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Cadre-Specific Factors Associated with Turnover and Migration Intentions in a Resource- Constrained Health System in Northern Nigeria

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Abstract

Background

Persistent turnover and rising migration intentions among skilled health workers (SHWs) undermine service continuity and workforce stability in resource-constrained health systems. Understanding the determinants of both turnover intention and migration intention is essential for addressing this crisis.

Methods

We conducted a cross-sectional survey among SHWs across northern Nigeria. Multivariate logistic regression models identified factors independently associated with turnover intention and migration intention, reported as adjusted odds ratios (aOR) and 95% confidence intervals (CI). Analyses were further stratified by specific professional cadres (doctors, nurses, and allied health professionals [AHPs]) to capture cadre-specific determinants.

Results

Overall, 865 SHWs were included, of whom 59.0% were male, 55.6% were Hausa-Fulani, 64.0% were married, and 45.2% had less than five years of experience. Turnover and migration intentions were reported by 86.1% and 84.6% of the workforce, respectively. In the final multivariate models, male sex (vs. female) was associated with higher odds of migration intentions (aOR = 2.71, 95% CI: 1.74–4.21, p < .001), especially among doctors (aOR = 3.65, 95% CI: 1.91–6.97, p < .001). SHWs in rural settings had a higher likelihood of turnover intention (aOR = 2.11, 95% CI: 1.09–4.08, p = .028). Furthermore, low organisational commitment was a strong independent determinant of migration intention among doctors (aOR = 5.32, 95% CI: 2.54–11.14, p < .001) and nurses (aOR = 4.37, 95% CI: 1.89–10.09, p = .001). Among AHPs, income below NGN 250,000, reflecting economic vulnerability, was associated with six times higher odds of intention to migrate (aOR = 6.07, 95% CI: 2.18–16.93, p = .001). Notably, belonging to the Hausa-Fulani ethnic majority group was associated with lower odds of intention to migrate for both nurses (aOR = 0.26, 95% CI: 0.11–0.62, p = .002) and AHPs (aOR = 0.39, 95% CI: 0.16–0.97, p = .043).

Conclusion

While economic vulnerability may drive migration intentions, particularly among AHPs, improving organisational commitment and workplace social support is paramount for retaining doctors and nurses. Effective SHW retention strategies will require cadre-specific and culturally grounded policies that strengthen organisational commitment and leverage local social capital to address the persistent shortage of SHWs in Northern Nigeria.

INTRODUCTION

The global health workforce crisis has reached critical proportions, with an estimated shortfall of 18 million workers by 2030.[1] Crucially, this shortfall disproportionately affects low- and middle-income countries (LMICs), where disease burdens remain highest.[1] The imbalance manifests acutely in sub-Saharan Africa, which bears 24% of the global disease burden but accounts for only 3% of the world's skilled health workers (SHWs).[2] Migration of skilled professionals from resource-constrained settings to high-income nations, traditionally conceptualised as “brain drain", exacerbates these disparities through a unidirectional loss of human capital that depletes origin countries while enriching destinations.[3] However, emerging perspectives challenge this linear view, proposing circulatory models where temporary mobility yields reciprocal benefits through skill transfer and diaspora engagement.[4]

Nigeria exemplifies the health workforce tensions facing many African countries. Despite producing a substantial number of doctors, nurses, and allied health professionals (AHPs), chronic understaffing persists due to high SHW turnover and international emigration, precipitated by post-COVID burnout, insecurity, and economic instability.[5] These shortages have been further aggravated by recent soaring inflation (exceeding 34%) and currency (Naira) devaluation, which have eroded real wages and rendered median earnings increasingly insufficient.[6,7] Compounded by longstanding underinvestment and infrastructural constraints, these dynamics contribute to Nigeria’s persistently poor health system performance relative to global benchmarks. With the emergence of new evidence reporting critical shortages of primary care doctors across Europe,[8] Nigeria and other LMICs may face even greater risk of further SHW emigration.

Existing studies have often focused on single professions or aggregated analyses, obscuring cadre-specific differences in workload, autonomy, and other organisational stressors that may heighten burnout and, in turn, turnover intention or migration intention.[9,10] Notably, these studies were predominantly drawn from urban centres in southern Nigeria.[11–16] Consequently, northern Nigeria, distinguished by its unique ethnic composition, security constraints, and rural concentration, remains substantially under-represented. Moreover, AHPs receive limited attention in existing research.

This study addresses these gaps through a multi-cadre examination of turnover intention and migration intention among SHWs in northern Nigeria. By disaggregating across doctors, nurses, and AHPs, it illuminates how uniform macro-level demands manifest asymmetrically across hierarchical structures while exploring contingency evidenced by repatriation aspirations. The research thus pursued four interconnected aims: 1) evaluating the prevalence of turnover and migration intentions both overall and by cadre; 2) identifying the independent correlates of turnover and migration intentions, with cadre-specific granularity; 3) examining migration readiness, preferred destinations, and return plans; and 4) exploring turnover intention reasons to propose hierarchy-sensitive retention strategies that inform resilient universal health coverage (UHC).

Theoretical Framework

Although prior studies have mapped push-pull factors underlying health worker migration intentions,[10] they have rarely applied psychosocial strain frameworks, such as the Job Demands–Resources (JD-R)[17] model, to explain how cadre-specific working conditions shape turnover and migration intentions. The JD-R model posits that high job demands (e.g., workload, emotional strain, and role pressure) and insufficient job resources (e.g., autonomy, supervisory support, and recognition) trigger an impairment pathway that increases burnout and intention to leave, while adequgate resources activate a motivational pathway that strengthens organisational commitment. In Nigeria, health worker cadres differ markedly in workload intensity, autonomy, and access to support. The JD-R model provides a coherent mechanism for examining how variations in job demands and resource access across SHW groups contribute to their decisions to stay, exit, or migrate. Moreover, the JD-R model offers a useful lens for understanding how SHW shortages and persistent push factors in low-density systems shape patterns of worker exit and circulation.

METHODS

Study Design and Setting

Between June 18 and August 31st, 2025, we conducted a quantitative, cross-sectional online survey among SHWs, including medical doctors, nurses/midwives, and AHPs (physiotherapists, medical laboratory scientists, pharmacists, radiographers, dieticians, optometrists, audiologists, and dental technicians) employed in public hospitals across northern Nigeria. The study area encompassed the three geopolitical zones of the region, namely, Northcentral, Northeast, and Northwest.

Sample Size Determination

The minimum sample size for this study was determined using the Cochran formula,[18] $N = Z^2p(1-p)/d^2$, to ensure the study was sufficiently powered for both turnover intention and migration intention. A conservative prevalence (p) of 50% was chosen to maximise variability. With a 95% confidence level (Z) and 5% margin of error (d), this yielded a baseline requirement of 384 participants. To account for the study's disaggregated nature and the complexity of the planned multivariate logistic regression models for the three distinct professional cadres, this target was substantially inflated. The final sample included 865 valid responses, comprising 403 doctors, 288 nurses, and 174 AHPs.

Statistical standards suggest a minimum of 10 to 15 events (cases of the outcome) per variable to ensure model stability and prevent over-fitting.[19] Accordingly, to further evaluate the validity of the disaggregated multivariate analyses, a post-hoc evaluation of the events per variable (EPV) was conducted for each SHW group. Given the high observed prevalence of turnover intention (86.1%) and migration intention (84.6%) in this study, even the smallest professional subgroup (n = 174) yielded more than 140 events for both outcomes. This sample composition provided sufficient statistical power to estimate multivariable-adjusted associations within each cadre, although precision may be lower for groups with fewer respondents.

Participants and Sampling

A non-probability sampling design that combined convenience and snowballing techniques was employed to recruit SHWs across Northern Nigeria. This approach was necessitated by the logistical challenges and operational strain inherent in accessing a large, geographically dispersed workforce across the three geopolitical zones. Recruitment was initiated through digital communication platforms, primarily WhatsApp, of the state chapters of key professional associations and hospital-based forums. To generate a chain-referral sample, initial participants were encouraged to forward the digital survey link to colleagues within their professional networks. While this method introduces a risk of self-selection bias, it proved to be a feasible strategy for achieving the required sample size during the study period.

To ensure a representation of the Nigerian health system's structural variety, participants were recruited from all levels of healthcare, including tertiary, secondary, and primary health centres. Data was collected via the Joint Information Systems Committee (JISC)[20] Online Surveys. Inclusion criteria required participants to be fully qualified doctors, nurses, or AHPs with at least six months of ongoing clinical or administrative practice within the study’s designated zones.

Table 1
Definitions of study outcome measures

S/No	Measures	Definition
1.	Turnover intention	A worker's mindful inclination to exit their employment within a specific timeframe.[21]
2.	Job satisfaction	The degree of fulfilment or enjoyment a worker experiences in their position, particularly regarding salary, leadership, and the environment.[22]
3.	Social support	An individual's sense of having a reliable network of family and workplace peers who can offer emotional backing or tangible aid.[23]
4.	Organisational commitment	The mental connection an individual has to their workplace, which manifests as workplace loyalty and a desire to work hard for organisational success.[24]
5.	Burnout	A condition of psychological, physical, and emotional depletion stemming from long-term professional stress and agitation.[25] Emotional exhaustion refers to the feeling of being emotionally overextended and depleted of one's energy. Depersonalisation indicates the development of negative, callous, or detached responses and cynical attitudes toward clients or coworkers. Personal accomplishment denotes a feeling of competence and successful achievement in one's work.

Outcome measures

The outcome variables were turnover intention and migration intention. Turnover intention was evaluated using the six-item Turnover Intention Scale (TIS-6),[26] which has demonstrated excellent internal consistency in Nigerian samples.[27] Respondents used a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to rate each of the six items, with total scores ranging from 6 to 30. Like previous studies,[28,29] these results were later dichotomised (≤ 15 vs. >15) to denote lower versus higher turnover intentions. Migration intention was assessed as a simple binary variable in line with previous research,[14,30,31] where participants indicated "Yes" or "No" regarding their intention to relocate outside Nigeria within the next five years for professional reasons.

Study instruments and variables

The survey utilised a structured, multi-component questionnaire to assess the sociodemographic, professional, and psychosocial landscape of the health workforce. The questionnaire was prepared following an extensive review of the prior literature[10,32,33] on these topics. A validated five-item job satisfaction scale (JSS-5)[34] was used to assess participants' satisfaction with their job. The scale assesses facets such as professional growth, workload, recognition, and interpersonal relationships. Participants provided ratings on a 5-point scale ranging from "Strongly Dissatisfied" to "Strongly Satisfied". While total scores (5–25) originally allowed for a four-tier categorisation from very low to high satisfaction, they were ultimately dichotomised (low vs high) using a cut-off of 16 for analytical purposes, in line with prior research.[35] Perceived social support, specifically the availability of emotional and practical aid, was evaluated through a four-item adaptation (SSS-4)[36] that maintains robust psychometric properties in Nigerian settings[27]. Frequency of support is measured on a 5-point scale (1 = Never to 5 = Always) having total scores ranging from 4 to 20. In line with similar studies,[37] this measure was split into binary categories for analysis, with scores ≥ 13 indicating higher social support.

We utilised a 6-item organisational commitment scale (OCS-6)[24] given its high internal consistency and validity in previous[38] Nigerian research. Participants rated each item on a 5-point Likert scale, with total scores ranging from 6 to 30, followed by dichotomisation into low (< 18) versus high (≥ 18) commitment status, in line with prior research.[39] Burnout was measured using a nine-item instrument[40] examining emotional exhaustion (EE), depersonalisation (DP), and personal accomplishment (PA), three items/domains. Validation studies in Nigeria[41] have confirmed the reliability of this instrument. Each subscale is scored from 0 to 18 based on a 7-point frequency scale (0 = Never to 6 = Every day). In accordance with the prior approach,[42] total subscale scores were treated as binary variables for the study, with scores exceeding 9 denoting higher burnout in the EE and DP categories, whereas PA scores below 9 indicated higher burnout.

Professional migration readiness was measured using a one-item objective 5-point scale: Level 1 (Exploratory) involves preliminary information gathering and market research; Level 2 (Foundational) covers acquiring local documents like transcripts, passports, and letters of good standing; Level 3 (Evaluative) includes sitting for English proficiency and primary qualifying exams; Level 4 (Credentialed) marks the completion of all licensing exams and registration with foreign professional bodies; and Level 5 (Executive) represents active visa processing and final travel arrangements. For analysis, these were collapsed into Initial (1), Intermediate (2–3), and Advanced (4–5) stages.

This study received ethical approval from the University of Leicester Research Ethics Committee (4095) for the initial MSc dissertation component and from the Kano State Ministry of Health Research Ethics Committee (SHREC/2025/6283). Participants provided informed written consent after receiving information on objectives, procedures, voluntary participation, and withdrawal rights. Anonymity was ensured through aggregated reporting and secure storage, with no identifying data collected. The research complied with the Declaration of Helsinki[43] and national guidelines.

Statistical Analysis

Statistical analysis was performed using SPSS version 26.0 (IBM Corp, Armonk, NY). Descriptive statistics were employed to summarise categorical variables using frequencies and percentages. Mean and standard deviation (SD) were used to summarise continuous variables, such as the respondents' age, while income and planned stay duration were presented as median and interquartile range (IQR). Unadjusted associations between outcome measures

and sociodemographic and psychosocial predictors were evaluated using simple logistic regression models. Variables demonstrating a p-value < 0.2 in the unadjusted models were included in the final multivariate models. Results were reported as adjusted odds ratios (aOR) with 95% confidence intervals (CI), and a p-value of < 0.05 was considered statistically significant.[19] Internal consistency of the multi-item scales was evaluated using Cronbach's alpha, calculated for the overall sample and stratified by cadre, to assess measurement invariance across professional groups. Values ≥ 0.70 were deemed acceptable, with ≥ 0.80 indicating good reliability and ≥ 0.90 excellent reliability, in line with established thresholds.[44] Overall, the instruments demonstrated robust reliability, with the majority of alpha values exceeding the conventional threshold of .70 (**Supplementary Table 1.**).

RESULTS

Sociodemographic and work-related characteristics

The study analysed a total of 865 SHWs in northern Nigeria, comprising 403 doctors (46.6%), 288 nurses (33.3%), and 174 AHPs (20.1%) (**Tables 2 to 4**). The overall mean age was 33.93 years (SD = 7.52), with nurses representing the youngest clinical subgroup at 32.85 years (SD = 8.90). A significant gender disparity was observed across cadres, as 68.0% of doctors and 71.3% of AHPs were male, while 61.1% of the nursing workforce was female. Economic profiles varied substantially by profession, with doctors earning a median monthly salary of 387,000 NGN (IQR: 350,000–550,000) and nurses reporting a median earning of 153,000 NGN (IQR: 120,000–240,000). Furthermore, doctors were predominantly based in tertiary facilities (70.7%), whereas a higher proportion of nurses (55.9%) worked in primary or secondary healthcare settings.

Table 1: Sociodemographic, Work-Related, and Psychosocial Profile of Participants by Professional Cadre (N=865)

Variable	Category	Overall (N=865)	Doctors (N=403)	Nurses (N=288)	AHPs (N=174)
		n (%)	n (%)	n (%)	n (%)
Turnover Intention	Higher TI (>15)	745 (86.1)	351 (87.1)	251 (87.2)	143 (82.2)
	Lower TI (≤15)	120 (13.9)	52 (12.9)	37 (12.8)	31 (17.8)
Migration Intention.	Intending	732 (84.6)	340 (84.4)	253 (87.8)	139 (79.9)
	Not Intending	133 (15.4)	63 (15.6)	35 (12.2)	35 (20.1)
Sociodemographic					
Age (Years)	Mean (SD)	33.93 (7.52)	34.78 (6.33)	32.85 (8.90)	33.64 (7.49)
	<30	237 (27.4)	72 (17.9)	110 (38.2)	55 (31.6)
	30-39	479 (55.4)	260 (64.5)	125 (43.4)	94 (54.0)
	≥40	149 (17.2)	71 (17.6)	53 (18.4)	25 (14.4)
Gender	Male	510 (59.0)	274 (68.0)	112 (38.9)	124 (71.3)
	Female	355 (41.0)	129 (32.0)	176 (61.1)	50 (28.7)
Marital Status	Married	554 (64.0)	288 (71.5)	159 (55.2)	107 (61.5)
	Single	311 (36.0)	115 (28.5)	129 (44.8)	67 (38.5)
Religion	Islam	661 (76.4)	329 (81.6)	195 (67.7)	137 (78.7)
	Christianity	204 (23.6)	74 (18.4)	93 (32.3)	37 (21.3)
Tribe	Others	384 (44.4)	250 (62.0)	157 (54.5)	74 (42.5)
	Hausa-Fulani	481 (55.6)	153 (38.0)	131 (45.5)	100 (57.5)
Work-Related					
Region of Work	North Central	204 (23.6)	87 (21.6)	80 (27.8)	37 (21.3)
	North East	247 (28.6)	76 (18.9)	116 (40.3)	55 (31.6)
	North West	414 (47.8)	240 (59.5)	92 (31.9)	82 (47.1)
Salary (NGN)	Median (IQR)	300k (230k–420k)	387k (350k–550k)	153k (120k–240k)	269k (220k–350k)
	<250,000	375 (43.4)	39 (9.7)	236 (81.9)	100 (57.5)
	250k–350k	151 (17.5)	85 (21.1)	27 (9.4)	39 (22.4)
	≥350,000	339 (39.2)	279 (69.2)	25 (8.7)	35 (20.1)
Extra Income	No	541 (62.5)	272 (67.5)	173 (60.1)	96 (55.2)
	Yes	324 (37.5)	131 (32.5)	115 (39.9)	78 (44.8)
Work Experience	≤5 Years	391 (45.2)	173 (42.9)	130 (45.1)	88 (50.6)
	6–10 Years	261 (30.2)	134 (33.3)	71 (24.7)	56 (32.2)
	>10 Years	213 (24.6)	96 (23.8)	87 (30.2)	30 (17.2)
Facility Rank	Tertiary	510 (59.0)	285 (70.7)	127 (44.1)	98 (56.3)
	Primary/Secondary	355 (41.0)	118 (29.3)	161 (55.9)	76 (43.7)
Location	Urban	707 (81.7)	344 (85.4)	225 (78.1)	138 (79.3)
	Rural	158 (18.3)	59 (14.6)	63 (21.9)	36 (20.7)
Dual Practice	No	621 (71.8)	256 (63.5)	235 (81.6)	130 (74.7)
	Yes	244 (28.2)	147 (36.5)	53 (18.4)	44 (25.3)
Psychosocial					
Job Satisfaction	Lower JS (≤15)	637 (73.6)	330 (81.9)	203 (70.5)	104 (59.8)
	Higher JS (≥16)	228 (26.4)	73 (18.1)	85 (29.5)	70 (40.2)
Social Support	Lower SS (≤12)	543 (62.8)	271 (67.2)	174 (60.4)	98 (56.3)
	Higher SS (≥13)	322 (37.2)	132 (32.8)	114 (39.6)	76 (43.7)
Organisational Commitment	Lower OC (≤18)	734 (84.9)	349 (86.6)	244 (84.7)	141 (81.0)

	Higher OC (≥19)	131 (15.1)	54 (13.4)	44 (15.3)	33 (19.0)
Burnout (EE)	Higher EE (≥10)	766 (88.6)	375 (93.1)	251 (87.2)	140 (80.5)
	Lower EE (≤9)	99 (11.4)	28 (6.9)	37 (12.8)	34 (19.5)
Burnout (DP)	Higher DP (≥10)	537 (62.1)	260 (64.5)	184 (63.9)	93 (53.4)
	Lower DP (≤9)	328 (37.9)	143 (35.5)	104 (36.1)	81 (46.6)
Burnout (PA)	Higher PA (≥10)	810 (93.6)	384 (95.3)	269 (93.4)	157 (90.2)
	Lower PA (≤9)	55 (6.4)	19 (4.7)	19 (6.6)	17 (9.8)

Table 2: Consolidated comparative descriptives of turnover intentions across cadre

Variable	Overall (n=865)		Doctors (n=403)		Nurses (n=288)		AHPs (n=174)	
	Lower TI n (%)	Higher TI n (%)	Lower TI n (%)	Higher TI n (%)	Lower TI n (%)	Higher TI n (%)	Lower TI n (%)	Higher TI n (%)
Age								
<30 years	28 (11.8)	209 (88.2)	4 (5.6)	68 (94.4)	16 (14.5)	94 (85.5)	8 (14.5)	47 (85.5)
30–39 years	67 (14.0)	412 (86.0)	36 (13.8)	224 (86.2)	15 (12.0)	110 (88.0)	16 (17.0)	78 (83.0)
≥40 years	25 (16.8)	124 (83.2)	12 (16.9)	59 (83.1)	6 (11.3)	47 (88.7)	7 (28.0)	18 (72.0)
Gender								
Male	63 (12.4)	447 (87.6)	27 (9.9)	247 (90.1)	11 (9.8)	101 (90.2)	25 (20.2)	99 (79.8)
Female	57 (16.1)	298 (83.9)	25 (19.4)	104 (80.6)	26 (14.8)	150 (85.2)	6 (12.0)	44 (88.0)
Marital Status								
Single	34 (10.9)	277 (89.1)	11 (9.6)	104 (90.4)	14 (10.9)	115 (89.1)	9 (13.4)	58 (86.6)
Married	86 (15.5)	468 (84.5)	41 (14.2)	247 (85.8)	23 (14.5)	136 (85.5)	22 (20.6)	85 (79.4)
Ethnicity								
Hausa-Fulani	68 (14.1)	413 (85.9)	35 (14.0)	215 (86.0)	18 (13.7)	113 (86.3)	15 (15.0)	85 (85.0)
Others	52 (13.5)	332 (86.5)	17 (11.1)	136 (88.9)	19 (12.1)	138 (87.9)	16 (21.6)	58 (78.4)
Religion								
Islam	94 (14.2)	567 (85.8)	43 (13.1)	286 (86.9)	27 (13.8)	168 (86.2)	24 (17.5)	113 (82.5)
Christianity	26 (12.7)	178 (87.3)	9 (12.2)	65 (87.8)	10 (10.8)	83 (89.2)	7 (18.9)	30 (81.1)
Region								
Northwest	54 (13.0)	360 (87.0)	34 (14.2)	206 (85.8)	11 (12.0)	81 (88.0)	9 (11.0)	73 (89.0)
Northeast	35 (14.2)	212 (85.8)	7 (9.2)	69 (90.8)	14 (12.1)	102 (87.9)	14 (25.5)	41 (74.5)
Northcentral	31 (15.2)	173 (84.8)	11 (12.6)	76 (87.4)	12 (15.0)	68 (85.0)	8 (21.6)	29 (78.4)
Monthly Income								
<250k NGN	47 (12.5)	328 (87.5)	2 (5.1)	37 (94.9)	29 (12.3)	207 (87.7)	16 (16.0)	84 (84.0)
250k–350k NGN	18 (11.9)	133 (88.1)	12 (14.1)	73 (85.9)	2 (7.4)	25 (92.6)	4 (10.3)	35 (89.7)
≥350k NGN	55 (16.2)	284 (83.8)	38 (13.6)	241 (86.4)	6 (24.0)	19 (76.0)	11 (31.4)	24 (68.6)
Years of Work Experience								
≤5 years	51 (13.0)	340 (87.0)	19 (11.0)	154 (89.0)	16 (12.3)	114 (87.7)	16 (18.2)	72 (81.8)
6–10 years	36 (13.8)	225 (86.2)	18 (13.4)	116 (86.6)	11 (15.5)	60 (84.5)	7 (12.5)	49 (87.5)
>10 years	33 (15.5)	180 (84.5)	15 (15.6)	81 (84.4)	10 (11.5)	77 (88.5)	8 (26.7)	22 (73.3)
Hospital Rank								
Tertiary	76 (14.9)	434 (85.1)	42 (14.7)	243 (85.3)	16 (12.6)	111 (87.4)	18 (18.4)	80 (81.6)
Primary/Secondary	44 (12.4)	311 (87.6)	10 (8.5)	108 (91.5)	21 (13.0)	140 (87.0)	13 (17.1)	63 (82.9)
Job Location								
Rural	12 (7.6)	146 (92.4)	4 (6.8)	55 (93.2)	6 (9.5)	57 (90.5)	2 (5.6)	34 (94.4)
Urban	108 (15.3)	599 (84.7)	48 (14.0)	296 (86.0)	31 (13.8)	194 (86.2)	29 (21.0)	109 (79.0)

Extra Job								
Yes	32 (13.1)	212 (86.9)	19 (12.9)	128 (87.1)	7 (13.2)	46 (86.8)	6 (13.6)	38 (86.4)
No	88 (14.2)	533 (85.8)	33 (12.9)	223 (87.1)	30 (12.8)	205 (87.2)	25 (19.2)	105 (80.8)
Extra Income								
Yes	51 (15.7)	273 (84.3)	17 (13.0)	114 (87.0)	17 (14.8)	98 (85.2)	17 (21.8)	61 (78.2)
No	69 (12.8)	472 (87.2)	35 (12.9)	237 (87.1)	20 (11.6)	153 (88.4)	14 (14.6)	82 (85.4)
Job Satisfaction								
Lower JS	58 (9.1)	579 (90.9)	29 (8.8)	301 (91.2)	18 (8.9)	185 (91.1)	11 (10.6)	93 (89.4)
Higher JS	62 (27.2)	166 (72.8)	23 (31.5)	50 (68.5)	19 (22.4)	66 (77.6)	20 (28.6)	50 (71.4)
Social Support								
Lower SS	54 (9.9)	489 (90.1)	25 (9.2)	246 (90.8)	16 (9.2)	158 (90.8)	13 (13.3)	85 (86.7)
Higher SS	66 (20.5)	256 (79.5)	27 (20.5)	105 (79.5)	21 (18.4)	93 (81.6)	18 (23.7)	58 (76.3)
Organisational Commitment								
Lower OC	82 (11.2)	652 (88.8)	35 (10.0)	314 (90.0)	24 (9.8)	220 (90.2)	23 (16.3)	118 (83.7)
Higher OC	38 (29.0)	93 (71.0)	17 (31.5)	37 (68.5)	13 (29.5)	31 (70.5)	8 (24.2)	25 (75.8)
Emotional Exhaustion								
Higher EE	89 (11.6)	677 (88.4)	44 (11.7)	331 (88.3)	28 (11.2)	223 (88.8)	17 (12.1)	123 (87.9)
Lower EE	31 (31.3)	68 (68.7)	8 (28.6)	20 (71.4)	9 (24.3)	28 (75.7)	14 (41.2)	20 (58.8)
Depersonalisation								
Higher DP	51 (9.5)	486 (90.5)	21 (8.1)	239 (91.9)	20 (10.9)	164 (89.1)	10 (10.8)	83 (89.2)
Lower DP	69 (21.0)	259 (79.0)	31 (21.7)	112 (78.3)	17 (16.3)	87 (83.7)	21 (25.9)	60 (74.1)
Personal Accomplishment								
Lower PA	13 (23.6)	42 (76.4)	3 (15.8)	16 (84.2)	7 (36.8)	12 (63.2)	3 (17.6)	14 (82.4)
Higher PA	107 (13.2)	703 (86.8)	49 (12.8)	335 (87.2)	30 (11.2)	239 (88.8)	28 (17.8)	129 (82.2)

Table 3: Consolidated comparative descriptives of migration intention across cadre

Variable	Overall (n=865)		Doctors (n=403)		Nurses (n=288)		AHPs (n=174)	
	Lowe MI n (%)	Higher MI n (%)	Lower MI n (%)	Higher MI n (%)	Lower MI n (%)	Higher MI n (%)	Lower MI n (%)	Higher MI n (%)
Age								
<30 years	33 (13.9)	204 (86.1)	12 (16.7)	60 (83.3)	9 (8.2)	101 (91.8)	12 (21.8)	43 (78.2)
30–39 years	66 (13.8)	413 (86.2)	34 (13.1)	226 (86.9)	16 (12.8)	109 (87.2)	16 (17.0)	78 (83.0)
≥40 years	34 (22.8)	115 (77.2)	17 (23.9)	54 (76.1)	10 (18.9)	43 (81.1)	7 (28.0)	18 (72.0)
Gender								
Male	56 (11.0)	454 (89.0)	25 (9.1)	249 (90.9)	12 (10.7)	100 (89.3)	19 (15.3)	105 (84.7)
Female	77 (21.7)	278 (78.3)	38 (29.5)	91 (70.5)	23 (13.1)	153 (86.9)	16 (32.0)	34 (68.0)
Marital Status								
Single	27 (8.7)	284 (91.3)	11 (9.6)	104 (90.4)	7 (5.4)	122 (94.6)	9 (13.4)	58 (86.6)
Married	106 (19.1)	448 (80.9)	52 (18.1)	236 (81.9)	28 (17.6)	131 (82.4)	26 (24.3)	81 (75.7)
Ethnicity								
Hausa-Fulani	88 (18.3)	393 (81.7)	40 (16.0)	210 (84.0)	24 (18.3)	107 (81.7)	24 (24.0)	76 (76.0)
Others	45 (11.7)	339 (88.3)	23 (15.0)	130 (85.0)	11 (7.0)	146 (93.0)	11 (14.9)	63 (85.1)
Religion								
Islam	116 (17.5)	545 (82.5)	57 (17.3)	272 (82.7)	29 (14.9)	166 (85.1)	30 (21.9)	107 (78.1)
Christianity	17 (8.3)	187 (91.7)	6 (8.1)	68 (91.9)	6 (6.5)	87 (93.5)	5 (13.5)	32 (86.5)
Region								
Northwest	79 (19.1)	335 (80.9)	44 (18.3)	196 (81.7)	16 (17.4)	76 (82.6)	19 (23.2)	63 (76.8)
Northeast	22 (8.9)	225 (91.1)	6 (7.9)	70 (92.1)	7 (6.0)	109 (94.0)	9 (16.4)	46 (83.6)
Northcentral	32 (15.7)	172 (84.3)	13 (14.9)	74 (85.1)	12 (15.0)	68 (85.0)	7 (18.9)	30 (81.1)
Monthly Income								
<250k NGN	43 (11.5)	332 (88.5)	3 (7.7)	36 (92.3)	27 (11.4)	209 (88.6)	13 (13.0)	87 (87.0)
250k–350k	24 (15.9)	127 (84.1)	12 (14.1)	73 (85.9)	3 (11.1)	24 (88.9)	9 (23.1)	30 (76.9)
≥350k NGN	66 (19.5)	273 (80.5)	48 (17.2)	231 (82.8)	5 (20.0)	20 (80.0)	13 (37.1)	22 (62.9)
Experience								
≤5 years	46 (11.8)	345 (88.2)	22 (12.7)	151 (87.3)	8 (6.2)	122 (93.8)	16 (18.2)	72 (81.8)
6–10 years	39 (14.9)	222 (85.1)	19 (14.2)	115 (85.8)	10 (14.1)	61 (85.9)	10 (17.9)	46 (82.1)
>10 years	48 (22.5)	165 (77.5)	22 (22.9)	74 (77.1)	17 (19.5)	70 (80.5)	9 (30.0)	21 (70.0)
Hospital Rank								
Tertiary	75 (14.7)	435 (85.3)	42 (14.7)	243 (85.3)	13 (10.2)	114 (89.8)	20 (20.4)	78 (79.6)
Primary/Secondary	58 (16.3)	297 (83.7)	21 (17.8)	97 (82.2)	22 (13.7)	139 (86.3)	15 (19.7)	61 (80.3)
Job Location								
Rural	20 (12.7)	138 (87.3)	8 (13.6)	51 (86.4)	8 (12.7)	55 (87.3)	4 (11.1)	32 (88.9)
Urban	113 (16.0)	594 (84.0)	55 (16.0)	289 (84.0)	27 (12.0)	198 (88.0)	31 (22.5)	107 (77.5)
Extra Job								
Yes	24 (9.8)	220 (90.2)	12 (8.2)	135 (91.8)	7 (13.2)	46 (86.8)	5 (11.4)	39 (88.6)
No	109 (17.6)	512 (82.4)	51 (19.9)	205 (80.1)	28 (11.9)	207 (88.1)	30 (23.1)	100 (76.9)
Extra Income								

Yes	52 (16.0)	272 (84.0)	22 (16.8)	109 (83.2)	12 (10.4)	103 (89.6)	18 (23.1)	60 (76.9)
No	81 (15.0)	460 (85.0)	41 (15.1)	231 (84.9)	23 (13.3)	150 (86.7)	17 (17.7)	79 (82.3)
Job Satisfaction								
Lower JS	75 (11.8)	562 (88.2)	41 (12.4)	289 (87.6)	18 (8.9)	185 (91.1)	16 (15.4)	88 (84.6)
Higher JS	58 (25.4)	170 (74.6)	22 (30.1)	51 (69.9)	17 (20.0)	68 (80.0)	19 (27.1)	51 (72.9)
Social Support								
Lower SS	59 (10.9)	484 (89.1)	26 (9.6)	245 (90.4)	16 (9.2)	158 (90.8)	17 (17.3)	81 (82.7)
Higher SS	74 (23.0)	248 (77.0)	37 (28.0)	95 (72.0)	19 (16.7)	95 (83.3)	18 (23.7)	58 (76.3)
Organisational Commitment								
Lower OC	90 (12.3)	644 (87.7)	40 (11.5)	309 (88.5)	22 (9.0)	222 (91.0)	28 (19.9)	113 (80.1)
Higher OC	43 (32.8)	88 (67.2)	23 (42.6)	31 (57.4)	13 (29.5)	31 (70.5)	7 (21.2)	26 (78.8)
Emotional Exhaustion								
Higher EE	110 (14.4)	656 (85.6)	57 (15.2)	318 (84.8)	30 (12.0)	221 (88.0)	23 (16.4)	117 (83.6)
Lower EE	23 (23.2)	76 (76.8)	6 (21.4)	22 (78.6)	5 (13.5)	32 (86.5)	12 (35.3)	22 (64.7)
Depersonalisation								
Higher DP	71 (13.2)	466 (86.8)	37 (14.2)	223 (85.8)	20 (10.9)	164 (89.1)	14 (15.1)	79 (84.9)
Lower DP	62 (18.9)	266 (81.1)	26 (18.2)	117 (81.8)	15 (14.4)	89 (85.6)	21 (25.9)	60 (74.1)
Personal Accomplishment								
Lower PA	9 (16.4)	46 (83.6)	3 (15.8)	16 (84.2)	3 (15.8)	16 (84.2)	3 (17.6)	14 (82.4)
Higher PA	124 (15.3)	686 (84.7)	60 (15.6)	324 (84.4)	32 (11.9)	237 (88.1)	32 (20.4)	125 (79.6)

Figure 1: Study findings and JD-R Theoretical Interpretation

Figure 2: Comparative Proportions of Turnover Intention and Migration Intention by Professional Cadre.

Factors Associated with Turnover Intention

High turnover intention was prevalent among 86.1% of the participants, with almost identical rates found among doctors (87.1%) and nurses (87.2%) (**Figure 1 and 2**). Healthcare workers in rural settings had more than twice the odds of high turnover intention (aOR = 2.11, 95% CI: 1.09–4.08, p = .028; **Figure 3 and 4**). Psychosocial factors, specifically low job satisfaction (aOR = 2.39, 95% CI: 1.52–3.78, p < .001), high emotional exhaustion (aOR = 2.54, 95% CI: 1.51–4.28, p < .001), and low organisational commitment (aOR = 2.04, 95% CI: 1.25–3.34, p = .005), were significantly associated with higher odds of turnover intention.

Cadre-specific analysis (**Figure 3 and 4**) revealed that among medical doctors, being male (aOR = 2.58, 95% CI: 1.35–4.96, p = .004) and falling within the 30–39-year age bracket (aOR = 4.51, 95% CI: 1.23–16.52, p = .023) were significantly associated with higher odds of turnover intention. Furthermore, low job satisfaction was associated with nearly four times higher odds of turnover intention among doctors (aOR = 3.77, 95% CI: 1.82–7.83, p < .001). For nursing professionals, perception of low personal accomplishment was significantly associated with higher odds of turnover intention (aOR = 4.08, 95% CI: 1.40–11.91, p = .010). Among AHPs, the odds of turnover intention were significantly higher for those in rural locations (aOR = 6.21, 95% CI: 1.24–31.25, p = .026) and those reporting high emotional exhaustion (aOR = 6.38, 95% CI: 2.21–18.37, p = .001).

Factors Associated with Migration Intention

Migration intention was reported by 84.6% of the total sample, with nurses showing the highest frequency at 87.8% (**Figure 1 and 2**). In the final multivariate model (**Figure 3 and 4**) for the overall cohort, male healthcare workers demonstrated significantly higher odds of migration intention (aOR = 2.71, 95% CI: 1.74–4.21, p < .001). Economic and professional drivers were prominent, including an income below 250,000 NGN (aOR = 2.92, 95% CI: 1.49–5.73, p = .002), having less than five years of work experience (aOR = 1.88, 95% CI: 1.10–3.21, p = .021), and holding an extra hospital job (aOR = 2.05, 95% CI: 1.21–3.48, p = .008). Identifying as Christian was also significantly associated with higher odds of intention to migrate (aOR = 2.27, 95% CI: 1.19–4.33, p = .013).

For medical doctors, low organisational commitment was the most powerful determinant of intention to migrate (aOR = 5.32, 95% CI: 2.54–11.14, p < .001). Notably, male doctors (aOR = 3.65, 95% CI: 1.91–6.97, p < .001) and those under the age of 30 (aOR = 2.73, 95% CI: 1.27–5.90, p = .010) compared to those aged 40 and above were more likely to report migration intent. Nursing professionals belonging to the Hausa-Fulani majority (aOR = 0.26, 95% CI: 0.11–0.62, p = .002) and single nurses (aOR = 4.03, 95% CI: 1.62–10.00, p = .003) had higher odds of migration intention. Among AHPs, monthly income below 250,000

NGN yielded the highest odds ratio estimate (aOR = 6.07, 95% CI: 2.18–16.93, p = .001), alongside being male (aOR = 3.37, 95% CI: 1.43–7.94, p = .005) and experiencing high emotional exhaustion (aOR = 3.31, 95% CI: 1.33–8.28, p = .010).

Figure 3: Cadre-Specific Determinants of Turnover and Migration Intentions Among Participants

Figure 4: Factors Associated `With Turnover and Migration Intentions of Participant

NB: This figure only contains statistically significant cadre-specific factors associated with turnover intention and migration intention of the participants. The full statistical models for the bivariate and multivariate logistic regression analyses are provided in the Supplementary Information Tables 2 to 5.

Reported Reasons for Turnover Intention

Descriptive analysis of the primary reasons for turnover intentions (**Figures 5a to d.**) revealed that poor compensation was the most frequently cited factor across all professional groups, affecting over 75% of the overall cohort. For doctors, this was followed by better career advancement (72%), poor working conditions (68%), and high demand/pressure (65%). Nurses reported similar thematic concerns, with poor working conditions (60%) and a poor working environment (52%) being particularly prominent. Psychosocial factors, such as a lack of autonomy and limited recreation, were also cited, albeit less frequently than economic and structural factors. Notably, the influence of family members was the least cited reason for turnover intention across all cadres.

Figure 5: Cadre-specific reasons for turnover intentions of the participants

Migration Readiness, Destinations, and Post-Migration Plans

While migration intention was high, only 18.1% of the overall cohort had reached an advanced stage of preparation, with the highest readiness found among the AHPs group (23.1%). Saudi Arabia was the preferred destination for 35.7% of participants, particularly nurses (43.2%), whereas doctors preferred the United Kingdom (30.0%). Despite the high intention to leave, 81.1% of the participants intended to return to Nigeria after a median stay of 10 years. However, their return plans indicated a notable shift in employment preferences, with 65.4% of the overall cohort (peaking at 71.1% for AHPs) stating they plan on returning to the private health sector (**Table 4.**).

Table 4: Migration Intentions, Readiness, and Post-Migration Plans by Professional Group Intending to Migrate

Variable	Category	Overall (N=732)	Doctors (n=340)	Nurses (n=253)	AHPs (n=139)
Primary Destination country	Saudi Arabia	35.70%	33.30%	43.20%	27.60%
	United Kingdom	26.00%	30.00%	19.40%	28.30%
	Canada	10.40%	5.20%	15.00%	14.50%
	USA	8.90%	10.20%	7.30%	8.60%
	Australia	7.20%	7.20%	6.20%	9.20%
	Other Countries	11.80%	14.10%	8.90%	11.80%
Readiness Stage	Initial	36.20%	41.70%	30.90%	32.20%
	Intermediate	45.60%	42.30%	50.80%	44.70%
	Advanced	18.10%	16.00%	18.40%	23.10%
Intention to Return	Yes (Returning)	81.10%	82.80%	77.70%	83.10%
Planned Stay	Median (Years)	10	10	10	10
Post-return Work Sector Preference	Private (Yes)	65.40%	61.40%	67.60%	71.10%

DISCUSSION

The findings of this study highlight a retention crisis of exceptional severity in Northern Nigeria's healthcare workforce, characterised by turnover intention in 86.1% of participants and migration intention in 84.6%, with remarkable uniformity across cadres. In the context of the African Region's severe SHW density shortfall,[2] such widespread intent signals an existential threat to service continuity and equitable progress in universal health coverage.[2] To our knowledge, this is the first study to simultaneously characterise both intentions across doctors, nurses, and AHPs in a cadre-disaggregated psychosocial profiling at this scale. Three contributions are substantively novel. First, we demonstrate that near-universal intention rates mask cadre-specific mechanisms: organisational commitment is the dominant driver for physicians, intrinsic depletion for nurses, and economic and geographic hardship for AHPs. Second, we document 81.1% stated return intent among those expressing migration intention. Although this return intention has not been empirically verified through longitudinal follow-up, the pattern aligns with brain-circulation frameworks and suggests that departure may be provisional rather than permanent, contingent on institutional reform. Third, although the JD–R pathways were not formally tested in this study, interpreting the observed cadre-specific patterns through the

lens of the JD–R model offers a coherent demand–resource account of how uniform system-level pressures manifest asymmetrically across hierarchical cadres.

Across Nigeria's health workforce, turnover and migration intentions were independently associated with psychosocial stressors, including low organisational commitment, emotional exhaustion, and low job satisfaction, alongside structural factors, including rural posting and low income. These patterns are broadly consistent with regional evidence from sub-Saharan Africa and with post-COVID global workforce literature documenting compounding demand–resource imbalances.[45,46] However, cadre-specific disaggregation reveals distinct pathways. Among both doctors and nurses, low organisational commitment was independently associated with higher odds of both turnover and migration intention, suggesting that attitudinal withdrawal from the institution may be a common antecedent of both internal and international exit. Notably, this pattern follows the pattern from southern Nigerian physicians, where role overload and unmet career expectations are associated with eroded institutional loyalty.[14,15] Among nurses, low personal accomplishment was the strongest turnover intention determinants, while single marital status and low organisational commitment drove migration intention, and Hausa-Fulani ethnicity demonstrated a protective association against migration among nurses and AHPs. As the majority ethnic group in northern Nigeria, notable for its high collectivistic culture,[47,48] workers from these ethnicities more often practice within their region of origin, embedded in dense kinship and community networks. In terms of job embeddedness, stronger community links, fit and anticipated sacrifice predict a lower propensity to leave over and above job attitudes.[49] Another complementary mechanism is access to migration-facilitating social capital. Emigration becomes self-sustaining once diaspora networks lower its cost and risk,[50] and Nigeria's professional diasporas abroad remain concentrated among southern group.[16,51] Northern-trained students show the same lower emigration and stronger return intention compared to southern students.[31] Ethnicity here likely marks regional embeddedness rather than an independent cause, overlapping with the Christian-identity association. This outcome-specific patterning suggests that intrinsic professional depletion may shape decisions to leave the current post, while relational and sociocultural factors (marital ties and ethnic embeddedness) modulate the threshold for international departure. Among AHPs, rural location, emotional exhaustion, and low income generated the largest effect sizes, indicating that structural, geographic, and economic exposures dominate in this cadre in ways that psychosocial interventions alone cannot address. Taken together, these cadre-specific pathways show that while the entire workforce experiences strain, the mechanisms differ in ways that salary adjustments alone cannot resolve this, underscoring the need for tailored retention strategies that strengthen commitment, support, and contextual protections across professional groups. Therefore, policy responses must move beyond uniform salary adjustment toward multifaceted, cadre-tailored packages, since international evidence indicates that retention improves most when financial and non-financial measures are combined rather than applied singly.[32] For doctors and nurses, whose intentions were shaped most by eroded organisational commitment and diminished personal accomplishment, the priority is relational and professional, spanning structured career and specialisation pathways, supportive and participatory supervision, mentorship, professional recognition, and manageable workloads, all of which rebuild the institutional attachment and sense of efficacy whose absence drove intent. For AHPs, in whom rural posting, emotional exhaustion, and income below the vulnerability threshold produced the largest effects, the evidence supports a rural-retention package combining adequate remuneration, hardship allowances, decent housing and working conditions, and continuing education, consistent with WHO recommendations and with Nigerian discrete-choice studies that rank pay, housing, and career progression as the dominant retention attributes.[52,53] Two further priorities cut across cadres. The first is a wage floor that lifts the lowest-paid workers above the economic-vulnerability threshold, given that poor compensation was the most frequently cited reason for intent in every group. The second is reform of public-sector conditions paired with structured reintegration pathways, without which the private-sector orientation of prospective returnees will leave the public system unrelieved.[54] Because these data describe intentions rather than behaviour, such measures warrant local piloting and prospective evaluation rather than wholesale adoption.

Destination preferences and readiness data warrant careful interpretation. Nurses favoured Saudi Arabia (43.2%) and doctors the United Kingdom (30.0%), potentially reflecting differential opportunity structures and credential portability rather than structured career planning. Yet, only 18.1% reached advanced migration preparation, which could indicate genuine provisionality of intent or structural barriers to migration. Nonetheless, the fact that a significant proportion of this workforce has not yet transitioned to irreversible exit stages represents a policy-relevant window regardless of the underlying mechanism. Interestingly, intention to return stood at 81.1% after a median decade abroad, though 65.4% intended to practise in the private sector rather than return to government facilities. The high repatriation aspirations (81.1%) despite pervasive intention are notable; however, stated return intentions are imperfect predictors of actual behaviour. Therefore, this finding should be interpreted with appropriate caution pending prospective follow-up. Importantly, this intent-to-return pattern departs from irreversible brain-drain narratives[55] and illuminates potential for "brain circulation," which involves iterative cycles of skill acquisition abroad and reinvestment upon return.[56–58] Such circulation, observed in managed models like Philippine nursing or Cuban medical internationalism, transforms temporary loss into reciprocal gain through knowledge spillovers and diaspora engagement.[59,60] The notably strong return intent positions Nigeria uniquely to harness this dynamic at scale, converting exodus into renewal via structured reintegration platforms that leverage acquired expertise while addressing domestic grievances. This optimism must be tempered by where returnees intend to work. Their preference for the private sector over government facilities represents a redistribution of the workforce rather than a replenishment of the public system, and such internal movement is a recognised form of brain drain that in some settings depletes the public sector more than emigration does.[45,61] Because the public sector carries the primary, rural, and preventive care on which universal health coverage depends, while private provision concentrates in urban, fee-paying settings, returnees who bypass it offer limited relief to the populations most affected. The value of return, therefore, rests not on repatriation alone but on whether returnees re-enter public service,[61] which depends on the institutional reforms identified throughout this study.

Key limitations of this study are notable. The cross-sectional design precludes causal inference and cannot establish whether psychosocial states precede or follow intention formation, nor whether intentions convert to behaviour. Non-probability sampling via professional association networks introduces selection bias toward digitally accessible, networked respondents, likely under-representing rural primary care workers and those outside formal professional structures. Dichotomisation of all psychosocial scales, while consistent with prior workforce studies, reduces statistical power. The JD–R model was applied as a post-hoc interpretive framework rather than prospectively operationalised; direct measurement of demand and resource subscales with structural

equation modelling would be required to move from interpretation to empirical pathway testing. Finally, the study's geographic scope constrains generalisation to southern Nigeria, where ethnic, economic, and security dynamics differ markedly.

In conclusion, this study documents that northern Nigeria's health workforce crisis is cadre-differentiated and mechanistically heterogeneous, so no single retention strategy will reach all three groups. Retaining doctors calls for commitment-building through career structure and supportive supervision, retaining nurses for professional recognition and relational support, and retaining AHPs for adequate pay, rural incentives, and workload relief, each underpinned by a wage floor for the lowest-paid and by improved public-sector conditions. The high stated return intent, while requiring prospective validation, suggests the workforce may be more recoverable than brain drain narratives imply, particularly if the institutional conditions that drive departure are addressed. Cadre-sensitive, evidence-based, structurally grounded policy is not an aspirational ideal but an operational necessity for any credible path toward workforce resilience and universal health coverage.[2,32,62]

Declarations

Declaration of competing interest

The authors declare no competing interests that may in any way affected the content of this work.

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Author Contribution

Conceptualization, S.K.S., A.S.G.; Data collection, S.K.S., Z.Y.A., M.S.M., A.K.S., S.S., L.O.S.; Methodology, S.K.S., A.S.G.; Formal analysis, S.K.S.; Data curation, S.K.S, Z.A.Y., M.S.M., A.K.S.; Writing—original draft preparation, S.K.S.; Writing—review and editing, A.K.S., Z.A.Y., A.T.B., M.S.M., F.I.T., Y.Z., L.O.S., S.S., M.E., D.G.P., A.S.G.; Supervision, A.S.G., M.E., A.K.S., Y.Z., A.T.B.; Visualization, A.S.G., D.G.P., F.I.T., Z.A.Y., M.S.M., S.S., L.O.S., A.K.S.,Y.Z., A.T.B; Project administration, S.K.S., A.S.G.; Ethics approval acquisition, S.K.S. All authors have read and approved the present version of the manuscript.

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Data availability

Upon reasonable request, data may be provided after approval from the Research Ethics Committee of the Kano State Ministry of Health.

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Figures

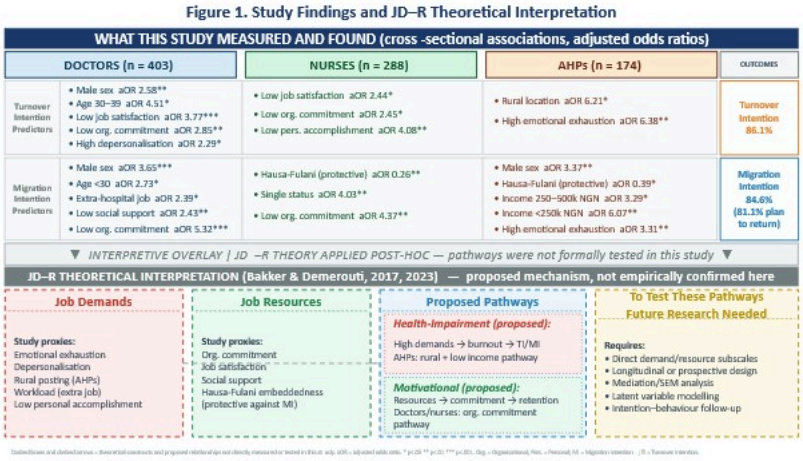


Figure 1

Study findings and JD-R Theoretical Interpretation

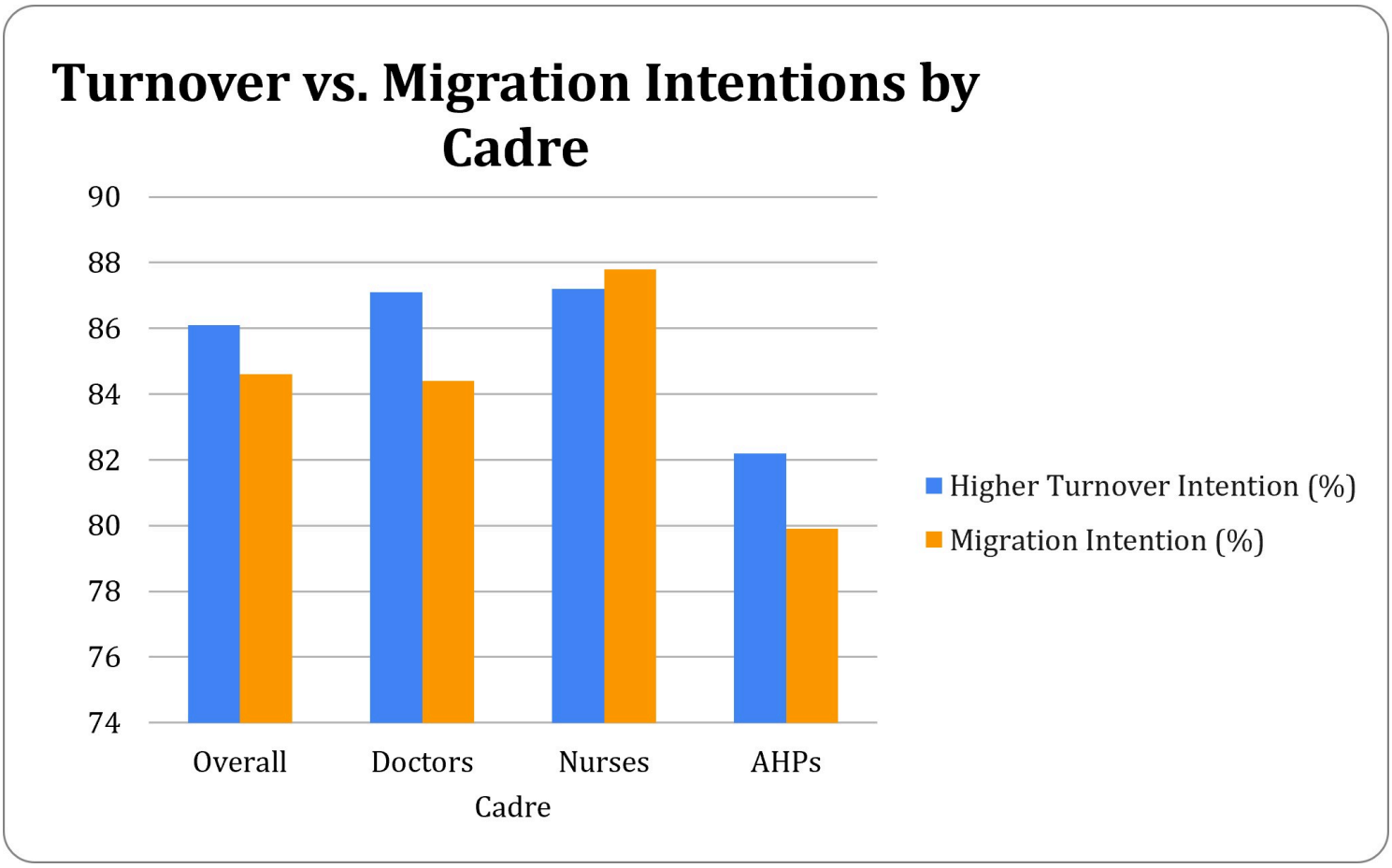


Figure 2

Comparative Proportions of Turnover Intention and Migration Intention by Professional Cadre.

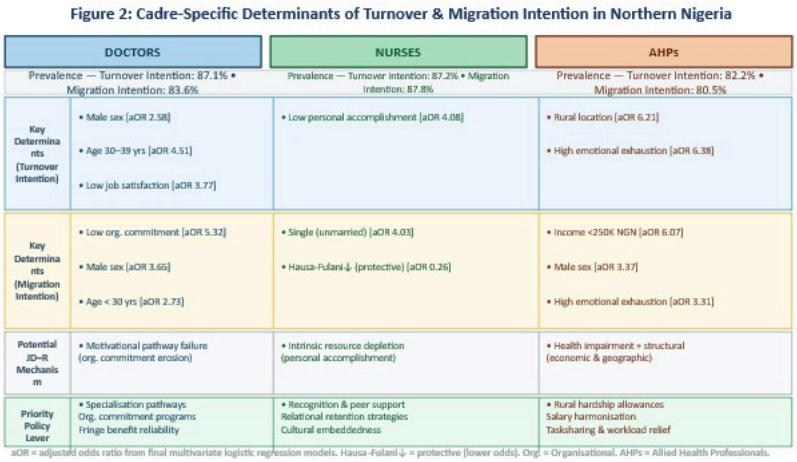


Figure 3

Cadre-Specific Determinants of Turnover and Migration Intentions Among Participants

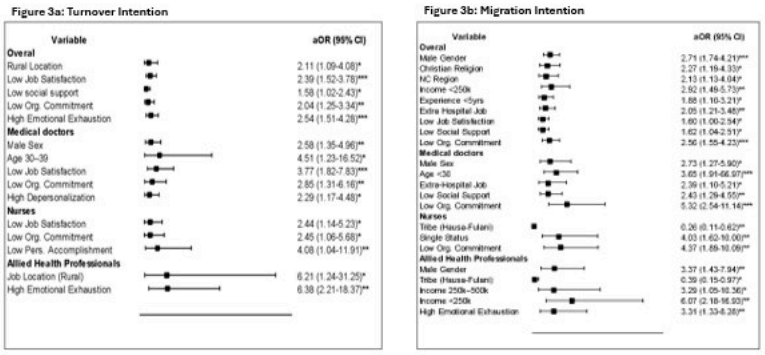


Figure 4

Factors Associated `With Turnover and Migration Intentions of Participant

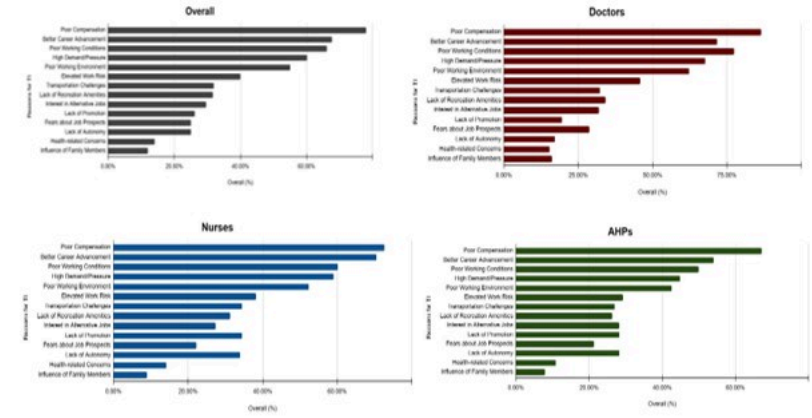


Figure 5

Cadre-specific reasons for turnover intentions of the participants

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