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Transient Autonomic-like Symptoms During Clinical Exposure: A Cross-Sectional Study Among Nigerian Health Workers and Trainees

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Article history: Received 14 July 2025, Reviewed 29 August 2025, Accepted for publication 18 September 2025

Abstract

Background: Transient autonomic symptoms such as dizziness, yawning, sweating, and syncope may occur during clinical procedures, potentially affecting learning and performance. Data from Nigeria are limited. This study assessed their prevalence, patterns, correlates, coping strategies and career effects.

Methods: A descriptive cross-sectional online survey was conducted among medical doctors, nurses, and clinical students in Nigeria. Questionnaire items were adapted from validated scales and contextualised to surgery and blood exposure. Data were analysed using Jamovi with descriptive and inferential statistics.

Results: Of 170 respondents, 55.3% reported at least one symptom. Dizziness (64.9%), sweating (47.9%), and muscle weakness (41.5%) were most frequent, with initial onset usually between 18–34 years. Triggers included surgical theatres and blood exposure. Auras preceded symptoms in 44.7%. Only the 55–64-year age group showed a significant inverse association with symptom occurrence (OR = 0.065; p = 0.035). Coping strategies were reported by 36.2%, mainly avoidance and postural adjustment.

Conclusion: Autonomic-like symptoms are common among Nigerian clinical trainees and health workers, particularly younger individuals. The findings underscore the need for awareness and preparatory interventions during clinical training. Further studies with wider representation and objective assessments are recommended.

Keywords: Autonomic symptoms, vasovagal response, clinical trainees, coping strategies, medical education

How to cite this article

Alerechi-Ogbugo DJ, Emeka-Ogbugo A, Makusidi MM, Bruce I. Transient Autonomic-like Symptoms During Clinical Exposure: A Cross-Sectional Study Among Nigerian Health Workers and Trainees. The Nigerian Health Journal 2025; 25(3): 1134 – 1142.
https://doi.org/10.71637/tnhj.v25i3.1154

INTRODUCTION

Medical training often exposes students and healthcare personnel to physically and emotionally demanding situations. Among these are procedures involving blood, which may trigger autonomic symptoms in some individuals.[1] These symptoms, commonly including frequent yawning, dizziness, nausea, a feeling of thirst, profuse sweating, and even syncope, are typically benign but may impair clinical performance or influence learning experiences.

Although frequently anecdotal, such episodes are generally attributed to a vasovagal response, classically involving an initial sympathetic arousal followed by a parasympathetic surge that results in transient hypotension and reduced cerebral perfusion.[1] While the phenomenon is recognised in developed countries, with studies reporting an incidence of 12-44% in the UK and Poland and a lifetime incidence of about 30%, [1-3] including among medical students and dental trainees, documentation from African contexts, particularly Nigeria, remains sparse or non-existent.

Understanding the occurrence, correlates, and impact of such symptoms is critical in developing support structures for trainees, especially during rotations involving invasive techniques. [3,4] Moreover, assessing whether these episodes influence clinical confidence or specialty preference may yield valuable insights for workforce planning and medical education reform.
This study aims to explore the prevalence of autonomic-like symptoms during clinical exposure among Nigerian healthcare trainees and professionals. It also seeks to describe common symptom patterns, identify precipitating factors, assess coping strategies, and examine whether these experiences influence specialty choices.

METHODOLOGY

Study Design: Descriptive cross-sectional study design was employed.

Study Population: Participants included medical doctors, nurses and clinical medical and nursing students (400 level and above) who had prior exposure to surgical procedures or blood related settings. Individuals without such exposure were excluded.

Sampling Method: Convenience sampling via electronic distribution (e.g., WhatsApp, email, institutional networks).

Sample size determination: A minimum sample size of 384 was estimated using the Raosoft calculator,[5] assuming a 95% confidence level, 5% margin of error, and a response distribution of 50%. Due to feasibility constraints and the exploratory nature of this study, 170 responses were obtained over 12 weeks. While below the recommended sample size, this represents the first Nigerian dataset on this subject and provides preliminary insights to guide future research efforts.

Data Collection/Tool: Data collection was done using a structured online questionnaire via Google Forms. The questionnaire captured demographic characteristics, experience, symptom patterns, known triggers, aura presence, coping strategies, and perceived influence on specialty preference. To measure autonomic symptoms, we adapted symptom items from validated scales such as the Survey of Autonomic Symptoms (SAS) and Autonomic Symptom Profile (ASP)/COMPASS family of scales. We developed 11 yes/no symptom items tailored to exposures common in clinical settings. For validation, two human experts and AI tools reviewed items for clarity, relevance and content sampling. We then piloted the questionnaire with 20 clinical trainees to check comprehension, modify wording and ensure acceptability. The primary outcome was the presence of autonomic symptoms (binary: yes if any of the 11 symptoms were reported; no if none). Other variables included age group, sex, professional role (later collapsed due to sparse data), region of exposure and prior exposure.

Data Analysis Plan: Data were analysed using Jamovi (version 2.6.26). [6,7] Descriptive statistics were used to summarise variables. Responses to open-ended questions on coping strategies were summarised thematically. Associations between categorical variables were assessed using chi-square or Fisher's exact tests when expected cell counts were low. Given a binary outcome and multiple predictors, binary logistic regression was used for bivariate and multivariate analysis. Collapsing professional role categories was done to avoid extreme or undefined odds ratios arising from sparse subgroup counts. Significance was set at $p < 0.05$.

Ethical Considerations: Participation was voluntary and anonymous. Informed consent was obtained from all respondents before participation.

Print ISSN: 0189-9287 Online ISSN: 2992-345X

RESULT

TABLE 1. Sociodemographic Characteristics of Respondents

Variable	Group	Frequency N=170	Percentage (%)
Current Age (years)	18-24	39	22.9
	25-34	87	51.2
	35-44	29	17.1
	45-54	9	5.3
	55-64	5	2.9
	>65	1	0.6
Sex	Female	105	61.8
	Male	65	38.2
Role	Medical Doctor	117	68.8
	Medical student (400-600L)	35	20.6
	Nurse (RN or equivalent)	14	8.2
	Nursing student (300-500L)	4	2.4
Region where clinical rotation began	Southern Nigeria	146	85.9
	Northern Nigeria	18	10.6
	Outside Nigeria	6	3.5
Trained elsewhere?	No	99	58.2
	Yes	71	41.8

Table 1 shows the majority of respondents were aged 25–34 years (51.2%) and female (61.8%). Medical doctors made up 68.8% of participants, with most (85.9%) having clinical exposure in Southern Nigeria

TABLE 2. Prevalence of Autonomic Symptoms, Age of Onset, Triggers and Presence of Aura(S)

Table 2 shows that autonomic-like symptoms were reported by 55.3% of participants during surgical or blood-related procedures, highlighting the relevance of this under-studied issue. Also, all reported symptoms began between ages 18 and

Variable	Frequency (n)	Percentage (%)
Experienced symptoms?	**n=170**	
Yes	94	55.3
No	76	44.7
Age at first symptom (years)		
18-24	**n=94**	52.1
25-34	49	47.9
Triggers (multiple response)	45	
Surgical operations in theatre		56.4
Smell or sight of blood	53	27.7
No specific trigger	26	20.2
Obstetrics & Gynaecology procedure(s)	19	18.2
Emergency trauma care	17	11.7
Cadaver dissection/Autopsy	11	8.5
Minor procedure(s)	8	8.5
Others (prolonged standing, smell of unhygienic places, hunger, ward rounds, nervous surgeon)	8 7	7.7
Dental extractions/ Minor oral procedure(s)		2.1
Warning Sign/Aura present?	2	
No	52	55.3
Yes	25	26.6
Sometimes	17	18.1

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34, with no onset reported above age 34. Common triggers included surgical theatres (56.4%), blood exposure (27.7%), and O&G procedures (18.2%). Premonitory auras were reported in 44.7% (Yes = 26.6%, Sometimes = 18.1%). Nearly half could anticipate symptoms.

Table 3. Sociodemographic Association

Variable	Experienced symptom(s)?					
	No	Yes	Total	Df	X^2	p-value
Have you trained or practised clinically in more than one region?						
No	39	60	99	1	2.71	*0.100*
Yes	37	34	71			
Total	76	94	170			
Sex						
Female	44	61	105	1	0.872	*0.350*
Male	32	33	65			
Total	76	94	170			
Professional role						
Clinical nursing student	1	3	4	3	6.83	*0.078*
Clinical medical student	22	13	35			
Medical doctor	46	71	117			
Nurse (RN or equivalent)	7	7	14			
Total	76	94	170			
Region where clinical rotation began						
Northern Nigeria	6	12	18	2	2.13	*0.345*
Outside Nigeria	4	2	6			
Southern Nigeria	66	80	146			
Total	76	94	170			
Current age (years)						
18-24	17	22	39	5	5.68	*0.339*
25-34	41	46	87			
35-44	10	19	29			
45-54	3	6	9			
55-64	4	1	5			
>65	1	0	1			
Total	76	94	170			

Table 3 shows that no statistically significant associations were found between symptom occurrence and sex ($p = 0.143$), role ($p = 0.078$), region ($p = 0.445$), or age group ($p = 0.145$). Symptoms occurred across demographic groups. A near-significant trend was observed for professional role.

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Table 4. Symptom Pattern, Influence on Specialty Choice, Coping Strategies

Variable	Outcome	Outcome
Symptom pattern (multiple response)		**Percentage (%)**
Dizziness	61	64.9
Profuse sweating	45	47.9
Muscle weakness	39	41.5
Nausea	33	35.1
Increased yawning	22	23.4
Palpitation	22	23.4
Syncope	18	19.1
Breathing difficulty	10	10.6
Others (Blurry vision, Abdominal discomfort, Giddiness)	3	3.3
Use coping strategies?		
No	60	63.8
Yes	34	36.2
Coping strategy (select all that apply)		
Avoidance	9	21.9
Position adjustment/sitting	7	17.1
Hydration/sugary drinks	4	9.8
Breathing techniques	4	9.8
Rest/sleep preparation	4	9.8
Environmental adjustments	3	7.3
Nutritional preparation	3	7.3
Psychological coping	3	7.3
Medication use	2	4.9
No coping strategy	1	2.4
Gradual exposure/Desensitisation	1	2.4
***Influence on specialty choice**	**Symptom present**	
No	69	73.4%
Yes	25	26.6%
Total	94	100

*Fisher's Exact Test; *p=1.000*

The most frequent symptoms were dizziness (64.9%), profuse sweating (47.9%), and muscle weakness (41.5%). Syncope was reported by 19.1%. Among respondents who experienced symptoms, 36.2% employed coping strategies. The most frequent were avoidance (21.9%), sitting or postural adjustment (17.1%), and hydration or glucose intake (9.8%). Also, only 25 participants reported that autonomic symptoms influenced their specialty consideration. Fisher's Exact Test showed no significant association between symptom experience and influence on specialty choice (p = 1.000).

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Table 5. Predictors of Symptom Exposure

Predictor	Category	N with symptoms (%)	Bivi. OR (95% CI)	p (Biv.)	Multiv. OR (95% CI)	p (Multi)
Age group (years)	18-24 (Ref)	22 (12.9)	0.9 (0.41-1.85)	0.71	1.00 (Ref)	-
	25-34	46 (27.1)	1.5 (0.54-3.96)	0.45	0.30(0.09-1.03)	*0.057*
	35-44	19 (11.2)	1.5 (0.34-7.09)	0.57	0.48 (0.11-2.06)	*0.322*
	45-54	6 (3.5)	0.2 (0.02-1.89)	0.16	0.57 (0.09-3.67)	*0.558*
	55-64	1 (0.6)	3.65e-7 (0.00-inf)	0.99	0.06 (0.01-0.82)	***0.035****
Sex						
	Male (Ref)	61 (35.9)		0.09	1.00 (Ref)	**-**
Profession	Female	33(19.4)	1.39 (0.94-2.04)	0.35	0.58(0.28-1.20)	*0.143*
	Nursing (Ref)	10 (5.9)	0.74 (0.39-1.39)	0.34	1.00 (Ref)	**-**
Region where clinical rotation began	Medical	84 (.4)	3.00 (0.31-28.8)	0.57	1.01(0.37-2.71)	*0.981*
	North (Ref)	12 (7.1)	0.51 (0.05-5.10)	0.17	1.00 (Ref)	-
	Abroad	2 (1.2)	2.00 (0.75-5.33)	0.17	0.22 (0.02-1.99)	*0.180*
	South	80 (47.1)	0.25 (0.03-1.77)	0.34	0.64 (0.20-2.03)	*0.445*
			0.60 (0.21-1.70)			

Key: n with symptoms (%) = number with "yes" out of total in that category (and percentage); Ref: Reference category; Bivi: Bivariate; Multivi: Multivariate

From Table 5: Logistic regression identified age group 55-64 as the only significant predictor. Respondents were significantly less likely to report symptoms than those aged 18–24 (OR = 0.06; 95% CI: 0.01–0.82; p = 0.035). Other predictors, including sex, region, and professional background (collapsed into medical vs nursing), were not significantly associated with symptom occurrence.

DISCUSSION

This study provides novel insight into the experience of autonomic-like symptoms during clinical procedures among Nigerian health workers and trainees. The majority of respondents were aged 25–34 years (51.2%) and female (61.8%), reflecting the demographic profile of early-career clinical professionals. Medical doctors accounted for 68.8% of participants, and most (85.9%) had clinical exposure in Southern Nigeria, which may influence symptom reporting patterns based on institutional culture and case mix.

Over half (55.3%) of respondents reported experiencing autonomic-like symptoms such as dizziness, profuse sweating, or faintness during procedural exposure. This prevalence exceeds previously reported estimates, where lifetime incidence has been reported to be about 30%, with incidence rates ranging between 14–44% in the general population. [1-3] The higher rate observed in this study in the absence of prior national literature highlights an important under-recognised issue in clinical training. Underreporting may reflect stigma, internalised shame, or fear of being perceived as unfit for certain specialties. This silence may contribute to under-preparation among vulnerable trainees and missed opportunities for early intervention. Raising awareness and legitimising these experiences could support more open discussion and targeted interventions.

Symptom onset clustered exclusively between the ages of 18 and 34 years, aligning with the period of initial clinical exposure. This suggests that such reactions are most likely to occur when trainees first encounter procedures involving blood.[3] The most commonly reported symptoms (dizziness, profuse sweating, muscle weakness) were consistent with vasovagal or transient autonomic responses described in other settings.[2-4] Although syncope was reported, most episodes appeared to remain presyncopal, indicating that partial compensatory mechanisms may often prevent full fainting.[1]

Triggers were largely environmental and procedural, with surgical theatres and the sight/smell of blood most frequently implicated. Importantly, nearly half of those affected described experiencing a premonitory aura,

Print ISSN: 0189-9287 Online ISSN: 2992-345X

suggesting a potential opportunity for early recognition and intervention.

Despite the high prevalence of symptoms, there was no statistically significant association between these experiences and influence on specialty choice. This may reflect either resilience or an unwillingness to disclose the true extent of such influence, particularly in a culture where stoicism is valued in clinical training.
The logistic regression model identified age 55–64 as the only significant predictor of symptom occurrence. Respondents in this age group were markedly less likely to report symptoms than their younger counterparts, suggesting that age-related physiological resilience, desensitisation, or a more developed emotional regulation may play protective roles. Other variables, including sex, region, and professional background (even after collapsing categories), were not significant predictors. Profession-related odds ratios stabilised following category collapse but remained non-significant, suggesting that autonomic symptom experience may cut across health disciplines, particularly in early exposure.

Coping strategies were mostly informal and reactive. Structured desensitisation or psychological support strategies were rarely reported. Avoidance, sitting down, and hydration were the most commonly reported methods. Notably, very few participants mentioned proactive coping strategies such as desensitisation, psychological preparation, or structured support. This highlights an important gap in clinical training support systems.

Taken together, the findings point to the need for more structured recognition and management of autonomic-like responses in clinical training environments. Medical schools should incorporate orientation sessions that acknowledge and normalise such experiences, teach early identification of auras, and provide practical coping techniques. Simulation labs and supervised exposure may serve to gradually increase procedural tolerance among vulnerable individuals.
In addition, institutional support structures, including confidential reporting systems and optional debriefing for affected students, may reduce stigma and improve psychological safety. Though the experience may not ultimately affect long-term specialty decisions, its impact on procedural learning, self-confidence, and acute functioning in the theatre should not be overlooked.
This study lays the groundwork for further research into emotional and autonomic responses in clinical training in low- and middle-income settings. It also calls attention to the need for institutional and cultural change to support the psychological safety of learners in high-stakes clinical environments.

Limitation

This study has several limitations that should be acknowledged. Firstly, the relatively small sample size reduced the statistical power to detect significant associations and limited the precision of prevalence estimates. Nonetheless, the study provides valuable exploratory insight, particularly as the first known attempt to characterise this phenomenon within the Nigerian context.

Secondly, the use of convenience sampling through online platforms introduced potential selection bias. Participants with greater interest in or personal experience of the subject matter may have been more likely to respond, which could have skewed the findings. Thirdly, the distribution of respondents was skewed towards those with medical training, with relatively fewer nurses and nursing students represented. To address model instability caused by sparse data in subgroup comparisons, professional categories were collapsed into “medical” and “nursing” groups. While this improved model stability, the limited representation of nursing professionals may still affect the precision and generalisability of estimates related to professional background.

Future research should aim for broader and more balanced sampling across institutions and health professions, ideally through multi-centre collaboration, to enhance representativeness and statistical robustness.

Implication of the Findings

The study's findings have several implications. First, the high prevalence of autonomic-like symptoms (55%) among clinical trainees and health workers in Nigeria, beginning almost exclusively between ages 18-34 years, suggests that these physiological responses are widespread yet under-recognised in clinical training settings. This aligns with other work noting that medical students frequently report autonomic symptoms during

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exposure to blood or surgical environments, indicating that procedural exposure is a consistent trigger across settings.[1, 2, 9, 10]

Second, the predominance of passive coping strategies and minimal influence on specialty choice underscores missed opportunities for intervention. Studies of stress and coping among medical students in Nigeria have shown that adaptive strategies (like planning, positive reframing) are more effective and associated with better academic and psychological outcomes. [3, 8, 11] Thus, structured coping education, mentorship, and psychological preparation before high-stress clinical rotations could improve well-being and procedural participation. If unaddressed, it could lead to attrition or avoidance of high-stress specialities, with downstream effects on workforce distribution.

Third, the fact that age 55-64 years was the only significant predictor suggests resilience may increase with duration of exposure or maturity. Still, it may also reflect that younger trainees are more vulnerable. This invites further research, i.e. longitudinal or mixed-methods research to examine how emotional, psychological, or experiential factors (e.g. anxiety, prior exposure) modulate these symptoms over time.[11]
Finally, from a policy and training perspective, medical schools and teaching hospitals should incorporate orientation or pre-procedural induction modules that normalise autonomic symptoms, teach recognition of early warning signs (auras), and provide practical, proactive coping tools. Doing so may reduce discomfort, improve confidence, and possibly prevent anxiety or avoidance of certain types of clinical work. Given that studies cited show that this is not a niche problem, efforts to address it could have broad impact. [8,12, 13]

CONCLUSION

Autonomic-like symptoms are common among Nigerian health workers and clinical trainees, particularly during early exposure to clinical procedures. Most episodes were mild and occurred in predictable settings, often with premonitory auras. While these symptoms did not significantly affect specialty choice, coping strategies were largely passive. The findings highlight the need for structured support and further research into prevention and management within clinical training.

Generative Ai Statement: The authors declare that generative AI was used in the creation of this manuscript. Grammarly was used solely for grammatical corrections. The final manuscript is the original intellectual work of the authors.

Human Ethics and Consent to Participate Declarations: Not applicable.
Consent For Publication: This manuscript represents an honest work, it has been read and approved by the aforementioned authors for review and subsequent publication by the journal.
Acknowledgements: To the respondents who volunteered to be part of the study, thank you. Special thanks to Dr Jombo, R. S., for coordinating data collection.

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Print ISSN: 0189-9287 Online ISSN: 2992-345X