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# NOISE AS A DISTRACTION: INVESTIGATING ITS INFLUENCE ON MEDICATION INFORMATION SAFETY AND ERROR RATES AMONG MEDICAL DOCTORS IN AHMADU BELLO UNIVERSITY MEDICAL CENTRE, ZARIA

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**Abstract**
This study examined noise as a source of distraction and its influence on medication safety and error rates among medical doctors at Ahmadu Bello University Medical Centre (ABUMC), Zaria. It was guided by two key questions: how doctors perceive the impact of environmental noise on concentration and clinical decision-making, and the common types and sources of noise during medication-related tasks. A qualitative descriptive design was adopted, involving purposive sampling of 10 doctors with at least two years of clinical experience. Data were collected through semi-structured interviews, transcribed verbatim, and analyzed thematically. The findings revealed that doctors perceive environmental noise as a significant cognitive disruptor that reduces focus and heightens the likelihood of medication errors. Human-generated disturbances particularly conversations, noise from waiting areas, and unauthorized entries were identified as the most frequent sources. Although systems exist to minimize medication errors, environmental noise remains an overlooked factor. The study concludes that human-induced noise constitutes a substantial risk to medication safety. It recommends that ABUMC management implement targeted noise-reduction strategies, including soundproof partitions, designated quiet zones, and clear signage, as well as enforce policies restricting unauthorized room entries to protect doctors' concentration and enhance patient safety.

Key Words: **Noise distraction, Medication safety, Medication Information errors**

## Introduction

Medication safety represents a fundamental pillar of quality healthcare delivery, yet errors in the medication process continue to pose a significant threat to patient well-being, potentially leading to prolonged hospitalization, serious harm, or even mortality (Institute of Medicine, 2000). Among the multifactorial causes of these errors, environmental noise has gained increasing recognition as a potent and often unaddressed contributor (Cabilan, Hughes, & Chan, 2021). In clinical settings, this noise emanating from sources such as ringing telephones, patient monitoring alarms, staff conversations, and general movement creates a disruptive soundscape that can critically impair cognitive functions (Flynn, Barker, & Allen, 2022). This study specifically examines **environmental noise** as its central independent variable, focusing

on the specific types and frequency of these auditory distractions during medication tasks. The research then investigates how these variable influences key dependent variables: the **concentration** and **clinical decision-making** of medical doctors, and the ultimate outcome of **medication error rates**. The relationship is further nuanced by the **perception** of the clinicians, which mediates how noise translates into cognitive load and clinical performance (Choudhury & Shankar, 2021). While global bodies like the World Health Organization (WHO, 2022) have identified environmental distractions as a key factor in unsafe clinical practices, a conspicuous gap remains in the Nigerian context. Specifically, there is a lack of empirical research within university medical centers, such as the Ahmadu Bello University Medical Centre (ABUMC) in Zaria that systematically investigates this relationship. This study therefore aims to bridge this gap by exploring the influence of environmental noise on the medication-related practices of doctors at ABUMC, with the goal of generating localized evidence to inform targeted risk-mitigation strategies.

**Statement of the Problem**

The high prevalence of medication errors is a global healthcare challenge, with environmental factors like noise being identified as a significant contributor to cognitive distraction and clinical mistakes (WHO, 2022; Flynn et al., 2022). International research has firmly established a correlation between hospital noise levels and increased error rates in medication administration, highlighting a universal patient safety concern.

However, a critical gap exists in the contextual application of this knowledge. While the problem is recognized globally, there is a severe scarcity of empirical research investigating this phenomenon within the specific context of Nigerian tertiary hospitals. The auditory environment, workflow pressures, and infrastructural realities of a institution like the Ahmadu Bello University Medical Centre (ABUMC), Zaria, are unique. Generalizing findings from Western or other contexts is inadequate, as the types, intensity, and perceived impact of environmental noise may differ significantly. Consequently, hospital administrators at ABUMC and similar Nigerian institutions lack localized, evidence-based data to design and justify targeted interventions. This research gap leaves a critical vulnerability unaddressed, potentially perpetuating a higher risk of preventable medication errors and compromising patient safety.

Therefore, this study tends to move from a general awareness of the problem to a precise, contextual understanding. It aims to systematically diagnose the impact of environmental noise on medication safety specifically at ABUMC, Zaria.

The aim of this study is to investigate the influence of environmental noise on medication information safety and error rates among medical doctors at the Ahmadu Bello University Medical Centre, Zaria.

**Research questions**

1. How do medical doctors at Ahmadu Bello University Medical Centre perceive the effect of environmental noise on their concentration and clinical decision-making during medication administration?
2. What types of environmental noise are most commonly reported by medical doctors, and how frequently do they occur during medication-related tasks?

**Literature review**

Recent scholarly investigations elucidate that healthcare practitioners, encompassing medical doctors, recognize environmental auditory disturbances as a significant stressor that detrimentally influences their focus and clinical efficacy. A comprehensive analysis conducted by Kracht, Busch, and Senninger (2021) emphasized that more than fifty percent of operating room personnel perceived noise levels as perturbing, resulting in heightened stress and the potential for diminished task performance. Correspondingly, a global survey executed within intensive care units (ICUs) demonstrated that healthcare professionals identified transient human sounds, such as elevated dialogues and laughter, as particularly intrusive to their professional milieu (Darbyshire, Young, & Greig, 2022). These observations imply a shared understanding among medical practitioners concerning the adverse ramifications of environmental noise on their cognitive capabilities and decision-making processes.

The origins of environmental noise within clinical environments are multifaceted, with certain varieties being more predominant and disruptive. The international survey by Darbyshire, Young, and Greig, (2022) delineated the following prevalent sources: Human-Generated Sounds: Interactions among personnel, laughter, and vocal outbursts were frequently acknowledged as considerable disturbances; Medical Equipment Alarms: The incessant and occasionally superfluous alarms emitted by medical apparatus contribute significantly to the cumulative noise levels; Object-Related Noises: Noises arising from the manipulation or inadvertent dropping of objects, such as surgical instruments, were similarly recognized as disruptive. These auditory disturbances not only exhibit a high prevalence but also manifest with considerable frequency during critical operational tasks, including the administration of medication and surgical interventions. The sporadic and unpredictable characteristics of these sounds amplify their disruptive capacity.

Although specific empirical data regarding the precise frequency of environmental noise during medication administration remain sparse, the ubiquitous presence of the aforementioned noise sources indicates a consistent exposure during such procedures. The ICU survey revealed that auditory disturbances were particularly pronounced during moments of heightened activity, such as ward rounds and patient admissions (Darbyshire, Young, & Greig, 2022). Given that the administration of medication frequently coincides with these bustling intervals, it is reasonable to deduce that medical doctors regularly confront environmental noise during these pivotal tasks. The ramifications of environmental noise transcend mere inconvenience, potentially jeopardizing patient safety. Elevated auditory levels have been correlated with increased stress among healthcare professionals, which can hinder cognitive functions vital for precise clinical decision-making (Kracht, Busch, and Senninger, 2021). Moreover, the distractions engendered by noise can precipitate errors in medication administration, thereby posing direct risks to patient outcomes.

Contemporary academic discourse accentuates the substantial influence of environmental noise on medical doctors' concentration and clinical decision-making during the administration of medication. Human-generated sounds, medical equipment alarms, and object-related noises are frequently cited sources that recurrently manifest during critical tasks. Mitigating these environmental factors is imperative to enhance the working conditions of healthcare professionals and to bolster patient safety.

## Methodology

This study adopted a **qualitative descriptive research design** to explore how medical doctors at Ahmadu Bello University Medical Centre (ABUMC), Zaria, perceive the effect of environmental noise on their concentration and clinical decision-making during medication administration. This design is appropriate for capturing rich, in-depth insights into lived experiences and subjective perceptions of participants within

their natural work environment. The target population were all the thirty-two (32) **medical doctors** working in various departments (e.g., internal medicine, surgery, emergency unit) at ABUMC. Purposive sampling was employed to select participants who have at least **two years of clinical experience** and are **actively involved in medication administration.** Data saturation was reached after the 6th participants but the interviewer went further to interview four more participants, given a total of 10 participants interviewed. Data was collected using **semi-structured in-depth interview**. Each interview last approximately **20–25 minutes,** conducted face-to-face. With participant consent, all interviews were **audio-recorded** and later **transcribed verbatim** for analysis. Data were analyzed using **thematic analysis**

**Data presentation**

Commented [WU1]: Where are your data presentation aimed at answering the research questions? See your research questions above – answer it using appropriate statistical tool. Show the figures of your interview conducted with the respospondents?

The perceive effect of environmental noise on the concentration and clinical decision-making during medication administration by medical doctors at Ahmadu Bello University Medical Centre

This objective sought to determine the perceive effect of environmental noise on the concentration and clinical decision-making during medication administration by medical doctors at Ahmadu Bello University Medical Centre. One themes emerged through the analysis of the data collected on the perceive effect of environmental noise of the participants in the study setting. These themes are presented in table 1

| RQ | Research question | Themes | Sub-themes |
|---|---|---|---|
| 1 | How do medical doctors at Ahmadu Bello University Medical Centre perceive the effect of environmental noise on their concentration and clinical decision-making during medication administration? | Negative Perception | 1.1 Harmful |

**Source- Interview Analysis, 2024**

**Perception of the effect of environmental noise on the concentration and clinical decision-making during medication administration:** Perception has to do with one's understanding, insight, cognition among others, which can either be positive or negative. This insight affect how medical doctors evaluate environmental noise on the concentration and clinical decision-making during medication administration. To identify the insight that medical doctors in ABUMC has on the effect of noise on environmental noise on the concentration and clinical decision-making, the respondents were interviewed on that issue. From the analysis, one theme emerged, which is negative perception, with the sub-theme Harmful as presented further as:

***Negative Perception:*** Negative perception is the only theme that emerged from the narratives of the respondents on how distractions in the consulting environment affect concentration and accuracy during clinical tasks. This as expressed by Participant I that:

> "*You see, ehmmm the consulting environment is supposed to be in a place where there is some level of confidentiality and privacy. Ehmmm in a busy environment like we have here, some of the time, there could be many distractions. Take for example, like in the course of this interview, you could see a distraction just now, presenting somebody coming in to present this. It might distract me if I am prescribing a drug for example, to look at that and while I'm looking at what is presenting to me and I'm still writing, I might write …. Because I'm not fully concentrating."*

Participant II added that: "*distraction can make one make mistake for instance, as I was prescribing and somebody now enter instead of writing 10mg and I now add another "0" making 100mg you see is an error".*

**2. Types and sources of environmental noise are most commonly reported by medical doctors, and how frequently do they occur during medication-related tasks**

This objective sought to determine the types and sources of environmental noise commonly reported by medical doctors, and how frequently it occur during medication-related tasks. One themes emerged and two sub-themes through the analysis of the data collected from the participant in the study settingThese themes are presented in table 2 as follows:

| RQ | Research question | Themes | Sub-themes |
|---|---|---|---|
| 2 | What types of environmental noise are most commonly reported by medical doctors, and how frequently do they occur during medication-related tasks? | Human-generated distraction | 1.1 Lack of privacy,<br>1.2 Interruptions |

**Source- Interview Analysis, 2024**

**Type of environmental noise mostly commonly reported and frequency of occurrence during medication-related tasks:** There are various kind and sources environmental noise that mostly affect medication related tasks. To certain those sources, the respondents were asked questions related to that issue. From the analysis of the narratives, one themes emerged, which is Type with reference to human-generated distraction. This theme has two sub-themes. These are: Lack of privacy, and Interruptions:

**Type with reference to human-generated distraction**: This is the only theme that emerged from the narrative of the respondents with reference to type of environmental noise common in the organization. From the analysis of the narratives, two sub-themes emerged from this theme. These are: Lack of privacy, and Interruptions, as these is further expressed as:

***Lack of privacy:*** This is the first theme that emerged from the theme type with reference to Human-generated distraction. This as narrated by Participant I that: "*presenting somebody coming in to present this …. This can happen anytime"* While participant 11 added that "*somebody now enter instead of writing….. at any time"*

***Interruptions:*** This gives an account for the second theme on type of environmental noise among Medical Doctors in Ahmadu Bello University Medical Centre, Zaria and how often such occur to cognitively stable making it possible for Medication Errors to occur.Type that has to do with interruptions: Participant IV crown it up by saying: "*you know this environment is always noisy especially when students are around"*

**Discussion**

The perception of medical doctors in Ahmadu Bello University Medical Centre on environmental noise on their concentration and clinical decision-making during medical administration is such that it affects their cognition which could result to medication error. For instance, they view environmental noise as such coming from within the consultation area, unnecessarily entering consultation room by some unexpected visitors demanding immediate attention of the Medical Doctor. During consultation, Medical Doctor need full concentration as the task they are performing is a cognitive processing that required adequate attention (Feil, 2013). Any little distraction from any source affect the memory (Krugh, 2012), which could hamper the physician's output which may lead to medication errors. This concept is related to Rasmussen, Pejtersen, and Goodstein's Cognitive Work Analysis where the authors noted that work environment affects how a work place operates, the way of operation shapes the task that the actor do, the task affects the decision that an actor make which can be hampered by stress/tiredness. That is why Kracht, Busch, and Senninger (2021) emphasized that more than fifty percent of operating room personnel perceived noise levels as perturbing,

resulting in heightened stress and the potential for diminished task performance; as this noise come from different source.

The Sources and type of environmental noise among medical doctors in Ahmadu Bello University Medical Centre, Zaria is human generated distraction which range from noise at the awaiting room, unnecessary entering the consultation room among other were the most common environmental noise reported by the medical doctors. In line with this, Darbyshire, Young, and Greig, (2022) delineated the following that Human-Generated Sounds such as Interactions among personnel, laughter, and vocal outbursts were frequently acknowledged as considerable disturbances. Even though it was gathered from the respondents that there are multiple layers of channel to checkmate the occurrence of medication errors in the institute, however, with these channels, environmental noise has not been addressed. This situation can be explained using James Reason's Swiss Cheese Model which provides a comprehensive framework for understanding how system failures, such as medication errors, occur. In this model, healthcare systems are visualized as layers of defense, each with inherent vulnerabilities or "holes." When these vulnerabilities align, they create a pathway for errors to occur. Distractions and interruptions serve as active failures that penetrate these defenses, increasing the likelihood of medication errors (Schutijser, 2019).

**Conclusion**

Human-Generated form environmental noise such as noise forms the awaiting room, unexpected entering of consultation room during consultation among others in clinical settings are a significant source of medication errors among medical doctors. Theoretical frameworks like Reason's Swiss Cheese Model, along with empirical studies, illustrate how interruptions compromise patient safety by creating active failures within healthcare systems. Addressing these issues requires systemic interventions aimed at minimizing distractions, managing workloads, and mitigating fatigue to enhance medication safety.

**Recommendation**

Management of ABUMC should implement noise-reduction strategies, such as installing soundproof partitions, designated quiet zones, and signage reminding staff and patients to maintain silence during consultations.

Furthermore, management of ABUMC should enforce policies that limit unauthorized entry into consultation rooms during active sessions to reduce interruptions and preserve doctors' focus.

In addition, management should organize constant training such as workshop, seminar among other for new and old medical doctors develop awareness and coping mechanisms for managing interruptions without compromising decision-making accuracy.

**References**


Cabilan, C. J., Hughes, J. M., & Chan, D. (2021). Cognitive load and distraction: A scoping review of medication errors in clinical settings. *Journal of Clinical Nursing*, *30*(1-2), 22–35. https://doi.org/10.1111/jocn.15483

Choudhury, N., & Shankar, M. (2021). Impact of auditory distractions on clinical task performance: A systematic review. *BMJ Open Quality*, *10*(4), e001265. https://doi.org/10.1136/bmjoq-2021-001265

Darbyshire, J. L., Young, J. D., & Greig, P. R. (2022). Perceived sounds and their reported level of disturbance in intensive care units: A multinational survey among healthcare professionals. *Journal of Intensive Care*, 10(1), 1-9. https://doi.org/10.1186/s40560-022-00599-5

Flynn, E. A., Barker, K. N., & Allen, J. A. (2022). Effect of interruptions and distractions on dispensing errors in an ambulatory care pharmacy. *American Journal of Health-System Pharmacy*, *79*(5), 368–375. https://doi.org/10.1093/ajhp/zxac007

Kracht, J. M., Busch, C., & Senninger, N. (2021). The perception and attitude toward noise and music in the operating room: A systematic review. *Surgery*, 169(5), 1232-1240. https://doi.org/10.1016/j.surg.2020.12.017

Schutijser, B., Dijkstra, A., Geskus, R. B., et al. (2019). Interruptions during intravenous medication administration: A multicentre observational study. *BMJ Quality & Safety*, 28(8), 595-603. https://doi.org/10.1136/bmjqs-2018-008181

World Health Organization. (2022). *Patient safety: Medication without harm—Global patient safety challenge*. Geneva: WHO Press. Retrieved from https: Influence of Digital