144. doi:10.9734/jammr/2025/v37i95934

Alshehri HM, Alshehri AMH, Alshehri AMH, et al. Primary health care professionals' opinions regarding continuing medical education: A cross sectional study. *Medicine (Baltimore).* 2024;103(50):e40865. doi:10.1097/MD.0000000000040865

Asamani JA, Bediakon KSB, Boniol M, et al. State of the health workforce in the WHO African Region: Decade review of progress and opportunities for policy reforms and investments. *BMJ Glob Health.* 2024;7(Suppl 1). doi:10.1136/BMJGH-2024-015952

Boniol M, Kunjumen T, Nair TS, Siyam A, Campbell J, Diallo K. The global health workforce stock and distribution in 2020 and 2030: a threat to equity and "universal" health coverage? *BMJ Glob Health.* 2022;7(6):e009316. doi:10.1136/BMJGH-2022-009316

Enahoro QE, Ogugua JO, Anyanwu EC, Akomolafe O, Odilibe IP, Daraojimba AI. The impact of electronic health records on healthcare delivery and patient outcomes: A review. *World J Adv Res Rev.*2023;21(2):451-460. doi:10.30574/WJARR.2024.21.2.0478

Hashem M, Sfeir E, Hejase HJ, Hejase AJ. Effect of Online Training on Employee Engagement during the COVID-19 Era. *Asian Bus Res.* 2022;7(5):10. doi:10.20849/ABR.V7I5.1294

Jayas A, Andriole DA, Grbic D, Hu X, Dill M, Howley LD. Physicians' continuing medical education activities and satisfaction with their ability to stay current in medical information and practice: A cross-sectional study. *Health Sci Rep.* 2023;6(2):e1110. doi:10.1002/HSR2.1110

Khan R, Khan S, Almohaimeed HM, Almars AI, Pari B. Utilization, challenges, and training needs of digital health technologies: Perspectives from healthcare professionals. *Int J Med Inform.* 2025;197:105833. doi:10.1016/J.IJMEDINF.2025.105833

Lier LM, Breuer C, Dallmeyer S. Organizational-level determinants of participation in workplace health promotion programs: a cross-company study. *BMC Public Health.* 2019;19(1):268. doi:10.1186/s12889-019-6578-7

Medical and Dental Council of Nigeria. *CPD at a Glance* [Internet]. Abuja: Medical and Dental Council of Nigeria; 2011. Available from: https://www.mdcnigeria.org/downloads/cpd-at-a-glance.pdf. Accessed October 31, 2025.

Nursing and Midwifery Council of Nigeria. *Guidelines for Continuing Education Programme for Private Providers* [Internet]. Abuja: Nursing and Midwifery Council of Nigeria; 2010. Available from: https://www.nmcn.gov.ng. Accessed October 31, 2025.

Nwogbe OA, Haliso Y. Continuing Professional Development Assessment of Healthcare Professionals in Public Secondary Hospitals in Lagos State, Nigeria. *Inf Impact J Inf Knowl Manag.* 2020;11(1):26-39. doi:10.4314/iijikm.v11i1.3

Reis T, Faria I, Serra H, Xavier M. Barriers and facilitators to implementing a continuing medical education

intervention in a primary health care setting. *BMC Health Serv Res.* 2022;22(1):638. doi:10.1186/s12913-022-08019-w

Samuel A, Cervero RM, Durning SJ, Maggio LA. Effect of Continuing Professional Development on Health Professionals' Performance and Patient Outcomes: A Scoping Review of Knowledge Syntheses. *Acad Med.* 2021;96(6):913-923. doi:10.1097/ACM.0000000000003899

Sethi A, Schofield S, McAleer S, Ajjawi R. The influence of postgraduate qualifications on educational identity formation of healthcare professionals. *Adv Health Sci Educ Theory Pract.* 2018;23(3):567-585. doi:10.1007/s10459-018-9814-5

Sherman L, Kuang M, Yang DYD, Chappell K. An Overview of Continuing Medical Education/Continuing Professional Development Systems in China: A Mixed Methods Assessment. *J CME.* 2024;13(1). doi:10.1080/28338073.2024.2363855

World Health Organization. Health workforce. Accessed October 31, 2025. https://www.who.int/health-topics/health-workforce#tab=tab_1

World Health Organization. On Health Workforce Migration. Accessed October 31, 2025.