International Journal of Scientific Research Studies

ISSN (print): 3050-6905, ISSN (online): 3050-6913

DOI:10.58806/ijsrs.2026.v3i10n05

Volume 03 Issue 10 October 2026

Page No: 509-516

A Comparative Multivariable Study of Institutional and Workforce Factors Associated with Health Information Management Practices in South-South Nigeria

Kurokeyi, Ebimene. Teddy[1], Pro. Sancho N. Chukwu, PhD[2], Pro. Anthony i. Wegbom[3], Dr. Oduak Peter[4]

[1,4]Department of Public Health Science, Rivers State University, Port Harcourt, Nigeria

[2]Department of Health Information Management, University of Calabar, Calabar, Nigeria

[3]Department of Health Information Management, Bayelsa Medical University, Yenagoa, Nigeria,

[1]ORCID: https://orcid.org/0009-0000-3985-1070

ABSTRACT

Health Information Management (HIM) involves the systematic collection, organisation, analysis and use of health data for clinical care, administration, research and decision making. However, little evidence has shown whether any difference between practices is mainly due to institutional context or workforce factors in Nigeria. This research evaluated institutional and workforce factors associated with HIM practices in South-South Nigeria applying a comparative multivariable analysis. A cross-sectional survey involving 124 HIM professionals was conducted at the University of Benin Teaching Hospital (UBTH), University of Calabar Teaching Hospital (UCTH) and University of Port Harcourt Teaching Hospital (UPTH). Data were obtained using a structured questionnaire on workforce characteristics and four domains of HIM practices; electronic data entry, disease coding and indexing, clinical data analysis and clinical research. Descriptive statistics, chi-square, analysis of variance effect size measures and Hierarchical multiple regression using HC3 robust standard error were used. Age ($p=.013$), work experience ($p<.001$), literacy level ($p=.008$) differed significantly between institutions. However, general HIM practices did not significantly differ by institutional setting ($F=.354$, $p=.702$, $\eta 2=.006$) and practice domains also varied insignificantly between institutions except one domain. Institution explained 0.6% of the variance in the observed practices. Workforce factors contributed to an increase of 17.6% explained variance to 60.7%, and the full model explained 94.4%. Experience, literacy skills, professional title, and certification were still significantly and independently related to HIM practices. The results revealed greater correlation between workforce characteristics and HIM practices rather than between institutional affiliation and HIM practices. emphasis therefore should be placed upon competency-based professional growth, a competent career march, and continual workforce competency evaluations.

KEYWORDS: Creativity; Health Information Management; Practice Performance; Tertiary Hospitals; South-South Nigeria

ARTICLE DETAILS

Published On:
10 October 2026

Available on:
https://ijsrs.org/

1. BACKGROUND

Driven by the unprecedented digital shift in healthcare, the traditional domain of the Health Information Management (HIM) profession has been profoundly redefined from knowledge-based custodians of the medical record to a multidimensional operational and analytical tool (Ahmadi et al., 2022; World Health Organization [WHO], 2026). Where more health systems now depend on integrated EHRs, data governance, real-time analytics, and interoperable IT architecture to facilitate clinical decision-making and performance (Ahmadi et al., 2022; WHO, 2026). Within the transforming IT landscape, complex data environments, unpredictable digital workflows, and emerging information security issues have often pushed standard operating protocols to the limits, requiring human approaches to rise above a solely skill based skill set and complement technical skills with creative problem-solving,

analytical judgment, and creative self-efficacy (Al Wali et al., 2021; Yang et al., 2026). Lacking the presence of intrinsic value and inherent potential to innovate, the human centric creativity capability enables health information workers to bring their baseline digital tools towards better data quality, disease coding, and health delivery performance (Zhu et al., 2026).

From an African perspective, defining the linkage between building HIM service-practitioners' professional ability to diagnose and creatively solve HIM issues and HIM performance takes on added significance as African health systems strive for digital health overall system integration within resource-scarce, infrastructural weak, data fragmented, and digitally unready Health Information System (HIS) environments (Lemma et al., 2020; Sylla et al., 2024; Garchitorena et al., 2026). Digital health interventions tend to underperform in improving health-data quality without capacity strengthening, targeted analytical support, and problem-solving capacity (Lemma et al., 2020). These resource-scarce and evolving embedded health-data environments signal the increased operational importance of HIM service providers' creative improvisation, such as system downtimes, workflow holdups, or operational troubleshooting. So far regional empirical literature focus on complex technical infrastructure, system level maturity, and formal educational activities failing to explore whether individual creative capacity independently influences HIM service performance.

At the national and regional levels in Nigeria, the cumulative consequence of this empirical deficit assumes probative import at the South-South Nigeria institutional domain of tertiary health care where scores of health-related institutions steadily migrate along hybrid states of working capital where legacy manual HIM methods are gradually complimented by burgeoning electronic health applications (Dogiye et al., 2022). Empirical studies at Nigerian tertiary health care institutions confirm that individual workforce characteristics such as computer self-efficacy, data literacy and stewardship predicted the levels of HIM service quality, clinical documentation and APCU (Kurokeyi et al., 2026a; Kurokeyi et al., 2026b) in an electronic data entry, disease indexing and coding, clinical data analysis, and research phase. However, localized empirical studies in the available literature evaluate these HIM workforce characteristics independently thereby offering little empirical insight on creativity as a unique predictor of the core domains of HIM operation-efficiency: electronic data entry, disease indexing and coding, clinical data analysis and research. To bridge this contextual, operational and theoretical deficit, this study predicts the incremental contribution of workplace creativity on HIM practice performance in selected hospitals in South South Nigeria.

2. MATERIALS AND METHODS

Study Design and Setting

A descriptive cross-sectional survey was conducted in three selected tertiary hospitals in South-South Nigeria: University of Port Harcourt Teaching Hospital (UPTH, Rivers State), University of Calabar Teaching Hospital (UCTH, Cross River State), and University of Benin Teaching Hospital (UBTH, Edo State). Participating institutions were selected through a multistage sampling approach.

Population and Sampling

The total study population comprised 206 registered HIM professionals across the three tertiary hospitals (UPTH = 73, UCTH = 74, UBTH = 59). Sample size was calculated using the Taro Yamane formula at a 5% margin of error (**e** = 0.05):

$$\mathbf{n = N / [1 + N(e)^2] = 206 / [1 + 206(0.05)^2] = 135.97 \approx 136}$$

A multistage sampling strategy was utilized: simple random sampling selected the tertiary health institutions, stratified sampling defined institutional strata, and systematic random sampling selected respondents within participating hospital departments.

Study Variables and Instrumentation

Data were gathered using a structured questionnaire adapted from established measurement scales in literature (Gibson et al., 2015; Balkova et al., 2022; Yu et al., 2022). The study focuses on two primary constructs:

5 items considered to affect professional development such as Management support through study leave approval, on the job training through, personal commitment and interest to self-development, Improved remuneration that compensate skills, and competitive workplace championed by skill. While health information management practice were measured within 20 items across four specific domain subscales; Electronic Data Entry Practice (EDP), Disease Coding and Indexing Practice (DCP), Clinical Data Analysis Practice (CDAP), and Clinical Research Practice (CRP), using a 5-point scale ranging from 1 (None) to 5 (Very High).

Psychometric Properties and Data Collection

Content and face validity were verified by academic experts in Health Information Management and Public Health. Instrument reliability was pre-tested on a 20% non-study pilot sample. The overall scales exhibited high internal consistency, with Cronbach's alpha values of 0.925 for Professional Development and 0.973–0.979 across HIM practice subdomains. Data collection was facilitated by six trained research assistants. Out of 136 administered questionnaires, 124 completed and valid copies were retrieved.

Statistical Analysis and Conceptual Model

Data were analyzed using SPSS Version 24. Descriptive statistics were used to summarize categorical institutional and workforce characteristics, while means and standard deviations described overall HIM practices and the four practice domains. Pearson's chi-square test of independence used to assess differences in categorical workforce characteristics across the three institutions, camér's V was reported to quantify the magnitude of institutional associations, One-way analysis of variance (ANOVA), used to compare mean overall HIM practice scores and the four practice domains electronic data entry, disease coding and indexing, clinical data analysis, and clinical research across institutions. Eta-squared (η^2) was reported as the effect-size measure. Bivariate/unadjusted analysis**,** One-way ANOVA was used to examine the unadjusted association between individual institutional/workforce factors and overall HIM practice performance, with η^2 used to quantify the magnitude of each association. Multiple linear regression used to determine workforce factors independently associated with overall HIM practice after simultaneous adjustment for institutional affiliation and other workforce characteristics. Regression coefficients **(B)**, robust standard errors, 95% confidence intervals, and p-values were reported. Hierarchical multiple linear regression: Predictors were entered sequentially in three blocks: Model 1 institution; Model 2 gender**,** age, work experience, and educational qualification; Model 3 recent training, literacy, professional designation, and professional certification. Model performance was evaluated using R^2, adjusted R^2, change in R^2 (ΔR^2), F-change, and associated p-values. Regression diagnostics and robust inference: Model assumptions were assessed using residual normality, heteroscedasticity, multicollinearity, and influential-observation diagnostics. Because heteroscedasticity was identified, HC3 heteroscedasticity-consistent robust standard errors were used for final multivariable inference. Variance inflation factors (VIF), condition indices, and Cook's distance were used to assess multicollinearity and influential observations.

Model 1: $HIMP=B_0+B_1\ INST+ c$

Model 2: $HIMP= B_0+B_1\ INST+B_2\ GEN+ B_3\ AGE+ B_4\ EXP+B_5\ QUAL+ £$

Model 3: $HIMP= B_0+B_1\ INST+B_2\ GEN+ B_3\ AGE+ B_4\ EXP+B_5\ QUAL+ B_6\ TRN+ B_7\ LIT+ B_8\ DES+ B_9\ 9CERT+ £$

The incremental contribution is then:

$\Delta \mathbf{R^2}$Workforce =$\mathbf{R^2}$expanded model-$\mathbf{R^2}$preceding model

Ethical Approval

Ethical approval was granted by the Health Research Ethics Committees of the participating tertiary institutions (Ref: UPTH/HREC/2025/082; UBTH/HREC/2025/019; UCTH/HREC/33/VOL. IV/146). Informed consent was obtained from the participants prior to questionnaire administration.

3. RESULTS

An aggregate of 136 questionnaires were distributed to the study participants (HIM) professionals across the tertiary hospitals, out of which 124 (91.2%) were returned and considered appropriate for analysis.

Table 1. Institutional Distribution of Workforce Characteristics among Health Information Management Professionals

Workforce characteristic	χ^2	df	p	Cramér's V
Gender	2.530	2	.282	.143
Age group	19.426	8	**.013**	.280
Work experience	23.507	6	**<.001**	.308
Educational qualification	5.772	4	.217	.153
Training in previous 12 months	1.840	2	.399	.122
Literacy level	23.769	10	**.008**	.310
Professional designation	7.696	8	.464	.176
Employment status	1.744	4	.783	.084
Professional certification	2.254	4	.689	.095

Table 1 demonstrates that the workforce composition of the participating institutions was heterogeneous for selected characteristics rather than uniformly different across all demographic and professional attributes. Statistically significant institutional differences were observed for age group ($\chi^2 = 19.426$, $p = .013$, Cramér's V = .280), years of work experience ($\chi^2 = 23.507$, $p < .001$, V = .308), and literacy level ($\chi^2 = 23.769$, $p = .008$, V = .310). The corresponding effect sizes indicate moderate institutional variation, with literacy level showing the strongest association with institution, closely followed by work experience and age. These findings suggest that the institutions differed meaningfully in the age, experiential, and literacy composition of their HIM workforce.

In contrast, gender, educational qualification, training within the previous 12 months, professional designation, employment status, and professional certification were not significantly associated with institution ($p > .05$). Their relatively small Cramér's V values further indicate limited institutional differentiation on these characteristics. Therefore, since the two institutions are different in

some aspects of their 'workforces', the fact that there is no difference in that institution in a few work-related characteristics shows a lot of similarity in the general makeup of the HIM workforce.

The pattern has major implications for later comparative analysis. Large differences in age, experience, and literacy suggest that crude institutional comparisons of HIM practices could possibly be capturing differences in workforce composition rather than an institutional effect. The effects of institutional context on HIM practices could therefore be masked by differences in characteristics of the workforce and adjustment for workforce characteristics would be required in the analysis. However, the existence of sparse categories in some characteristics suggests that the results of the pearson χ 2 should be interpreted with caution and sensitivity analysis using exact or Monte Carlo estimates (as appropriate) should be performed.

Table 2. Comparative Health Information Management Practice Performance by Institution

HIM practice outcome	UBTH M (SD)	UCTH M (SD)	UPTH M (SD)	F	p	η^2
Overall, HIM practices	**2.476 (1.135)**	**2.643 (.906)**	**2.625 (.968)**	**.354**	**.702**	**.006**
Electronic data entry	2.191 (1.143)	2.618 (.945)	2.433 (.928)	1.959	.145	.031
Disease coding and indexing	2.405 (1.057)	2.555 (.849)	2.600 (.979)	.465	.629	.008
Clinical data analysis	2.736 (1.250)	2.709 (.957)	2.783 (1.045)	.046	.955	.001
Clinical research	2.573 (1.143)	2.691 (.910)	2.683 (.958)	.183	.833	.003

Table 2 shows no statistically significant difference in overall HIM practice performance across the three institutions, $F(2,121) = .354$, $p = .702$, $\eta^2 = .006$. Mean overall scores were 2.476 for UBTH, 2.643 for UCTH, and 2.625 for UPTH demonstrating only modest descriptive variation. The effect size, too, was quite small. Membership made up about 0.6% of the observed variation in overall HIM practice achievement. From this perspective, the institution category at these levels of analysis did not imply great institutional differences for overall practice. This trend was evident within all four practice domains as well; electronic data entry ($F = 1.959$, $p = .145$, η 2 =.031), disease coding and indexing ($F = .465$, $p = .629$, η 2 =.008), clinical data analysis (F= .046, p =.955, η 2 = .001), and clinical research (F= .183, p =.833, η 2 =.003). Medical data analysis was by far the most consistent, exhibiting nearly no institutionrelated variance.

Overall, the analyses indicate notable institutional comparability in HIM practice outcomes, even though there are workforce composition differences in the institutions as shown in Table 1. This distinction is analytically meaningful: unlike Meleis et al,2 where the institutions were alike in the selected demographics but the differences in the adjusted institutional HIM practice.

Table 3. Unadjusted Associations of Institutional and Workforce Factors with Overall HIM Practices

Factor	F	p	η^2
Institution	.354	.702	.006
Gender	65.066	<.001	.348
Age group	21.176	<.001	.416
Work experience	43.495	<.001	.521
Educational qualification	41.165	<.001	.405
Training in previous 12 months	82.236	<.001	.403
Literacy level	67.380	<.001	.741
Professional designation	151.099	<.001	.835
Employment status	18.470	<.001	.234
Professional certification	145.825	<.001	.707

Table 3 reveals a clear distinction between institutional membership and individual workforce characteristics in their unadjusted associations with overall HIM practices. Institution was not significantly associated with HIM practice performance ($F = .354$, $p = .702$, $\eta^2 = .006$), whereas all examined workforce characteristics showed statistically significant associations ($p < .001$). This finding reinforces the result in Table 2 and indicates that the principal sources of observed variation in HIM practices are more closely related to characteristics of the workforce than to the institution in which respondents' practice. Substantial unadjusted effect sizes were observed for several professional characteristics. Professional designation produced the largest effect ($\eta^2 = .835$), followed by literacy level ($\eta^2 = .741$), professional certification ($\eta^2 = .707$), work experience ($\eta^2 = .521$), age ($\eta^2 = .416$), educational qualification ($\eta^2 = .405$), and recent training ($\eta^2 = .403$). Gender ($\eta^2 = .348$) and employment status ($\eta^2 = .234$) also demonstrated statistically significant between-group differences. The magnitude of these associations suggests that professional positioning, competencies, credentials, and accumulated occupational experience are strongly related to variation in HIM practice scores at the bivariate level.

These estimates, however, represent unadjusted associations and should not be interpreted as independent contributions or causal effects. Several workforce characteristics are conceptually and empirically interconnected; for example, increasing age may correspond with longer experience, higher professional designation, additional certification, and changes in competency profile. The unusually large effect sizes for some variables further reinforce the need to determine whether their associations persist after accounting for covariance among workforce characteristics. Table 3 should therefore be interpreted primarily as identifying the pattern and magnitude of crude associations that warrant evaluation within the adjusted multivariable framework.

Table 4. Multivariable Analysis of Workforce Factors Associated with Overall HIM Practices

Significant adjusted factor/contrast	B	HC3 robust SE	95% CI	p
≥16 vs 1–5 years' experience	.733	.336	[.075, 1.392]	.029
HND/BSc vs OND	−.548	.124	[−.791, −.305]	<.001
Data vs digital literacy	.536	.086	[.367, .705]	<.001
Internet vs digital literacy	.767	.247	[.282, 1.251]	.002
All literacy competencies vs digital literacy	1.080	.353	[.387, 1.772]	.002
None vs digital literacy†	1.249	.369	[.525, 1.973]	.001
CHIMO vs HIMO	.661	.225	[.221, 1.101]	.003
DHIMS vs HIMO	1.364	.499	[.385, 2.343]	.006
RHIT vs RHI-Technician	.736	.205	[.335, 1.137]	<.001

Table 4 identifies the workforce characteristics that retained statistically significant associations with overall HIM practices after simultaneous adjustment for institution and other measured workforce factors. Those with a minimum of 16 years of experience in information management had higher adjusted HIM practice scores than those with 1–5 years of experience (B = .733, 95% CI [.075, 1.392], p =.029). Type of professional position along with the other ranking of professional position was still a factor: compared with HIMOs, CHIMOs (B= .661, 95% CI [.221, 1.101], p =.003) and DHIMSs (B = 1.364, 95% CI [.385, 2.343], p =.006) expressed higher practice scores when adjusted. Similar was true for type of certification they had positive relationship to HIM practice scores compared to RHI-Technicians (B = .736, 95% CI [.335, 1.137], p <.001).

Meanwhile, notable differences persisted on the means adjusted for all the other literacy comparisons at the sub-dimension level as well. Compared to digital-literacy reference group, educational qualification-having data literacy (B =.536, p <.001), internet literacy (B= .767, p = 0.002) and Combined-skill literacy (B = 1.080, p = 0.002)was associated with higher hand interface manipulation mean scores after the adjustment while HND/BSc qualification was negatively associated with hands interface manipulation compared to OND (B= −.548, 95% CI [−.791, −.305], p <.001). However, due to divergence from the crude association, this adjusted coefficient could well reflect statistical suppression or covariance of qualification, experience, designation, certification, and other labor-market variables. It would not imply that increased education is detrimental to HIM practice.

The fully adjusted model explained a very high proportion of variation in HIM practices (R 2 =.944, adjusted R 2 =.930). While these values are quite high and the model is highly explanatory, the model diagnostics should always be taken into account in such models (see above). Large amounts of shared explanatory variance and large amounts of instability in individual coefficients due to the high degree of collinearity among age, experience, qualification, literacy, designation and certification can be the result of large interrelationships among variables like age, experience, qualification, designation, certification and literacy. Further, the positive coefficient assigned to “None” in the literacy variable cannot be logically sound. Nevertheless, themodel does provide support that the nature of the entire work force is associated with the outcome variable, although it cannot support that there are causal relationships and other than collinear professional characteristics, individual coefficients should not be taken at face value.

Table 5. Incremental Contribution of Institutional and Workforce Factors to Overall HIM Practices

Model	Predictor block entered	R^2	Adjusted R^2	ΔR^2	F-change	p-change
Model 1	Institution	.006	−.011	.006	.354	.702
Model 2	+ Gender, age, work experience, qualification	.607	.565	.602	17.012	<.001
Model 3	+ Training, literacy, designation, certification	.944	.930	.336	49.204	<.001

Table 5 offers the most straightforward multivariable evaluation of the cumulative relative explanatory power of institution and workforce variables. Institution explained just 0.6% of the variance in overall HIM practice (R 2 = .006; p = .702) in model 1 and by itself adds little additional informational value in relation to variation in HIM practice performance within the study population. It is also in accordance with the virtually null institution effect sizes across all individual practice domains (Table 2).

Model 2, which introduced gender, age, work experience and educational qualification (eight variables), showed a sharp increase in the amount of variance explained from .006 to .607; the change in R2 was statistically significant at .602 (F-change = 17.012, $p < .001$), demonstrating that these basic characteristics of the work franchise collectively offered significant additional explanatory powers in excess of that of institution. model 3 (which introduced recent training, literacy level, professional job title, professional certification, four variables) registered a significant increase of 33.6 percentage points (were introduced) in the variance explained (.336, F-change=49.204, $p < .001$), reaching a combined final R2 of .944 and adjusted R2 of .930.

The hierarchical pattern therefore provides strong support for the study's central analytical proposition: variation in HIM practices is associated much more strongly with the composition and professional characteristics of the workforce than with institutional membership alone. Importantly, this conclusion concerns the collective explanatory contribution of workforce factors and should not be interpreted as demonstrating that individual workforce characteristics cause differences in HIM practices. Given the cross-sectional design and substantial covariance among professional characteristics, the results establish statistical association rather than temporal or causal relationships. Nevertheless, the substantial incremental contribution of workforce blocks after accounting for institution provides a coherent empirical basis for prioritising workforce characteristics in explaining variation in HIM practices across the study setting.

4. DISCUSSION

The findings demonstrate a notable distinction between institutional differences in workforce composition and institutional variation in Health Information Management (HIM) practices. Age, work experience and literacy differed significantly across institutions, whereas overall HIM practice and its four domains electronic data entry, disease coding and indexing, clinical data analysis and clinical research did not vary significantly by institution. Institution alone accounted for negligible variation in overall HIM practice, suggesting that institutional affiliation may be less influential than the characteristics of the workforce operating within each setting. This finding is consistent with the contemporary Performance of Routine Information System Management (PRISM) perspective, which conceptualises health-information-system performance as arising from interacting organisational, technical and behavioural influences rather than institutional setting alone. Kawakyu et al. (2023), in an integrative review of 45 studies, found that RHIS data use is shaped by multiple interdependent factors and refined PRISM to emphasise the processes linking data activities to informed decisions and actions. Similarly, the Ethiopian Operational Research and Coaching for Analysts study identified organisational, technical, behavioural and process-related influences on RHIS data quality and use, including limited skills and inadequate supportive supervision (Operational Research and Coaching for Analysts [ORCA] Participants & Team et al., 2021). Thus, the present findings extend this evidence by showing that institutions may differ in workforce structure without necessarily demonstrating corresponding differences in HIM practice performance.

The stronger unadjusted associations observed for professional designation, literacy, certification, experience, qualification, training and other workforce characteristics reinforce the importance of professional capacity in HIM practice. After multivariable adjustment, longer work experience, selected literacy competencies, senior professional designation and professional certification remained significantly associated with HIM practice performance. These findings are consistent with Nigerian evidence demonstrating the value of deliberate informatics workforce development. Rachlin et al. (2023), evaluating early implementation of Nigeria's Growing Expertise in E-health Knowledge and Skills (GEEKS) programme, reported that structured mentorship, peer-to-peer learning and subject-matter-expert training provided a framework for developing sustainable informatics capacity and strengthening routine immunisation and surveillance data quality and use. The present results provide complementary individual-level evidence by suggesting that accumulated experience, professional progression, literacy and credentialing are associated with stronger HIM practices. Importantly, however, these characteristics should not be viewed as isolated influences: experience, designation, qualification and certification represent interconnected dimensions of professional development. This interdependence may partly explain why some factors showed large bivariate effects but changed magnitude or direction after simultaneous adjustment.

Literacy-related findings are particularly important given the increasing digitalisation of health-information systems. Data literacy, internet literacy and broader combined literacy competencies retained significant adjusted associations with HIM practice; however, the counterintuitive coefficient for the category coded as having no literacy competency requires caution and should not be interpreted as indicating an advantage of low literacy. The broader evidence points in the opposite direction. In Bayelsa State, Jack-Gbarabe et al. (2026) found high awareness but low operational readiness for cloud-based health-information systems among HIM professionals, with deficiencies in technical competence, ICT infrastructure, structured training and cybersecurity knowledge. Their findings suggest that awareness of emerging technologies does not necessarily translate into the competencies required for effective implementation. Likewise, Ethiopian RHIS evidence showed that knowledge of reporting procedures could coexist with limited practical skills and restricted use of routinely generated information (ORCA Participants & Team et al., 2021). The anomalous literacy coefficient in the present study is therefore more plausibly attributable to coding structure, suppression or multicollinearity among highly related workforce characteristics than to a substantive protective effect of low literacy. This represents an important

methodological gap in existing literature, as workforce attributes are frequently examined separately even though professional competencies, credentials and experience develop concurrently.

The hierarchical analysis provides the clearest synthesis of these findings: institution alone contributed little explanatory information, whereas demographic and career-related workforce characteristics produced a substantial increase in explained variance, followed by a further contribution from training, literacy, professional designation and certification. This supports an interpretation of HIM practice as predominantly associated with the collective workforce capability profile rather than institutional membership per se. The finding aligns with the PRISM-Act framework, which retains behavioural and organisational determinants as interconnected influences on health-information activities and outputs (Kawakyu et al., 2023), and with Nigerian GEEKS experience demonstrating that informatics capacity can be strengthened through sustained mentorship, training and applied professional learning (Rachlin et al., 2023). Nevertheless, the exceptionally high explanatory power of the final model and substantial multicollinearity indicate considerable shared information among the workforce predictors; individual coefficients should therefore not be interpreted as independent causal effects. The study consequently addresses an important gap by simultaneously comparing institutional and workforce-associated factors within a multivariable framework, while highlighting the need for longitudinal, multicentre research using objective HIM performance indicators and multilevel models capable of separating practitioner-level workforce effects from institution-level influences.

5. CONCLUSION AND RECOMMENDATIONS

HIM practices were broadly comparable across the participating institutions despite differences in workforce composition. Institutional affiliation explained minimal variation in HIM practices, whereas workforce characteristics particularly experience, literacy competencies, professional designation, and certification showed stronger associations with practice performance. These findings highlight the importance of workforce capability and professional development in strengthening HIM practice in South-South Nigeria. Given the cross-sectional design and interrelationships among workforce characteristics, the findings should be interpreted as associations rather than causal effects.

In accordance with the findings of the present study the following recommendations are postulated;

1. Healthcare institutions and professional bodies should prioritise competency-based continuing professional development, particularly in data, digital, information, and internet literacy, while reinforcing core HIM competencies.
2. Structured mentorship, certification, competency-based advancement, and targeted training should be strengthened, with interventions tailored to identified differences in workforce experience and literacy rather than relying on uniform institution-wide approaches.
3. Institutions should routinely assess HIM workforce competencies to guide training and workforce development. Future multicentre and longitudinal studies should incorporate objective performance measures and multilevel analyses to distinguish workforce-level from institutional influences on HIM practices.

REFERENCES

1) Ahmadi, M., Sheikhtaheri, A., Tahmasbi, F., Eslami Jahromi, M., & Rangraz Jeddi, F. (2022). A competency framework for Ph.D. programs in health information management. International Journal of Medical Informatics, 168, Article 104906. https://doi.org/10.1016/j.ijmedinf.2022.104906 Cited by: 14
2) Al Wali, J., Al-Nasser, A. D., & Al-Janabi, H. (2021). Unravelling the nexus between creative self-efficacy, humble leadership, and innovative work behavior in healthcare settings. Asia-Pacific Journal of Business Administration, 14(4), 706–724. https://doi.org/10.1108/APJBA-01-2021-0022
3) Balková, M., Lejsková, P., & Ližbetinová, L. (2022). The values supporting the creativity of employees. Frontiers in Psychology, 12, 805153.
4) Dogiye, L. E., Kurokeyi, E. T., & Bakare-Fatungase, O. D. (2022). Application of ICT in health information management practices in selected tertiary hospitals in South-South States of Nigeria. International Journal of Health Records & Information Management, 5(1), 12–24.
5) Garchitorena, A., Ramboarina, S., & Randremanana, R. (2026). Health information system maturity, interoperability, and data quality across Sub-Saharan Africa: Challenges in DHIS2 deployment. African Journal of Health Information Systems, 12(1), 45–58.
6) Gibson, C. J., Abrams, K. J., & Crook, G. F. (2015). Health information management workforce transformation: New roles, new skills and experiences in Canada. Perspectives in Health Information Management, 12(International issue), 1–14.
7) Gidado, S. A., & Bakare-Fatungase, O. D. (2024). Computer self-efficacy, data quality management, and service delivery by HIM professionals in Lagos tertiary hospitals. Lead City International Journal of Library, Information & Communication Sciences, 1(2), 88–101.

8) Jack-Gbarabe, B., Dogiye, L. E., & Idiapho, C. G. N. (2026). Assessment of Health Information Management professionals' readiness for cloud-based health information systems in tertiary hospitals in Bayelsa State. International Journal of Modern Developments in Engineering and Science, 5(5), 10–15. https://doi.org/10.65138/ijmdes.2026.v5i5.306
9) Kawakyu, N., Coe, M., Wagenaar, B. H., Sherr, K., & Gimbel, S. (2023). Refining the Performance of Routine Information System Management (PRISM) framework for data use at the local level: An integrative review. PLOS ONE, 18(6), e0287635. https://doi.org/10.1371/journal.pone.0287635
10) Kurokeyi, E. T., & Bakare-Fatungase, O. D. (2024). Data literacy skills of health information management professionals in tertiary hospitals, Bayelsa State, Nigeria. Lead City International Journal of Library, Information & Communication Sciences, 1(1), 45–56.
11) Kurokeyi, E. T., Dogiye, L. E., & Maclean, R. (2026a). Readiness for cloud-based health information systems among health information management practitioners in South-South Nigeria. Journal of Digital Health & Information Governance, 8(2), 112–125.
12) Kurokeyi, E. T., Maclean, R., & Bakare-Fatungase, O. D. (2026b). Evaluation of health surveillance data management and operational readiness in tertiary healthcare facilities. International Journal of Public Health Information Systems, 14(1), 34–48.
13) Lemma, S., Jiche, B., & Woldemariam, A. (2020). Improving routine health information system data quality and use in Sub-Saharan Africa: A systematic evaluation of integrated capacity-building interventions. BMC Health Services Research, 20(1), Article 512. https://doi.org/10.1186/s12913-020-05345-w
14) Operational Research and Coaching for Analysts (ORCA) Participants & Team, Adane, A., Adege, T. M., Ahmed, M. M., Anteneh, H. A., Ayalew, E. S., Berhanu, D., Berhanu, N., Getnet, M., Bishaw, T., Busza, J., Cherinet, E., Dereje, M., Desta, T. H., Dibabe, A., Firew, H. S., Gebrehiwot, F., Gebreyohannes, E., Gella, Z., et al. (2021). Exploring data quality and use of the routine health information system in Ethiopia: A mixed-methods study. BMJ Open, 11(12), e050356. https://doi.org/10.1136/bmjopen-2021-050356
15) Rachlin, A., Adegoke, O. J., Sikare, E., Adeoye, O. B., Dagoe, E., Adeyelu, A., Tolentino, H., MacGregor, J., Obasi, S., Adah, G., Garba, A. B., Abah, A. U., Friday, J., Oyiri, F., Porter, A. M., Olajide, L., Wilson, I., Usman, R., Usifoh, N., Fasogbon, O., et al. (2023). Lessons learned from early implementation of the Growing Expertise in E-health Knowledge and Skills (GEEKS) program in Nigeria, 2019–2021. Pan African Medical Journal, 46, 81. https://doi.org/10.11604/pamj.2023.46.81.38588
16) Sylla, B., Savadogo, L., & Diallo, G. (2024). Improving health information systems data quality in Sub-Saharan Africa: A systematic review. Sub-Saharan African Journal of Health Informatics, 6(2), 89–104.
17) World Health Organization. (2026). Global strategy on digital health 2020–2026: Regional implementation and health information system maturity assessment in Africa. World Health Organization.
18) Yang, X., Raoush, A., & Zhang, L. (2026). Transformational leadership, creative self-efficacy, and innovative work behavior among healthcare professionals. Cogent Business & Management, 10(3), Article 2265606. https://doi.org/10.1080/23311975.2023.2265606
19) Yu, X., Zhang, C., & Wang, C. (2022). Construction of hospital human resource information management system under the background of artificial intelligence. Computational and Mathematical Methods in Medicine, 2022(1), 8377674.
20) Zhu, Y., Chen, H., & Liu, X. (2026). Organizational support, work engagement, and the translation of individual creativity into clinical practice performance. Journal of Healthcare Management & Innovation, 18(1), 67–82.