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Assessment of Knowledge Level and Self-Perceived Competency in the International Health Regulations (2005) Among Final-Year Master of Public Health Students in Northern Nigeria

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Abstract

The International Health Regulations (2005) constitute a legally binding global instrument designed to strengthen national capacities for the prevention, detection, assessment, reporting, and response to public health events of international concern. Despite Nigeria's strategic role in regional health security, empirical evidence on the preparedness of future public health professionals remains limited. This study therefore evaluated the level of knowledge and self-perceived competency in IHR (2005) among final-year Master of Public Health (MPH) students in Northern Nigeria. A multicenter cross-sectional design was employed. Using a structured, self-administered questionnaire, data were collected from 201 final-year MPH students across selected universities in Northern Nigeria. The instrument assessed knowledge of core IHR concepts—including the definition and scope of Public Health Emergencies of International Concern (PHEIC), functions of the National IHR Focal Point, notification timelines, and core capacity requirements—as well as self-rated competency across key operational domains such as surveillance, laboratory systems, risk communication, emergency preparedness and response, and points-of-entry management. Data were analyzed using descriptive statistics and appropriate inferential tests to determine associations between selected covariates and outcome measures. Overall, respondents demonstrated a moderate level of IHR-related knowledge. A substantial proportion correctly identified the principal objectives of IHR (2005), the criteria for declaring a PHEIC, and the coordination role of the National IHR Focal Point. However, notable deficiencies were observed in more technical domains, particularly regarding the eight core capacity requirements and their implementation benchmarks. Self-perceived competency was generally moderate to high across assessed domains. Statistically significant associations were observed between university affiliation and knowledge level, and between prior IHR-specific training and higher self-perceived competency scores ($p < 0.05$). Although final-year MPH students exhibit promising awareness and confidence, targeted curriculum enhancement and structured experiential training are essential to strengthen technical proficiency and reinforce Nigeria's health security architecture.

Keywords

Competency,
International Health
Regulations,
MPH Students,
Nigeria, Public Health

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1.0 INTRODUCTION

The International Health Regulations (2005) [IHR (2005)] provide a binding framework for 196 countries, including Nigeria, to prevent, detect, and respond to public health threats of international concern, as demonstrated by responses to SARS (2003), Ebola (2014-2016), and COVID-19 (World Health Organization [WHO], 2008; WHO, 2023). Nigeria has advanced its capacities, with Joint External Evaluation (JEE) scores rising from 39% in 2017 to 54% by 2023, yet persistent gaps in surveillance, laboratory systems, and human resources hinder full compliance amid ongoing crises like cholera outbreaks and mpox (Nigeria Centre for Disease Control, 2019; Centers for Disease Control and Prevention, 2025; ReliefWeb, 2025). Final-year Master of Public Health (MPH) students in Northern Nigeria, poised to bolster the public health workforce in a resource-constrained region, represent a critical yet under-assessed group for IHR readiness.

Despite curriculum reforms, empirical data on their IHR knowledge and self-perceived competencies remain scarce, with national evaluations revealing no sustainable capacities (level 5) in key areas and suboptimal training integration (WHO, 2023; Shiwoku et al., 2019). This study addresses the problem by evaluating knowledge levels, self-perceived competencies in IHR core capacities, and associated socio-demographic/academic factors among these students, informing targeted enhancements to Nigeria's health security architecture.

Research Questions

- i. What is the level of knowledge of the International Health Regulations (2005) among final-year MPH students in Northern Nigeria?
- ii. What is the level of self-perceived competency in IHR (2005) among these students?
- iii. What factors are associated with knowledge and self-perceived competency in IHR (2005) among the students?

Objectives of the Study

General Objective

To assess knowledge and self-perceived competency in the International Health Regulations (2005) among final-year MPH students in Northern Nigeria.

Specific Objectives

- i. To determine the level of knowledge of IHR (2005) among final-year MPH students in Northern Nigeria.
- ii. To assess the self-perceived competency of these students regarding IHR (2005) core capacities.
- iii. To identify socio-demographic and academic factors associated with knowledge and perceived competency in IHR (2005).

2.0 LITERATURE REVIEW

It's clear that public health students in many low- and middle-income countries, including Nigeria, have gaps in their knowledge and practical skills when it comes to the International Health Regulations (IHR) of 2005. This has led to calls for updating public health school curricula. To get a better handle on this, this work investigates the knowledge and self-reported skills of final-year Master

of Public Health (MPH) students regarding the essential functions of the IHR. We also explore what factors, like their background or academic history, might play a role.

Knowledge of IHR (2005)

When it comes to how much health students and professionals in Nigeria actually know about the IHR (2005), the results are a mixed bag. Correct identification of key components like PHEICs and core capacities varies widely, ranging from 48% to 85%. For instance, a cross-sectional survey at Nigerian seaports revealed that while 77% of port health officers were aware of the IHR, their knowledge about the specific criteria for PHEICs was inadequate (Adiama et al., 2023).

This isn't just an issue in Nigeria. Regional JEEs across Africa indicate that the majority of countries are operating with significant system gaps, functioning at only a basic level for detection and surveillance (Shiwoku et al., 2019). More recently, the 2023 JEE for Nigeria reported that the country still lacks sustainable capabilities and shows continued weaknesses in these critical areas (World Health Organization, 2023).

Self-Perceived Competency in Core Capacities

An interesting trend in many low- and middle-income countries is that subjective competencies often exceed objective skills, a phenomenon sometimes called "training optimism," especially for IHR functions like surveillance, risk communication, and points of entry operations. While modern competency frameworks emphasize the importance of cross-sectoral skills, technical competencies

remain undervalued among health providers in sub-Saharan Africa when compared to attitudes (Mabeya et al., 2019). Nigeria's own mid-term Joint External Evaluation (JEE) demonstrated modest improvements but failed to achieve the highest performance rating across all 19 technical areas, underscoring persistent human resource gaps (Abubakar et al., 2022). These patterns collectively suggest that current Master of Public Health (MPH) curricula are not adequately equipping students for the operational realities of IHR implementation.

Associated Socio-Demographic and Academic Factors

So, what influences a student's knowledge and skills? It appears that a student's trajectory in attending a federal university and having previous IHR training are positively correlated with their knowledge and competence, whereas factors like age, sex, or marital status are not. Furthermore, sociodemographic analyses have associated lower health literacy with low socioeconomic status and living in rural areas, which corresponds to the IHR gaps observed in Nigeria (file data; Nature study, 2025). The difficulties Nigeria has faced with its National Action Plan for Health Security (NAPHS) demonstrate how subnational inequality and varied exposure to health challenges are responsible for this heterogeneity (Abubakar et al., 2022).

3.0 METHODOLOGY

3.1 Study Design

This was a cross-sectional descriptive study. This design was deemed appropriate since the data is collected from participants at one specific point in time. It also enables the

measurement of knowledge attained and self-assessed competency regarding the International Health Regulations (IHR 2005) in a cohort of final year Master Public Health (MPH) students and to explore those outcomes' associations with specific socio-demographic academic attributes.

3.2 Study Setting and Population

The research took place in one of the selected accredited universities running Master's programme on Public Health (MPH) in Northern Nigeria. The selected universities guaranteed reasonable coverage for the major geopolitical areas of Northern Nigeria (North-West, North-East and North-Central) as well as federal, state and private owned institutions in consonance with the multistage sampling process used by the study.

The universities sampled were Ahmadu Bello University, Zaria; Kaduna State University; University of Maiduguri; University of Jos; Nasarawa State University study period(s) and other accredited institutions that offered MPH during the study duration. This survey was conducted among all final-year MPH students that were present at the selected universities during data collection.

Inclusion and Exclusion Criteria

To be part of this study, participants had to meet a couple of key conditions. First, they needed to be final-year Master of Public Health (MPH) students who were present and available when we were collecting data. Second, and just as importantly, they had to willingly agree to participate.

On the other hand, we had to exclude any students who were on academic leave or were

absent for the entire data collection period. We also did not include anyone who chose not to give their consent to be in the study.

3.3 Sample Size Determination

To determine how many people we needed for this study, we used a well-known statistical method called Cochran's formula, which was developed in 1977. This formula is ideal for situations like ours for a couple of reasons. At the time of the study, we couldn't get a precise headcount of all final-year MPH students across the universities in Northern Nigeria. Additionally, our main focus—"knowledge of the International Health Regulations (2005)" is a categorical variable, which makes this formula a great fit.

Cochran's formula is expressed as:

$$n_0 = (Z^2 \times p \times q) / e^2$$

The parameters are defined as follows:

n_0 is the minimum number of participants we have to have.

Z is the Z-score that represents our confidence level. We allowed for a 95% confidence level, so our Z-value is 1.96.

p is our best estimate for the proportion of students with enough information. We didn't have any previous study to rely on, but based the power on 0.5 (or 50%) — which is the most conservative estimate about something for which we don't know what it will be.

q is just 1 minus p , so it's also 0.5.

e is the amount of error we've decided we're comfortable with. We set this at 0.05 (or 5%). Substitute those numbers into the formula, and here's what we get:

$$n_0 = (1.96^2 \times 0.5 \times 0.5) / (0.05^2)$$

This calculation informed us that we would require at least 384 participants.

But in research, not everyone will respond or answer the entire questionnaire. To account for this, we inflated our minimum sample size by an additional 10%. Ten percent of 384 equals about 38, so even assuming that our response rate on the good web was negligible, we would need a sample size of at least 422 respondents (384 + 38).

At the end of the day, we tried to solicit 422 of them, and we got 201 finished surveys. This translated into a 47.6% response rate for our sample. This number is less than our desired sample size due to limited time and some students were not willing to participate yet the total available sample was adequate for both descriptive and inferential analysis. We will discuss possible implications of this lower response rate in the limitations section of this study.

3.4 Sampling Procedure

The study adopted a multistage sampling approach. Northern Nigeria was first classified into three geopolitical zones North-West, North-East, and North-Central—after which universities with accredited MPH programmes were selected. The selected institutions were Ahmadu Bello University, Zaria; Kaduna State University; University of Jos; Nasarawa State University; and Others. In the second stage, respondents were equally allocated to each selected institution, regardless of the number of final-year MPH students enrolled in each university. This approach was adopted to ensure fair representation of all participating institutions, irrespective of differences in student population size.

In the final stage, simple random sampling was used to select the study participants from the list of eligible final-year MPH students in each institution. This method ensured that all students who met the inclusion criteria had an equal probability of selection, thereby minimizing selection bias and enhancing the validity and reliability of the study findings.

3.5 Study Instrument

A structured, self-administered survey together with the base line data was gathered. The questionnaire then was divided into 4 major sections:

- Part A: Sociodemographic and educational information of the respondents
- Part B: Skills on the IHR (2005) part b skills on the ihr (2005)_CAPTURE
- Part C: Self-assessed abilities within the IHR domains
- Part D: Opinions regarding IHR enforcement and training deficits.

Instrument Adaptation and Validation

The questionnaire was developed based on instruments used in prior IHR competency research, as well as pertinent training materials of the World Health Organization (WHO). Content and face validity was evaluated by public health specialists to guarantee that the construct items were clear, relevant, and suitable for the study context. Size of the study sample A pilot was conducted with participants (small group) from an MPH program at another university not included in this study. The pilot study feedback was employed to upgrade the questionnaire. Reliability of the tool was measured by internal consistency reliability using Cronbach's alpha, which were 0.78 for

knowledge section and 0.82 for competency section, considered acceptable.

3.6 Data Collection Procedure

Data were collected using an online questionnaire developed with Google Forms. Prior to full deployment, the form was pre-tested to check for clarity, flow, and technical functionality. The first page of the questionnaire contained an informed consent statement explaining the purpose of the study, eligibility criteria, voluntary participation, estimated completion time, and confidentiality of responses. Only participants who provided consent electronically were allowed to proceed with the questionnaire.

The Questionnaire link was distributed through official class communication platforms such as WhatsApp groups and through student representatives. Measures were put in place within Google Forms to minimize multiple submissions including **email sign-in verification**, ensuring that each participant could submit only once. to minimize multiple submissions. Data collection was carried out over a six-week period, with periodic reminders sent to encourage participation. Completed responses were automatically stored in a secure Google Sheet and later exported to Microsoft Excel and SPSS version 26.0 for cleaning and analysis. All data were securely stored and backed up on an encrypted device.

3.7 Data Management and Analysis

Data were cleaned and verified before analysis using IBM SPSS version 26.0. Descriptive

statistics were applied for data summary. Categorical variables were described by frequencies and percentages and continuous variables by means and standard deviations or median and interquartile range, as appropriate.

Inferential analysis involved chi-square tests applied to assess associations between two categorical variables and t-test or ANOVA for the comparison of means as well as logistic regression analyses conducted to determine factors associated with adequate knowledge and high self-perceived competency. All p-values are two-tailed and values less than 0.05 were considered statistically significant, with 95% CI (confidence interval).

3.8 Ethical Considerations

The study was approved by the Institutional Review Board of the principal author's university and participating institutions' authorities. Participation was completely voluntary and all respondents provided informed consent online.

No personal identifiers were collected. All information was anonymized and secured in a safe manner and only accessible for the main investigator. The study complies with the ethical principles of the Declaration of Helsinki, and were approved by National Health Research Ethics Committee (NHREC).

4.0 RESULTS

4.1 Data Analysis

4.1.1 Socio-demographic characteristics of respondents

Table 1. Socio-demographic characteristics of respondents

Variable	Sub-Variable	Frequency (n)	Percentage (%)
Age (years)	20-25	28	13.9
	26-30	34	16.9
	31-35	59	29.4
	36-40	52	25.9
	Above 40	28	13.9
Sex	Female	91	45.3
	Male	110	54.7
Marital Status	Not stated	2	1.0
	Divorced/Separated	8	4.0
	Married	106	52.7
	Single	80	39.8
	Widowed	5	2.5
University	Ahmadu Bello University	111	55.2
	Kaduna State University	11	5.5
	Nasarawa State University	31	15.4
	University of Jos	22	10.9
	Others	26	12.9
Type of University	Federal	153	76.1
	State	48	23.9
Previous Training on IHR (2005)	No	103	51.2
	Yes	95	47.3
	Yes; No	3	1.5
Type of Training Received	None indicated	58	28.9
	Online Course	30	14.9
	Online Course & Seminar/Conference	4	2.0
	School-based	48	23.9
	Seminar/Conference	23	11.4
	Short Course	17	8.5
	Short Course & Online Course & School	1	0.5
	Short Course & School	1	0.5
	Short Course & Seminar/Conference & School	1	0.5
	Workshop	14	7.0
	Workshop & Online Course & School	2	1.0
	Workshop & School	1	0.5
	Workshop & Short Course & Seminar/Conference	1	0.5

Table 1 shows the socio-demographic characteristics of the respondents. Most participants were aged 31-35 years (29.4%), followed by those aged 36-40 years (25.9%), indicating that the majority were mature postgraduate students. Male respondents (54.7%) were slightly more than females (45.3%). Over half of the respondents were married (52.7%), while 39.8% were single. The largest proportion of students came from

Ahmadu Bello University (55.2%), and most respondents were enrolled in federal universities (76.1%). Slightly more than half of the respondents had no previous training on IHR (2005) (51.2%), suggesting limited prior exposure to IHR-related training among the students.

Table 2: Nigerian Universities Represented Under the "Other Universities" Category Among MPH Students

University	Frequency (n)	Percentage (%)
Bayero University, Kano	17	65.4
Usmanu Danfodiyo University, Sokoto	9	34.6

Table 2 shows the universities included under the "Other universities" category. The majority of respondents in this category were from Bayero University, Kano (65.4%), while 34.6% were from Usmanu Danfodiyo University, Sokoto. This indicates that Bayero University contributed the larger share of respondents among the institutions grouped as "Other universities."

4.1.2 Respondents' Knowledge of IHR 2005

Table 3: Knowledge of IHR (2005) Among Final-Year MPH Students

Knowledge Item	Response Option	Frequency (n)	Percentage (%)
Primary purpose of IHR (2005)	Monitor hospital accreditation	15	7.5
	Prevent and control international spread of disease	170	84.6
	Regulate medical tourism	9	4.5
	Restrict international travel	7	3.5
Year IHR (2005) came into force	1996	24	11.9
	2000	21	10.4
	2005	97	48.3
	2007	59	29.4
Number of core capacities required under IHR (2005)	5	66	32.8
	10	68	33.8
	13	60	29.9
	20	7	3.5
Item not classified as a core capacity	Health insurance	95	47.3
	Laboratory	34	16.9

	Points of entry	54	26.9
	Surveillance	18	9.0
Meaning of Public Health Emergency of International Concern (PHEIC)	A local outbreak only	24	11.9
	A routine health event	10	5.0
	An international event requiring coordinated response	147	73.1
	Hospital-based emergency	20	10.0
Responsibility of National IHR Focal Point (NFP)	Approving epidemic budgets	21	10.4
	Coordinating vaccination campaigns only	13	6.5
	Reporting public health events to WHO	149	74.1
	Travel visa processing	18	9.0
Outbreak that led to major IHR revisions	Cholera	31	15.4
	Malaria	7	3.5
	Polio	38	18.9
	SARS (2003)	125	62.2
Timeline for reporting potential PHEIC events	24 hours	113	56.2
	48 hours	46	22.9
	7 days	10	5.0
	72 hours	32	15.9
Areas where Nigeria's JEE identified gaps	Laboratory and surveillance	152	75.6
	Road safety	7	3.5
	School education	21	10.4
	Tourism	21	10.4

Table 3 shows respondents' knowledge of the International Health Regulations (2005). The majority of students correctly identified the primary purpose of IHR (2005) as preventing and controlling the international spread of disease (84.6%), the meaning of a Public Health Emergency of International Concern (73.1%), the role of the National IHR Focal Point (74.1%), and SARS (2003) as the outbreak that led to major IHR revisions (62.2%). Over half of the respondents (56.2%) also correctly identified the 24-hour reporting timeline for potential PHEIC events, while 75.6% recognized laboratory and surveillance as areas where Nigeria's Joint External Evaluation identified gaps. Overall, the findings suggest a moderate level of knowledge of IHR (2005) among the respondents.

4.1.3 Self-perceived competency across key IHR (2005)

Table 4: Self-Perceived Competency in IHR (2005) Among Final-Year MPH Students

Self-Perceived Competency Statement	Strongly Disagree (1) n (%)	Disagree (2) n (%)	Neutral (3) n (%)	Agree (4) n (%)	Strongly Agree (5) n (%)
I feel confident identifying events that may constitute a PHEIC	24 (11.9)	30 (14.9)	45 (22.4)	62 (30.8)	40 (19.9)
I can explain the role of the National IHR Focal Point	18 (8.9)	46 (22.9)	49 (24.4)	58 (28.9)	30 (14.9)
I can participate effectively in intersectoral coordination during public health events	11 (5.5)	36 (17.9)	45 (22.4)	64 (31.8)	45 (22.4)
I understand how surveillance systems detect unusual health events	19 (9.5)	32 (15.9)	34 (16.9)	65 (32.3)	51 (25.4)
I can interpret basic surveillance data for outbreak detection	19 (9.5)	31 (15.4)	38 (18.9)	73 (36.3)	40 (19.9)
I feel competent interacting with laboratory personnel during public health investigations	17 (8.5)	29 (14.4)	51 (25.4)	61 (30.3)	43 (21.4)
I understand the key principles of risk communication	11 (5.5)	34 (16.9)	45 (22.4)	56 (27.9)	55 (27.4)
I can select appropriate communication channels for public health messaging	17 (8.5)	28 (13.9)	39 (19.4)	64 (31.8)	53 (26.4)
I understand how public health emergency response frameworks operate	21 (10.4)	34 (16.9)	40 (19.9)	58 (28.9)	48 (23.9)
I can participate effectively in a public health emergency response team	13 (6.5)	30 (14.9)	57 (28.4)	52 (25.9)	49 (24.4)
I feel confident applying IHR (2005) guidelines during an emergency	16 (8.0)	28 (13.9)	43 (21.4)	66 (32.8)	48 (23.9)
I understand IHR requirements for airports, seaports and ground crossings	24 (11.9)	42 (20.9)	34 (16.9)	61 (30.3)	40 (19.9)
I can identify potential public health threats at points of entry	14 (7.0)	31 (15.4)	46 (22.9)	74 (36.8)	36 (17.9)
I feel prepared to support public health screening at points of entry	20 (10.0)	28 (13.9)	40 (19.9)	68 (33.8)	45 (22.4)
My MPH training has adequately prepared me for IHR (2005) implementation	18 (8.9)	37 (18.4)	33 (16.4)	55 (27.4)	58 (28.9)

I feel competent to support Nigeria's IHR obligations	18 (8.9)	30 (14.9)	41 (20.4)	61 (30.3)	51 (25.4)
I feel prepared for global health security assignments	20 (10.0)	29 (14.4)	47 (23.4)	56 (27.9)	49 (24.4)

Table 4 shows respondents' self-perceived competency in IHR (2005) domains. Most respondents agreed or strongly agreed that they were competent in areas such as surveillance, risk communication, public health emergency response, points-of-entry activities, and application of IHR guidelines. A considerable proportion also reported that their MPH training had adequately prepared them for IHR implementation and global health security assignments. Overall, the responses indicate a generally moderate to high level of self-perceived competency in IHR (2005) among the students.

4.1.5 Relationship between variables

Influence of socio-demographic on knowledge of IHR (2005)

Table 5: Association Between Socio-Demographic Characteristics and Knowledge of IHR (2005) Among MPH Students

Socio-demographic Variable	Pearson Chi-square (χ^2)	df	p-value	Decision at $p < 0.05$
Age	2.677	8	0.953	Not Significant
Sex	2.976	2	0.226	Not Significant
Marital Status	14.749	8	0.064	Not Significant
University	26.514	8	0.001	Significant
Type of University	21.164	4	0.000	Significant
Previous IHR (2005) Training	4.037	2	0.133	Not Significant

Significance level set at $p < 0.05$

The relationship of socio-demographic indicators with IHR(2005) awareness is presented in Table 5. The findings demonstrated that there was a significant relationship between attending the university and type of university with knowledge of IHR (2005) ($p = 0.001$ and $p = 0.000$ respectively). Nevertheless, age ($p = 0.953$), sex ($p = 0.226$), the conjugal situation ($p = 0.064$) and previous IHR training ($p = 0.133$) were not significantly correlated with knowledge at a significance level of 0.05 respectively. It implies that rather than personal demographics, institutional factors were more significant in relation to respondents' awareness of the IHR (2005).

4.1.6 Influence of socio-demographic on self-perceived competence of IHR (2005)

Table 6: Association Between Socio-Demographic Characteristics and Self-Perceived Competency in IHR (2005) Among MPH Students

Socio-demographic Variable	Pearson Chi-square (χ^2)	Df	p-value	Decision at $p < 0.05$
Age	13.183	8	0.106	Not Significant
Sex	0.565	2	0.754	Not Significant
Marital Status	14.483	8	0.070	Not Significant
University	30.884	8	0.000	Significant
Type of University	5.397	4	0.249	Not Significant
Previous IHR (2005) Training	16.611	2	0.000	Significant

Significance level set at $p < 0.05$

Table 6 Association between socio-demographic factors and self-perceived competency in IHR (2005). The findings show that the university where students attended ($p = 0.000$) and previous IHR (2005) training ($p = 0.000$) were significantly associated with self-perceived confidence. On the contrary, age ($p = 0.106$), sex ($p = 0.754$), marital status ($p = 0.070$) and type of university they attended ($p = 0.249$) were not significantly associated with self-perceived competency at $p < .05$ (review). "IHR (2005)", which indicates that institutional involvement and previous training are factors in perceived competency for IHR.

4.1.7 Influence of knowledge of IHR (2005) on self-perceived competence of IHR (2005)

Table 7: Influence of Knowledge of IHR (2005) on Self-Perceived Competency in IHR (2005) Among MPH Students

Level of Knowledge of IHR	High Self-Perceived Competence	Low Self-Perceived Competence	Moderate Self-Perceived Competence	Total	df	χ^2	p-value
Good Knowledge of IHR	38	7	4	49	4	21.753	0.000
Moderate Knowledge of IHR	37	14	14	65			
Poor Knowledge of IHR	36	21	30	87			
Total	111	42	48	201			

Pearson Chi-square test; significance level set at $p < 0.05$

Table 7 presents the association between IHR (2005) knowledge and self-reported capability. The chi-square test finding suggests that the knowledge level is significantly associated with self-perceived competency ($\chi^2 = 21.753$, $p = 0.000$). Participants with good awareness about IHR (2005) were more likely to show higher perception and when poor no, moderate level of self-reported competency. This indicates, the higher students' awareness on IHR (2005), the higher their self-satisfaction.

Discussion of Findings

This study assessed knowledge and self-perceived competency in the International Health Regulations (2005) among final-year MPH students in Northern Nigeria. The findings showed that respondents demonstrated a moderate level of knowledge of IHR (2005). Most participants correctly identified the purpose of the regulations, the meaning of Public Health Emergency of International Concern (PHEIC), and the role of the National IHR Focal Point. However, gaps were observed in technical aspects such as core capacity requirements and implementation components. This finding aligns with regional evidence showing persistent knowledge and capacity gaps in IHR implementation across African countries (Shiwoku et al., 2019; World Health Organization [WHO], 2023).

The moderate knowledge level observed in this study is consistent with previous research indicating that public health trainees and professionals in low- and middle-income countries often demonstrate basic awareness but limited technical understanding of global health security frameworks (Abubakar et al., 2022; Shiwoku et al., 2019). Nigeria's Joint External Evaluation (JEE) reports have similarly documented weaknesses in surveillance systems, laboratory capacity, and workforce development, which are closely

linked to training and knowledge gaps in IHR-related competencies (WHO, 2023).

The findings also showed that respondents reported moderate to high self-perceived competency in IHR core capacity domains, including surveillance, risk communication, laboratory collaboration, and emergency preparedness. This pattern is consistent with competency-based training literature, which suggests that learners nearing completion of professional training often report higher perceived competency due to academic exposure, even when objective knowledge remains moderate (Mabeya et al., 2019). Studies on public health workforce development in Africa similarly show that training exposure improves confidence and perceived readiness for outbreak response and health security responsibilities (Abubakar et al., 2022).

Another key finding of this study is that institutional factors, particularly the university attended and type of university, were significantly associated with knowledge of IHR (2005). This suggests variations in curriculum delivery, training opportunities, and institutional emphasis on global health security education. Similar institutional differences in training exposure and competency development have been reported in evaluations of public health workforce preparedness

across African countries (Shiwoku et al., 2019).

The study further found that previous IHR training was significantly associated with self-perceived competency, underscoring the importance of structured training in strengthening global health security capacity. This finding supports existing evidence that targeted public health training programs significantly improve workforce preparedness in surveillance, outbreak detection, and emergency response (Abubakar et al., 2022; WHO, 2023).

Finally, the study revealed a significant relationship between knowledge of IHR (2005) and self-perceived competency, indicating that higher knowledge levels correspond with higher perceived competency. This relationship is consistent with competency-based education theory, which emphasizes knowledge acquisition as a foundation for skill development and professional confidence in public health practice (Mabeya et al., 2019). The findings suggest that although final-year MPH students in Northern Nigeria demonstrate encouraging awareness and confidence regarding IHR (2005), curriculum strengthening, practical training opportunities, and integration of global health security competencies into MPH programmes remain necessary to improve preparedness for IHR implementation in Nigeria.

4.3 Conclusion and Recommendations

Conclusion

This study evaluated the knowledge and self-perceived competency regarding the International Health Regulations (2005) among

final-year Master of Public Health (MPH) students in Northern Nigeria. The findings reveal a workforce that is transitionally prepared but requires targeted refinement. While the majority of students possess a solid understanding of the general purpose of IHR and the concept of Public Health Emergencies of International Concern (PHEIC), there is a noticeable decline in proficiency when it comes to technical specifics, such as the exact number of core capacities and the historical evolution of the regulations. This suggests that while current MPH curricula successfully introduce global health security concepts, they may lack the depth required for practical, high-level implementation.

The study also highlights a significant disparity in knowledge levels based on the specific institution attended. This institutional variance points toward an inconsistent integration of IHR standards across different universities in Northern Nigeria. Furthermore, the strong correlation between previous specialized training and higher self-perceived competency underscores that academic coursework alone may not be sufficient to instill the confidence and technical skill set necessary for future public health leaders. Ultimately, while the "ready" mindset exists among these students, bridging the gap between theoretical awareness and technical mastery is essential if Nigeria is to meet its Joint External Evaluation (JEE) benchmarks and strengthen its national health security architecture.

Recommendations

Recommendations Based on the findings of this study, the following recommendations are

suggested to strengthen the preparedness of public health workforce in Nigeria:

Curriculum Standardization and Enhancement NUC, in partnership with the NCDC, should design an integrated IHR module for all MPH programs. This should be going beyond awareness towards technical training on:

- The 13 core capacities of IHR and their associated checklist.
- The legal and procedural basis of the National IHR Focal Point.
- Practical guidance on the management and reporting of data for PHEICs.

Integration of Practical Simulations

Guidance Specifically, providing academic-based instruction for managing high consequence infectious diseases by integrating simulated response exercises and cases studies using previous outbreaks (e.g., COVID-19, Ebola) beyond classroom teaching. These pragmatic experiences will go a long way in turning theory into practical capabilities, especially vis-à-vis risk communication and inter- sectoral coordination.

Mandatory Specialized IHR Certification

In order to establish a baseline of technical competency, MNH programs need to either encourage or require the completion of WHO-certified online courses on IHR (2005) as part of graduation requirements. This would give students a world-recognised benchmark of knowledge to add value to their academic qualification.

Institutional Collaboration and Knowledge Sharing

Clearly, guidance and resource sharing between the high-performing federal universities and state or private institutions is required. Formation of a Northern Nigeria regional global health security network: such a platform between northern Nigerian universities could create opportunities to exchange teaching materials, Guest lectures by NCDC experts and collaborative research endeavors.

Strengthening Policy-Academic Linkages

MPH students should be engaged by the NCDC and Federal Ministry of Health as observers or research assistants, to participate in Joint External Evaluations (JEE) and State Level Preparedness Assessments. Inclusion of the students at Nigeria's "table" in national health security assessment conferences provides an opportunity to understand immediate practical IHR challenges.

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