

Hygiene Practices in Nigerian Tertiary Institutions: An Assessment of COVID-19 Predictors and Implications

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Publication Date: 2026/09/12

Abstract: Due to COVID-19, much attention was drawn to water, sanitation, and hygiene (WASH) practices in educational institutions around the world. While the emergency period prompted enhanced hygiene compliance, questions remain about the factors that predict sustained hygiene behaviour in the post-pandemic context. This study assessed the predictors of hygiene practices among staff in three federal tertiary institutions in Ogun State, Nigeria: Federal University of Agriculture, Abeokuta (FUNAAB), Federal Polytechnic, Ilaro (FPI), and Federal College of Education, Osiele (FCE). Krejcie and Morgan formula was adopted to determine the sample size of 138. Data collection was done using a cross-sectional survey design on 135 staff members via structured questionnaires and analysed using descriptive statistics and Likert-scale perception indices. The study tested 15 possible predictors, such as awareness of sanitation, poverty, adherence to guidelines, investment in infrastructure, and community involvement. It was found that sanitation awareness was the strongest predictor in all three institutions (Factors of WASH index (FWI) scores of 4.83, 4.38 and 3.68 respectively), then came poverty-related factors (4.15, 3.94, and 4.23) and strict guidelines enforcement (4.04, 3.98, and 4.13). Facility maintenance remained, however, the least significant factor (FWI scores of 1.18, 1.10, and 2.50), indicating a severe lack of association between awareness of institutions about the importance of hygiene and the commitment to the physical infrastructure that underlies it. Hygiene practice outcomes varied across institutions, with FUNAAB and FPI achieving higher mean scores (3.13 and 3.53) than FCE (3.07). The results suggest that successful hygiene promotion in the post-pandemic period should be based on an integrated approach that incorporates both long-term awareness efforts and long-term infrastructure development with regular monitoring for compliance, as well as production of hygiene products and inclusion of hygiene assistance to staff and students welfare.

Keywords: COVID-19, Hygiene Practices, Predictors, Tertiary Institutions, Awareness, Nigeria

How to Cite: Adewunmi, Abiodun Adewale; Fatorisa Odunayo Olawumi; Akinpelu Olusegun Peter; Adelola Opeyemi (2026) Hygiene Practices in Nigerian Tertiary Institutions: An Assessment of COVID-19 Predictors and Implications. *International Journal of Innovative Science and Research Technology*, 11(8), 3506-3513. <https://doi.org/10.38124/ijisrt/26aug1414>

I. INTRODUCTION

Achieving universal access to water, sanitation, and hygiene (WASH) services by 2030, as stipulated under the United Nations Sustainable Development Goals, necessitates significant investments and a concerted effort towards improving WASH infrastructure and hygiene practices (Fagunwa et al., 2025). WASH services are vital to safeguarding public health and well-being, and their importance extends beyond basic disease prevention to encompass socio-economic development, educational

outcomes, and community resilience (Wash, & INDICATORS, 2015; WHO, 2011). Studies have always indicated that nations that have better water supply, sanitation, and personal hygiene tend to have lower mortality rates than those without such facilities (Kelly et al., 2018; Howard et al., 2020).

The global COVID-19 pandemic brought renewed and urgent attention to the role of WASH practices in controlling the spread of infectious diseases. Access to clean water, good hand washing facilities, and proper waste disposal methods were cited as main determinants of preventing COVID-19

spread, which proved a direct relationship between hygiene habits and overall health results (Donde, Atoni, Muia, & Yillia. 2021; Kanyangarara, Allen, Jiwani, & Fuente, 2021). A significant rise in the number of hand washing practices was observed during the pandemic due to several reasons, including increased awareness, fear of infection, and campaigns to promote healthy lifestyles (White, Thorseth, Dreibelbis, & Curtis, 2020). The World Health Organization reiterated that consistent use of hygiene measures, both in medical facilities and in societies, would play crucial roles in preventing person-to-person transmission of diseases (Donde Atoni, Muia, & Yillia. 2021).

In Nigeria, the WASH challenges are particularly pronounced, disproportionately affecting low-income and marginalised groups. A study by Abubakar (2020) has revealed that the availability of sanitation facilities in Nigerian populations is still insufficient, which affects both health and educational outcomes. Emenike et al. (2017) documented the challenges of accessing safe drinking water in southwest Nigeria, while Odibo, Elike, & Sunday (2025) found that the pandemic placed additional strain on already inadequate WASH infrastructure in tertiary institutions.

WASH in education is not merely a health gain, but it has a direct influence on academic performance and attendance. Research has demonstrated that enhanced WASH facilities in schools lead to less disease-related absenteeism, and students have more opportunities to learn steadily (Bowen et al., 2007; Freeman et al., 2014). Tertiary institutions encountered significant issues with insufficient hygiene practices and infrastructure during the COVID-19 pandemic (Olukanni, Iyiola, & Esu, 2021). Moreover, tertiary institutions, as the centres of vital intellectual and professional growth, are often highly vulnerable to gaps in WASH access, awareness, facilities, and practice (WHO & UNICEF, 2015).

Although past research has investigated WASH practices within the education contexts in Nigeria (Olukanni, Iyiola, & Esu, 2021; Otto, Opatoki, & Luyi, 2022; Abubakar, 2020), little focus has been on the systematic identification of factors that predict hygiene behaviours among tertiary institution staff. Knowledge of these predictors is necessary to develop effective interventions that can maintain hygiene gains obtained during COVID-19 and equip institutions for future public health emergencies. This study, therefore, aims to assess the predictors of hygiene practices among staff in federal tertiary institutions in Ogun State, Nigeria; and examine the implications of these predictors for institutional WASH policy and practice.

II. LITERATURE REVIEW

A. Theoretical Framework

There are two theoretical views that conceptually underpin the predictors of hygiene behaviour which are Health Belief Model (HBM) and Social Cognitive Theory (SCT). The HBM conceptualises that the perceived severity of a health threat, vulnerability to the threat, usefulness of the preventive behaviour, and obstacles to the preventive behaviour determine the probability of an individual adopting a health-promoting

behaviour (Rosenstock, 1974; Carpenter, 2010; Glanz, Rimer, & Viswanath, 2015). In the context of WASH practices, the HBM suggests that staff who perceive a greater threat from infectious diseases and who recognise the benefits of proper hygiene are more likely to adopt and maintain protective behaviours. Mbakaya, Kalembo, & Zgambo (2020) discovered that HBM-based interventions, including educational programmes and hand washing facilities, proved to be effective in enhancing hand hygiene behaviours in resource-constrained environments.

The Social Cognitive Theory (SCT) developed by Bandura (1991) focuses on the mutual relationship between the personal factors, environmental factors, and behaviour. SCT argues that people learn through observing other people and that their behaviour is influenced by self-efficacy, expectation of outcomes, self-regulation, social support, observational learning, as well as environmental factors (Bandura, 2011). Motamed-Jahromi and Kaveh (2022) discovered that observational learning was an influential predictor of hand hygiene behaviour in university students, with those who monitored their peers and role models practicing good hygiene behaviours more likely to adhere to those behaviours. The frameworks combined indicate that a multifaceted interaction of individual perceptions and social forces as well as environmental factors determine hygiene practices in tertiary institutions, and these factors may be seen as predictors of behaviour.

B. Empirical Review

On the adequacy and accessibility of WASH facilities in Nigerian tertiary institutions Oloruntoba, Folarin, & Ayede, (2014) found that only 29.4% of university students in Ibadan had access to safe drinking water, while 50.6% had access to improved sanitation facilities. Ejimogu, Okereke, Amadi, & Amadi (2019) assessed WASH facilities in selected tertiary institutions in Imo State and discovered that only 25% had adequate water supply, while 50% had poor sanitation facilities. Uzobo et al. (2024) demonstrated that socio-economic status and gender emerged as influential factors in hygiene behaviours within Nigerian tertiary institutions, with students from higher socio-economic backgrounds showing better access to WASH facilities and better hygiene practices.

The level of hygiene education received has also been identified as a significant factor. Oluwatoyin et al. (2024) found that students with wide education about proper hygiene were more likely to implement this knowledge in their daily lives. Nwajiuba, Ogunji, Uwakwe, & David (2019) emphasised the beneficial effects of the presence of hand washing facilities on hand hygiene habits of university students in Ogun State, indicating that physical infrastructure with continuous education is more effective in producing better behaviour change results.

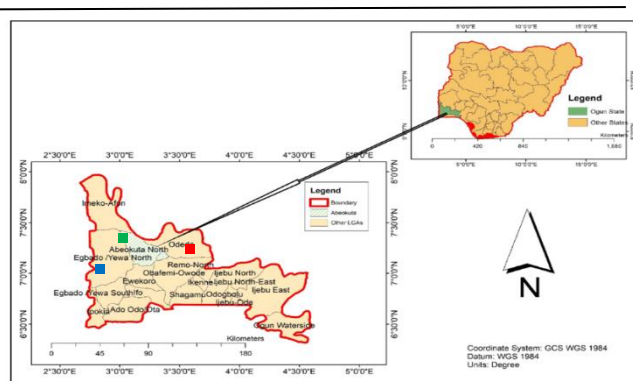
The determinants of hygiene behaviour in schools are complex. Omole, Ndambuki, & Balogun (2015) identified inadequate facilities, poor enforcement of hygiene policies, and cultural beliefs as key barriers to translating hygiene knowledge into practice. Another important predictor is financial constraints, which Abebe, Debela, Zenebe, Hareru, & Ashuro (2023) observed to be a considerable limitation to the

delivery of safe and reliable water supply in universities. Gudi et al. (2020) have indicated that Indian students at universities were poorly aware of hand hygiene practices and knowledge despite accessible facilities, which implies that behaviour change requires awareness and education, which are the inadequate conditions in this case.

The COVID-19 pandemic has further complicated the predictor landscape. Duong, Nguyen, Duong, & Vu (2022) found that perceived susceptibility to COVID-19 was a significant predictor of hand washing behaviour among university students in Vietnam. Zhang, Xu, Lee, & Li (2022) showed that self-regulation was a compelling predictor of hand hygiene behaviour during the pandemic. The post-pandemic environment, however, makes us question the possibility of maintaining the threat-based hygiene gains on the grounds of structural and institutional conditions, rather than the perceived personal risk itself. This paper adds value to this discussion by empirically evaluating the variables that employees at tertiary institutions in Nigeria report to be hygienic predictors, and analysing the relationship between these predictors and the actual outcomes of hygiene practice in various institutional settings.

III. METHODOLOGY

Ogun State is in the extreme south-west of Nigeria. Its location is between 2.5°E and 5°E and 6°N and 8°N. It was established in 1976 and has a total land area of 16,762km² and is bordered by Oyo and Osun States on the north. It is bordered by Ondo State to the east but shares its borders with Lagos State to the south and Republic of Benin to the west as shown in Figure 1. As illustrated in Figure 1, Ogun State consists of 20 Local Government Areas with Abeokuta as its capital.



Note: ■ Federal University of Agriculture Abeokuta
■ Federal Polytechnic, Ilaro
■ Federal College of Education, Osiele

Fig 1: Ogun State Showing Locations of Institutions
Source: Ministry of Physical Planning and Urban Development, Ogun State. (2025)

The research was undertaken in three federal tertiary institutions in south-western Nigeria: Federal University of Agriculture, Abeokuta (FUNAAB), Federal Polytechnic, Ilaro (FPI) and Federal College of Education, Osiele, Abeokuta (FCE). These are the three levels of federal higher education in Nigeria - University, Polytechnic and College of Education.

A. Sampling procedure

The sampling frame comprised staff from all three institutions, with a total staff sample frame of 403. Sample sizes were calculated by using the Krejcie and Morgan (1970) formula adopted by Chuan, & Penyelidikan. is as stated as follows:

$$s = \frac{X^2 NP(1 - P)}{d^2(N - 1) + X^2 P(1 - P)}$$

Where, s = required sample size

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N = the population size

P = is the population proportion (assumed to be .05, since this would provide the maximum sample size)

d = the degree of accuracy express as a proportion (.05)

The calculation resulted in 56, 44, and 38 sample sizes of FUNAAB, FPI and FCE respectively, thereby making 138 respondents in total. The stratified random sampling was adopted on two employment lines: academic and non-academic staff. Staff data was collected via Google form questionnaires by applying convenience sampling. One hundred and thirty-five completed questionnaires were retrieved and used to conduct the analysis.

B. Data collection and Analysis

Two types of structured questionnaires were used to collect data that was inclusive of information about staff socio-economic attributes like gender, age, sex, occupation, income and education among others. Additional data collected are hygiene practices during and following COVID-19, and variables affecting hygiene practices. The questionnaire employed Likert-scale measurements to assess both the perceived factors influencing hygiene practices (rated from 1 = Very Unimportant to 5 = Very Important) and the perceived effectiveness of hygiene practice outcomes (rated from 1 = Strongly Disagree to 5 = Strongly Agree). Descriptive statistics including frequency counts, percentages, and Likert-scale weighted indices were used to analyse the data. Sum of Weighted Values (SWV) method was used to derive composite indices of each of the factors and hygiene practice parameters. To evaluate predictors, a Factors WASH Index (FWI) was calculated on the fifteen predictor variables in the three institutions. For hygiene practice outcomes, a Perception of Hygiene Practice Index (PHPI) was computed across seven practice parameters. Calculations of deviations of institutional means were made to determine high-impact and low-impact factors.

IV. RESULTS OF FINDINGS

A. COVID-19 Predictors of Hygiene Practices

This section presents a comprehensive analysis of the Factors WASH Index (FWI) scores for fifteen predictor variables assessed across the three institutions. The average institutional FWI scores rank the predictors, highest to lowest perceived importance.

The strongest predictor of hygiene practices in all the three institutions was sanitation awareness with FWI scores of 4.83 at FUNAAB, 4.38 at FPI, and 3.68 at FCE. In FUNAAB, 90.9% of respondents rated sanitation awareness as very important, which means that almost all of them understand the importance of awareness in the formation of the hygiene behaviour. This observation is in line with the hypotheses of the Health Belief Model, which focuses on perceived susceptibility and severity as determinants of health behaviour (Rosenstock, 1974), and the Social Cognitive Theory that focuses on the influence of knowledge and outcome expectancy on behavioural decision-making (Bandura, 2011).

The second most influential predictor was poverty, scoring FWI 4.15, 3.94, and 4.23 at FUNAAB, FPI, and FCE respectively. The strong and fairly consistent value placed on poverty in all three institutions is indicative of common acknowledgment among the staff that financial constraints are a major obstacle to proper hygiene habits. Strict enforcement of guidelines was the third best predictor, with scores of 4.04, 3.98, and 4.13 at FUNAAB, FPI, and FCE respectively. The high-level and sustained awareness of this factor by various institutions indicates that employees have a view that regulatory structures and institutional responsibility are

valuable facilitators of hygiene adherence. The FWI scores of hygiene promotional posters were moderate to strong (3.39 to 4.16), with FPI scoring highest. This indicates that visual communication techniques are viewed as powerful, even in institutions where employees might be open to receiving information in easy formats. Infrastructure investment and proper supply of sanitary items scored moderate (2.45-3.50) meaning even though the staff acknowledged the significance of physical infrastructure and material supply, it was not seen as the most significant predictor of hygiene behaviour.

Some factors at the bottom of the predictor hierarchy were rated weakly. Community engagement was also scored very low at FPI (FWI = 1.00), which indicates a low institutional culture of participatory process of WASH management in the said institution. The lowest FWI scores in all three institutions (1.18, 1.10, and 2.50 of FUNAAB, FPI, and FCE respectively) indicate the most consistent area of perceived insignificance. This contradicts the literature in which facility maintenance is many times identified as a condition of maintaining hygiene outcomes (Omole et al., 2015; Emenike et al., 2017). The result of the analysis for the predictors of hygiene practices are revealed in Table 1.

Table 1 Predictors of Hygiene Practices: Factors WASH Index (FWI) Scores by Institution

Predictor Variable	FUNAAB FWI	FPI FWI	FCE FWI	Dev. (F)	Dev. (P)	Dev. (C)
Sanitation awareness	4.83	4.38	3.68	+1.68	+1.69	+0.41
Poverty	4.15	3.94	4.23	+1.01	+1.55	+0.96
Strict enforcement of guidelines	4.04	3.98	4.13	+0.90	+1.26	+0.86
Hygiene promotional posters	3.51	4.16	3.39	+0.37	+0.79	+0.12
Infrastructure investment	3.42	3.07	3.50	+0.28	+0.38	+0.23
Adequate provision of sanitary items	3.42	3.07	2.45	+0.28	+0.38	-0.82
Toilet availability (male/female)	3.02	2.98	3.20	-0.12	+0.29	-0.07
Climate and weather	2.85	2.79	2.82	-0.29	+0.10	-0.45
Socio-economic status	2.83	2.17	3.05	-0.31	-0.52	-0.22
Community engagement	2.76	1.00	2.84	-0.38	-2.29	-0.43
Water supply availability	2.73	2.64	2.57	-0.41	-0.05	-0.70
Knowledge of waterborne diseases	2.64	2.10	4.00	-0.50	-0.59	+0.73
Inadequate knowledge on WASH	2.64	2.19	3.13	-0.50	-0.50	-0.14
Culture and tradition	2.31	1.91	3.52	-0.83	-0.31	+0.25
Well-maintained sanitary unit	1.18	1.10	2.50	-1.96	-1.59	-0.77
Overall Mean	3.14	2.69	3.25			

Source: Field survey, 2026. Note: Dev. = Deviation from institutional mean; F = FUNAAB, P = FPI, C = FCE

B. Assessment of staff Hygiene Practice Outcomes

This section deals with the Perception of Hygiene Practice Index (PHPI) scores on the seven hygiene practice parameters of the three institutions. FPI had the highest mean PHPI score (3.53), then FUNAAB (3.13) and FCE (3.07)

WASH facilities had been rated as the most effective in enhancing hygiene practices in all the three institutions with PHPI scores of 3.98, 4.17 and 3.67 in FUNAAB, FPI, and FCE respectively.

This result supports the significance of physical infrastructure as a requirement to adopt hygiene practices. It aligns with Social Cognitive Theory of environmental influence construct (Bandura, 2011). The positive rating of facility presence across all institutions suggests that where WASH facilities exist, staff recognise their positive influence on hygiene behaviour.

Table 2: Hygiene Practice Outcomes: Perception of Hygiene Practice Index (PHPI) Scores by Institutions

Hygiene Practice Parameter	FUNAAB PHPI	FPI PHPI	FCE PHPI	Dev. (F)	Dev. (P)	Dev. (C)
WASH facility presence impact	3.98	4.17	3.67	+0.85	+0.64	+0.51

Staff positive hygiene behaviour	3.98	3.38	3.35	+0.85	-0.15	+0.19
Hygiene education via posters	3.36	3.86	2.65	+0.23	+0.33	-0.51
WASH materials provision	3.02	3.14	3.62	-0.11	-0.39	+0.46
Staff role modelling	2.78	4.28	3.68	-0.35	+0.75	+0.61
Cleaning/maintenance routine	2.36	3.16	2.35	-0.77	-0.37	-0.81
Infrastructure investment facilitation	2.46	2.71	2.57	-0.67	-0.82	-0.59
Overall Mean	3.13	3.53	3.07			

Source: Field survey, 2026.

The involvement of staff in positive hygiene behaviour was rated highly at FUNAAB (PHPI = 3.98) and moderately at FPI (3.38) and FCE (3.35), reflecting different degrees of personal involvement in facility usage and maintenance. Interestingly, staff role modelling exhibited strong institutional difference: FPI had the best PHPI score (4.28), and FUNAAB had the worst (2.78). This implies that professional culture and leadership relationships regarding hygiene behaviour vary widely across regions of the study.

In addition, the weakest PHPI scores of all institutions were infrastructure investment with a range of 2.46 to 2.71 and cleaning routines with range of 2.35 to 3.16. These results are consistent with the low predictor scores on well-maintained sanitary units in Table 1, and both indicate that there is a systemic issue with institutional commitment to maintain the physical infrastructure and operational systems that strengthen hygiene practices.

C. Discussions of results and implications

These findings reveals a rich and context-dependent image of the predictors of hygiene behaviour in Nigerian federal higher institutions. The stability of the identification of sanitation awareness as the best predictor of all three institutions is in line with predictions of both the Health Belief Model and Social Cognitive Theory, which highlight the importance of knowledge, threat perception, and expectations of an outcome in the determination of health behaviour (Rosenstock, 1974; Bandura, 2011). This is also in line with empirical results by Oluwatoyin et al. (2024), who discovered that hygiene education was a major determinant of practice among students in Lagos, and by Motamed-Jahromi and Kaveh (2022) who also revealed the importance of observational learning in encouraging hand hygiene behaviour among university populations.

The high predictive value of poverty in the three institutions is especially informative to the Nigerian case. The tertiary institutions in Nigeria cater to populations of varying economic abilities and the fact that hygiene results are inherently influenced by economic factors implies that WASH interventions in these facilities cannot be decoupled from the broader socio-economic factors. Similar to Uzobo et al. (2024), who reported a correlation between economic status and hygiene practices in Nigerian tertiary institutions, the current results support such an association through the lens of institutional staff observing the relationship between resource availability and hygiene compliance in their everyday practice. What this means is that successful WASH in Nigerian tertiary institutions might require inclusion of economic assistance component, including subsidised hygiene

products or institutional distribution of basic supplies, in addition to educational interventions.

The emphasis on the strict adherence to the guidelines in all institutions was of high value as it has a direct policy implication. Employees in the three organisations also realised that regulatory frameworks and accountability systems are paramount facilitators of hygiene compliance. This finding echoes the conclusions of Abubakar (2020), who identified the lack of a national policy framework for WASH in tertiary institutions as a significant barrier to effective WASH programme implementation. The resulting outcomes of the uniform identification of enforcement as a predictor indicate that employees are not just aware of the significance of guidelines but also feel that their consistent enforcement is a prerequisite to long-lasting hygiene behaviours. This means that institutional governance frameworks, which include specific WASH oversight frameworks, standards, and performance evaluation frameworks might be defining elements of successful post-pandemic hygiene policies.

The most interesting result is, perhaps, the consistently low significance of well-maintained sanitary units in all three institutions (FWI scores of 1.18, 1.10, and 2.50). This result is paradoxical when viewed in connection with the high awareness of facility presence as a positive impact of hygiene practices (PHPI scores of 3.98, 4.17, and 3.67 in Table 3). Staff are very explicit that the presence of WASH-facilities enhances hygiene behaviour, but do not consider the maintenance of facilities as a significant predictor of practice. This disconnect could be an institutional normalisation of the state of bad maintenance, in which the staff have become accustomed to working in conditions of bad facilities and no longer view maintenance as a factor for change. Alternatively, it can be an indication that maintenance is an institutional obligation that individuals cannot influence, so staff members will minimise it as a personal predictor of individual behaviour. Emenike et al. (2017) reported the decline of the WASH facilities in the tertiary institutions in Nigeria being explained by rampant poor maintenance, and the current results may indicate that its decline reached the level of being no longer seen as a critical determinant of hygiene outcomes.

The differences in the institutional results of hygiene practices (PHPI mean scores of 3.13, 3.53 and 3.07) imply that predictor significance fails to translate homogeneously to practice in various institutional settings. FPI had the best overall score in hygiene practices although it had lower predictor recognition mean score compared to FCE. This can be explained by the fact that role modelling culture is stronger at FPI (PHPI = 4.28 for staff role modelling) and that social and institutional forces mediate the interaction between

predictor recognition and practice results. This result underscores the focus of the Social Cognitive Theory on observational learning and social support as behaviour change mediators (Bandura, 2011; White, Thorseth, Dreibelbis, & Curtis, 2020).

These findings are urgent due to the post-pandemic situation. The fact that the level of hygiene awareness dropped radically across all institutions post-COVID-19, with 55.5% very high awareness during the pandemic and 32.5% low awareness post-pandemic means that the behavioural gains due to threat are always temporary unless reinforced by structure. The identified predictors in this research, especially awareness of sanitation, poverty reduction and implementation of guidelines, are the cornerstones under which post-pandemic hygiene sustainability can be founded. Unless these considerations are made, the hygiene gains obtained during COVID-19 would continue to weaken, exposing institutions to the risk of future public health crises.

V. LIMITATIONS AND FUTURE SCOPE

This study is constrained by the cross-sectional nature of the study that focuses on capturing perceptions of the population at one time and not the relations over a period of time. The use of self-reported data can lead to response bias, and the targeting of federal institutions within one state can affect the external validity of results to other institutional types and geographies. Future studies could use longitudinal designs to monitor how hygiene predictors and practices change over time, with inclusion of observational data of hygiene behaviour as well as self-report data, and scale-up the research to state and private institutions in several states in Nigeria

In spite of these shortcomings, the findings offer empirical evidence, which may be used to design specific WASH interventions in Nigerian tertiary institutions. This study will add to the increasing evidence on post-pandemic WASH management in educational institutions by pinpointing the factors that staff consider most significant in predicting their hygienic behaviour and by showing the gap between predictor recognition and practice outcomes, which can inform policy-makers in institutions, practitioners in the public health sector, and educational administrators.

VI. CONCLUSION

This paper has evaluated hygiene predictors among employees in three federal tertiary institutions in Ogun State, Nigeria and also analysed the implication of the predictors on institutional WASH policy and practice. The results indicate that sanitation awareness, poverty, and strict adherence to guidelines are the best predictors of hygiene practices in the institutions, and facility maintenance is always underrated as a predictor of hygiene behaviour, despite established significance in the literature.

With these in mind the following recommendations drawn from the findings are:

- hygiene promotion after the pandemic in Nigerian tertiary institutions ought to focus on long-term awareness

campaigns not just in the emergency period. The hygiene awareness has decreased dramatically post-COVID-19, suggesting that threat-based, time-constrained communication approaches cannot be effective in long-term behaviour change. WASH education should be incorporated into institutional culture and regular academic curricula by institutions instead of being regarded as a crisis management tool.

- the high predictive value of poverty underscores the necessity of institutional interventions that can help to overcome the economic impediments to hygiene adherence. These might involve institutional supply of hygiene products, the formulation of subsidised supply programmes and incorporation of hygiene assistance into wider staff welfare programmes.
- the recurring acknowledgment of enforcement as a predictor of hygiene practice implies the institutional governance framework ought to encompass dedicated WASH oversight devices, definite facility guidelines, and regular monitoring of performance that facilitate enabling environment for sustained hygiene compliance.

The underestimation of maintenance of facilities as a predictor of hygiene practices is a paradox, and it is both a challenge and an opportunity to institutional leadership. The solution to this lack of connection might involve specific interventions, raising awareness of the links between maintenance quality and hygiene outcomes and obvious institutional investment in facility maintenance as a sign of organisational dedication to WASH. This institutional difference in role modelling performance that is evident in the three institutions presupposes that leadership training and professional development programmes emphasising hygiene behaviour might be especially helpful where the dynamics of social influence are strong.

ACKNOWLEDGMENT

I, A. A. Adewunmi, appreciate the collaborative efforts of O.A. Akinpelu, O. Adelola and O.O. Fatorisa towards the completion of this paper. Each author's contributions and involvement have been substantial and is greatly commended. The manuscript has been meticulously checked and approved by all the authors.

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