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Relationship between Staffing Patterns, Workload, and Burnout among Public Health Nurses in Primary Healthcare Centres in Rivers State

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Abstract

Background: Burnout among nursing professionals is a worldwide issue, especially in low-resource contexts, where primary healthcare (PHC) systems experience chronic staffing shortages and large patient volumes. PHN in Nigeria is the cornerstone of community health services and their psychological well-being is usually undermined by structural forces.
Purpose: The purpose of the study was to explore the relationship between the staffing patterns, workload, and burnout among PHNs in PHC centres in Rivers State, Nigeria.
Methods: A cross-sectional survey, which is descriptive in nature, was carried out on a group of 293 PHNs out of 800 PHNs who were randomly selected. A structured questionnaire with the Workload Assessment Technique (DLR-WAT), NASA Task Load Index (NASA-TLX), and Maslach Burnout Inventory (MBI) was used to collect the data. The data analysis involved the use of descriptive statistics and Pearson Correlation with a significance level of 0.05.
Findings: Adequacy of staffing was slightly adequate (51.19%), and there were notable gaps in peak staffing periods (52.22% insufficient). The level of work was also acutely high, with high physical demand (61.43%) and the constantly present time pressure (54.61%). Burnout was quite high, with 61.43% reporting emotional exhaustion and depersonalisation. There was observed a burnout-engagement paradox, with 59.73% having a strong sense of personal accomplishment despite exhaustion. Inferential analysis determined that there was a strong negative correlation between staffing patterns and burnout ($r = -0.850$, $p < 0.001$) and strong positive correlation between workload and burnout ($r = 0.810$, $p < 0.001$).
Conclusion: Burnout in PHNs in Rivers State is mostly instigated by insufficient staffing and workloads. These are the aspects that pose threats to the sustainability of primary healthcare provision. Policy frameworks with minimum nurse-to-patient ratios and institutional mental health support must be in place to protect the workforce.

How to Cite this Article

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1. Introduction

Nursing workforce burnout has become a worldwide health workforce crisis, especially post-COVID-19. Burnout is characterised by emotional exhaustion, depersonalisation, and a decreased feeling of personal achievement, which not only impact the personal well-being of nurses but also undermines patient safety and the overall quality of healthcare delivery (Mfuru *et al*., 2024). The current literature notes that the global healthcare systems are grappling with an ageing workforce and high turnover rates, and burnout is one of the main contributors to turnover intentions (Usifo & Salawu, 2024). In Sub-Saharan Africa, the lack of resources, excessive disease burdens, as well as a profound lack of infrastructure worsen these issues.

In Nigeria, primary healthcare (PHC) system serves as the initial point of contact to most of the citizens, particularly rural and underserved urban populations. The role of Public Health Nurses (PHNs) in such settings is complex and includes maternal and child health, immunisation, health education, and community outreach. Nevertheless, the Nigerian healthcare system is experiencing a long-standing lack of qualified staff, so-called brain drain phenomenon, when specialists are recruited by more developed economies, seeking more favorable working conditions (Kabunga & Okalo, 2021). The remaining workforce in PHC centres is overworked and under-resourced as a result of this exodus.

Rivers State, which is a great economic hub in Nigeria, is not spared from these systemic pressures. Even with this status, most PHC facilities in the state have reported that they are facing serious problems in ensuring that they have sufficient staffing. Staffing patterns, or how the workforce is allocated and controlled in shifts and locations, are usually not regular and do not reflect the periods of peak demand. In case of insufficiency in staffing, the rest of the nurses will have to absorb the additional workload, which will cause

physical strain and cognitive overload. Recent research in West Africa has pointed out that a mismatch in the numbers of staff and patients is more harmful to staff morale than absolute staff shortages (Health Services Insights, 2022).

A direct result of the staffing patterns is workload, which is the physical and mental effort needed to carry out professional responsibilities in a specific time period. In the case of PHN in Rivers State, workload involves both clinical and administrative duties and community work. Several studies have always attributed high workloads to high error rates, poor job satisfaction, and high levels of stress. According to the Job Demand-Resources (JD-R) model, burnout is the natural consequence of job demands (including high workload) that surpass available resources (including proper staffing and support) (Yang and Gu, 2022).

The connection between these variables is especially acute in the primary healthcare facilities where nurses usually work alone or in small teams with little supervision. Past studies have already identified high nurse-to-patient ratios and excessive working hours with insufficient rest as important predictors of emotional depletion (Kabunga & Okalo, 2021). Nonetheless, localised and current statistics do not exist that specifically target PHNs at Rivers State PHCs. To create evidence-based workforce policies related to burnout in this particular scenario, it is important to understand the subtleties of the interaction between staffing and workload to cause burnout.

This research is thus aimed at addressing this gap by exploring the association between staffing patterns, workload and burnout among PHNs in Rivers State. Through these considerations, the study will give practical recommendations to healthcare administrators and policymakers to enhance their retention of the workforce and service delivery. Burnout is not just an occupational health problem but a central issue to attain Universal Health Coverage (UHC) and the Sustainable Development Goals (SDGs) concerned with health and wellbeing.

2. Methods

2.1 Study Design

A descriptive cross-sectional survey design was used to explore the association between workload and staffing patterns and burnout among Public Health Nurses. The design enabled the data to be collected at one point in time to describe the present condition of the workforce and find correlations between the variables of interest.

2.2 Study Setting

The research was carried out in a selected Primary Healthcare (PHC) centres in Local Government Areas (LGAs) in Rivers State, Nigeria. These centres offer most needed health services, such as maternal and child healthcare, immunisation, and outpatient services to various populations in urban and rural settings.

2.3 Population of the Study

The sample population was made up of the entire 800 Public Health Nurses (PHNs) who were in the PHC facilities of the sampled LGAs in Rivers State.

2.4 Sample Size and Sampling Technique

Sample size was determined using the formula of Taro Yamane which gave a sample size of 293 respondents. To make the sample representative and minimise bias, a simple random sampling method was employed to choose the participants on the list of PHC centres staff.

2.5 Inclusion and Exclusion Criteria

Inclusion Criteria: Registered PHC Nurses working in the selected PHC centres currently and having a minimum of one year of professional experience. Exclusion Criteria: Nurses on long-term leave (maternity or sick leave) or with less than one year experience in their present facility.

2.6 Instrumentation

A self-administered, structured questionnaire was used to gather data. The instrument had four sections:

1. **Socio-Demographic Profile:** Age, gender, years of experience, and facility location.
2. **Staffing Patterns Scale:** A 10-item Likert-type scale assessing perceived adequacy and management of staffing.
3. **Workload Assessment:** Adapted versions of the Workload Assessment Technique (DLR-WAT) and the NASA Task Load Index (NASA-TLX) to measure mental, physical, and time-related demands.
4. **Burnout Inventory:** The Maslach Burnout Inventory (MBI), measuring Emotional Exhaustion, Depersonalisation, and Personal Accomplishment.

2.7 Validity and Reliability

The instrument had a face and content validity test by the experts in the field of public health nursing and measurement/evaluation. The reliability was determined by carrying out a pilot study among 30 PHNs who were not a part of the final sample. Cronbach's alpha coefficient of 0.88 was realized and this shows high internal consistency.

2.8 Data Collection Procedure

The Rivers State Primary Healthcare Management Board and the heads of the chosen PHC facilities were contacted to seek their permission. The researcher and assistants who were trained in administering questionnaires distributed questionnaires. The instruments were administered with one week to respond on participants so as to guarantee high response rate.

2.9 Data Analysis
The data were analysed with the Statistical Package of Social Sciences (SPSS) version 26.0. Demographic data and research questions were summarised through descriptive statistics (frequencies, percentages, means and standard deviations).

2.10 Ethical Considerations
The University of Port Harcourt Research Ethics Committee gave ethical approval. All participants gave informed consent prior to data collection. The anonymity and confidentiality were ensured through the use of codes rather than names and the participants were made aware of their right to drop-out of the process at any point without repercussions.

3. Results
3.1 Socio-Demographic Characteristics
The participants were 293 Public Health Nurses (PHNs). The highest percentage of respondents (34.13) was in the age group of 25-30 years indicating a young workforce (Table 1). The gender balance was almost balanced with females constituting 51.19%. The majority (40.96) of the respondents have 3-5 years of experience, and 59.04 are located in urban PHC facilities.

Table 1: Socio-Demographic Profile of Public Health Nurses (N=293)

Variable	Category	Frequency (f)	Percentage (%)
Age Group	25 – 30 years	100	34.13
	31 – 35 years	80	27.30
	36 – 40 years	60	20.48
	41 years and above	53	18.09
Gender	Female	150	51.19
	Male	143	48.81
Years of Experience	1 – 2 years	100	34.13
	3 – 5 years	120	40.96
	6 years and above	73	24.91
PHC Location	Rural	120	40.96
	Urban	173	59.04

3.2 Staffing Patterns of Public Health Nurses
The adequacy of staffing was also observed to be marginally adequate, with 51.19% consenting that there is an adequate number of personnel to meet the needs of the community. Nevertheless, there were critical gaps found during peak times, with 52.22% indicating inadequate coverage. Moreover, 50.51% believed that the shift scheduling was not effective in reducing overload (Table 2).

Table 2: Staffing Patterns of Public Health Nurses in PHC Facilities (N=293)

S/N	Item Statement	SA	A	D	SD	Agreement (%)	Disagreement (%)
1	The number of PHNs in the facility is adequate for community needs.	50	100	70	73	150 (51.19)	143 (48.81)
2	Shift scheduling reduces work overload.	55	90	60	88	145 (49.49)	148 (50.51)
3	Current staffing helps maintain high-quality care.	65	85	65	78	150 (51.19)	143 (48.81)
4	The facility has enough PHNs for peak times.	45	95	50	103	140 (47.78)	153 (52.22)
5	Overtime is frequently required due to understaffing.*	60	85	60	88	145 (49.49)	148 (50.51)
6	Shift distribution is well-organised and efficient.	75	70	70	78	145 (49.49)	148 (50.51)
7	Clear plan exists for distribution across LGAs.	80	75	60	78	155 (52.90)	138 (47.10)
8	Sufficient PHNs are employed for long-term goals.	70	80	60	83	150 (51.19)	143 (48.81)
9	Staffing pattern reduces the risk of burnout.	60	90	50	93	150 (51.19)	143 (48.81)
10	Balance exists between clinical and admin duties.	50	100	60	83	150 (51.19)	143 (48.81)

**Negatively worded item.*

3.3 Workload Experience of Public Health Nurses
The job was described as being heavy in terms of physical and mental exertion. Physical demands (standing/lifting) were reported by over 61% PHNs with high demands and mental demands were 56.31%. Time pressure was also a major factor, with 54.61% feeling like they were in a hurry to finish everyday work (Table 3).

Table 3: Workload Experience of Public Health Nurses (N=293)

S/N	Workload Dimension	VH	H	M	L	High/VH n (%)	Mod/Low n (%)
1	Mental demand of workload	80	85	60	68	165 (56.31)	128 (43.69)
2	Frequency of mental fatigue/exhaustion	70	80	70	73	150 (51.19)	143 (48.81)
3	Physical demand (walking/standing/lifting)	84	84	60	65	168 (57.34)	125 (42.66)
4	Frequency of physical strain	65	90	60	78	155 (52.90)	138 (47.10)
5	Time pressure to complete daily tasks	75	85	60	73	160 (54.61)	133 (45.39)
6	Feeling rushed/unable to finish on time	65	95	65	68	160 (54.61)	133 (45.39)
7	Success in meeting goals and expectations	85	90	65	53	175 (59.73)	118 (40.27)
8	Satisfaction with work quality	60	85	70	78	145 (49.49)	148 (50.51)
9	Effort exerted to complete daily work	75	95	65	58	170 (58.02)	123 (41.98)
10	Frustration with overwhelming workload	80	85	50	78	165 (56.31)	128 (43.69)

3.4 Burnout Levels among Public Health Nurses

Emotional exhaustion and depersonalisation was high with 61.43% indicating that they felt emotionally drained and 63.14% indicating that they were used up at the end of the day. The depersonalisation was also high (61.43%). Interestingly, the personal accomplishment level was also rather high (59.73 percent) which implied a paradox of burnout-engagement (Table 4).

Table 4: Level of Burnout among Public Health Nurses (N=293)

S/N	Item Statement	Very Often	Often	Sometimes	Never	High Freq (%)	Low Freq (%)
A	**Burnout & Depersonalization (Negative)**						
1	Feel emotionally drained from work.	80	100	65	48	180 (61.43)	113 (38.57)
2	Feel used up at the end of the day.	75	110	60	48	185 (63.14)	108 (36.86)
3	Fatigued when waking up for work.	85	95	75	38	180 (61.43)	113 (38.57)
4	Treating patients as impersonal objects.	90	90	70	43	180 (61.43)	113 (38.57)
5	Becoming more callous toward people.	95	85	70	43	180 (61.43)	113 (38.57)
6	Not really caring what happens to patients.	85	85	65	58	170 (58.02)	123 (41.98)
B	**Personal Accomplishment (Positive)**						
7	Positively influencing lives of others.	80	95	65	53	175 (59.73)	118 (40.27)
8	Proud of the work I do.	70	100	75	48	170 (58.02)	123 (41.98)
9	Accomplishing worthwhile things.	80	90	75	48	170 (58.02)	123 (41.98)
10	Making a significant difference.	85	95	60	53	180 (61.43)	113 (38.57)

3.5 Relationship between Staffing, Workload, and Burnout

Inferential statistics indicated significant and statistically significant negative correlation between staffing patterns and burnout ($r = -0.850$, $p < 0.001$). It implies that more desirable staffing patterns are related to a reduced level of burnout. On the other hand, there was a significant positive correlation between workload and burnout ($r = 0.810$, $p < 0.001$), and the higher the workload the higher the burnout is (Table 5).

Table 5: Relationship between Staffing, Workload, and Burnout

Relationship	r	df	N	p-value	Decision
Staffing Patterns vs. Burnout	-0.850	291	293	< 0.001	Significant
Workload vs. Burnout	0.810	291	293	< 0.001	Significant

4. Discussion

The paper presents a critical interpretative study of the ways in which staffing and workload structures determine the psychological terrain of Public Health Nurses (PHNs) in Rivers State. The results indicate that staffing levels are just satisfactory (51.19%), and there are deep gaps when the number of patients is high (52.22%). This is a major cause of strain at work because of this mismatch between the availability of personnel and the demand of the services. These findings are consistent with recent empirical findings in Sub-Saharan Africa. As an example, Usifo and Salawu (2024) found that the quality of shift organisation and peak demands management in Nigerian hospitals tend to be more predictive of staff burnout than the number of nurses per se. Staffing is a core Job Resource in the Job Demand-Resources (JD-R) model; the marginal adequacy here implies that the resource pool is not adequate to cushion the high demands on PHNs.

Exceptionally high physical (61.43%) and mental (56.31%) demands characterised workload experience. The physical demands such as standing, lifting, and walking are indicative of the varied community-based roles PHNs have in Nigeria, which can be both clinical care and home visits in low-resource areas. This observation is supported by recent studies in Tanzania, which found that high patient volumes (≥41 patients/day) were independently related to a 1.5-fold rise in burnout prevalence (Mfuru *et al*., 2024). Furthermore, the chronic "work overload" and time pressure (54.61%) reported here can lead to "missed care" or care rationing. According to recent studies on diaries, it is proposed that high workload is a direct antecedent of missed nursing care, which in turn mediates the relationship between workload and moral distress in nurses (Cohen *et al*., 2024). The inability to deliver holistic care is another contributor to emotional exhaustion when PHNs are compelled to prioritise tasks because of time constraints.

One significant result is the so-called burnout-engagement paradox. Although 61.43% of PHNs were highly affected by emotional fatigue and depersonalisation, 59.73% of the PHNs still had a strong feeling of personal achievement. This implies that even with systemic forces wearing down PHNs, their impact on the community and professional identity bring them great psychological satisfaction. This persistence can be explained by the JD-R model; although exhaustion occurs due to the job demands (workload), salient job resources (perceived task significance and perceived personal responsibility) can maintain the sense of efficacy and engagement (Cohen *et al*., 2024; Muriithi and Kariuki, 2020). But this hardy profile is dangerous. Comparatively, recent findings in Saudi Arabia revealed that high exhaustion was accompanied by low personal accomplishment, which could indicate that the vocational calling in the Nigerian setting may serve as a short-term protection factor but unsustainable (Hussien *et al*., 2024).

The negative correlation between the workforce and burnout ($r = -0.850$) and the positive correlation with workload ($r = 0.810$) are significant. They suggest that staffing and workload are not just logistical variables but the main predeterminants of psychological well-being of the nursing workforce. These outcomes resonate with the recent international data where perceived insufficient staffing was linked with an almost threefold risk of burnout (OR 2.84) (Kabunga & Okalo, 2021). The same trends were found in Namibia,

where role ambiguity and workload were also found to be the key predictors of social dysfunction and exhaustion, which underscores the applicability of these stressors to the region (Pieters and Matheus, 2020).

Synthesising the findings, it can be concluded that the system of Rivers State PHC is in a high strain state. The use of the vocational resilience of nurses to offset staffing shortages is a risky approach that puts the objectives of Universal Health Coverage at risk. In order to reduce this, the policy interventions should not be limited to mere recruitment. Evidence-based flexible scheduling and requiring minimum ratios of nurses to patients during peak clinics can contribute greatly to the reduction of the health impairment process as described in the JD-R model. Indeed, as it has been seen in recent global changes, the ability to give nurses more control over the length of each shift and to have guaranteed breaks can help to alleviate emotional exhaustion and enhance retention (Mfuru *et al*., 2024). These systemic stressors are not only a staff welfare issue but also a key element to the sustainability of primary healthcare delivery in Nigeria.

5. Conclusion

The research paper concludes that burnout among Public Health Nurses in Rivers State is mainly caused by poor staffing and heavy workloads. Although PHNs are resilient with a great sense of personal accomplishment, the emotional exhaustion and depersonalisation are high, which shows an unsustainable workforce balance. In a bid to protect the primary healthcare system, it is urgent that evidence-based workforce planning, requiring minimal nurse-to-patient ratios, and institutional mental health provision be undertaken. These systemic stressors are critical to address to ensure that the quality of health services provided to the communities in Nigeria is maintained and that the nursing workforce is retained in the country in the long term.

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