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Research Article

Assessment of Frontline Health Workers' Capacity for Mpox Case Identification in Emergency Departments of Benin

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Abstract

Introduction. Monkeypox (MPOX) was declared a Public Health Emergency of International Concern (PHEIC) in 2022. In Benin, early identification of suspected cases by Frontline Health Workers (FHWs) in Emergency Departments (ED) is vital to stopping the chain of transmission and preventing community and nosocomial spread. This study aimed to assess the capacity of FHWs to identify Mpox in three strategic hospital facilities in Benin. Methods. We conducted a cross-sectional descriptive study with a qualitative component from February to May 2025 in three hospitals (Oueme Plateau Departmental Hospital Center, Zou Departmental Hospital Center, and Save Zone Hospital). A total of 43 FHWs (physicians, nurses, midwives, nursing assistants) were selected using a non-probability purposive sampling technique. Data on knowledge, attitudes, and practices (KAP) were collected via semi-structured interviews and analyzed using descriptive statistics. Institutional Standard Operating Procedures (SOPs) were assessed via document review. Results. The majority of participants were nurses (34.9%), with an average emergency department seniority of 4.1 years. Overall, 83.7% of staff demonstrated "good" theoretical knowledge for identifying suspected cases. However, only 65.1% explicitly identified sexual transmission as a route of infection, with a notable disparity between physicians (90%) and nursing assistants (37.5%). While risk perception was high (93.0%), only 55.8% trusted the hospital's isolation capacity, and 58.1% reported constant Personal Protective Equipment (PPE) availability. Discrepancies were found in institutional preparedness, with one hospital lacking updated SOPs. Conclusion. Frontline healthcare workers have a high theoretical ability to identify MPOX, but operational capacity is hindered by logistical challenges and gaps in knowledge regarding sexual transmission among non-medical staff. Limitations include the small sample size.

Keywords

MPOX, frontline Healthcare Workers, Emergency Department, Benin

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1. Introduction

Monkeypox (Mpox), a viral zoonosis caused by the Orthopoxvirus, is traditionally endemic in parts of Central and West Africa [1]. However, the emergence of a multi-country outbreak in 2022, marked by rapid human-to-human transmission [2] and new epidemiological patterns—specifically through intimate and sexual contact [3]—has transformed this disease into a Public Health Emergency of International Concern (PHEIC) [4].

In Africa, where the disease has circulated for decades [5], the global resurgence requires a critical reassessment of local response capacities [6]. Benin is particularly susceptible to epidemic shocks due to its geographical location and annual reports on epidemic-prone diseases [7]. While cross-border traffic poses a general risk for disease importation [8], the specific challenge for Mpox lies in the ability of health systems to detect cases before they spread in the community [9].

Emergency Department (ED) professionals are the "gatekeepers" of the health system [10]. They are exposed to patients presenting with nonspecific symptoms before the onset of the characteristic rash. Their ability to differentiate Mpox from chickenpox or measles—common endemic diseases in Benin—based on national management directives [11] is a determining factor in breaking the transmission chain [12]. Furthermore, the risk of nosocomial transmission is substantial; insufficient knowledge can endanger staff [13] and turn hospitals into infection clusters [14]. Strengthening West African health systems [15] and improving referral-evacuation systems [16] remain vital for regional security.

2. Materials and Methods

2.1. Study Design and Setting

This was a cross-sectional descriptive study incorporating a qualitative component [17]. It was conducted over four months (February to May 2025) in three hospitals selected for their strategic location: Oueme Plateau Departmental Hospital Center, Zou Departmental Hospital Center, and Save Zone Hospital.

2.2. Study Population and Sampling

The study population consisted of FHWs working in the reception and Emergency Departments (EDs). We employed a non-probability purposive sampling technique.

- Inclusion Criteria: Physicians, nurses, midwives, and nursing assistants physically present and working in the ED during the data collection period who consented to participate.
- Exclusion Criteria: Administrative staff, interns with less than 3 months of experience, and staff on leave. A total sample size of n=43 health workers was obtained. This size was determined by the saturation of the workforce available in these specific emergency units during the study window.

2.3. Data Collection

Data were collected using two approaches:

KAP Questionnaire: A semi-structured questionnaire was administered face-to-face. The tool was developed based on World Health Organization (WHO) guidelines. The tool integrated Emergency Triage Assessment and Treatment (ETAT) standards for frontline workers [18] and pre-tested on 5 health workers in a non-participating hospital to ensure clarity and validity. It covered socio-professional profiles, theoretical knowledge (symptoms, transmission), attitudes (risk perception), and practices.

Scoring System: Knowledge was assessed using a scoring grid where each correct answer (e.g., identifying "rash" or "sexual transmission") was awarded 1 point. A total score of ≥80% was categorized as "Good Knowledge," while <80% was categorized as "Insufficient."

Document analysis was performed using a review grid to assess the presence and revision of Standard Operating Procedures (SOPs) and infectious disease protocols [19].

2.4. Data Analysis

1) Quantitative Analysis: Data were analyzed using descriptive statistics (frequencies, percentages, means, and standard deviations). Cross-tabulations were used to compare knowledge levels across professional categories (e.g., physicians vs. nurses).
2) Qualitative Analysis: Verbatim statements regarding practices and barriers were recorded. These were analyzed using thematic content analysis to identify key themes related to logistical gaps and fear of infection [20].

2.5. Ethics

The study obtained ethical clearance (No. 018/24-71/2025) from the Ethics Committee of the Faculty of Health Sciences. Informed consent was obtained from all participants.

3. Results

3.1. Socio-professional Profile

The study included 43 health workers. The majority (34.9%) were nurses, followed by midwives and physicians (Figure 1). The overall average length of service was 8.5 years (SD: 3.2).

The specific seniority in the emergency department was 4.1 years (SD: 1.8). Women predominated (55.8%).

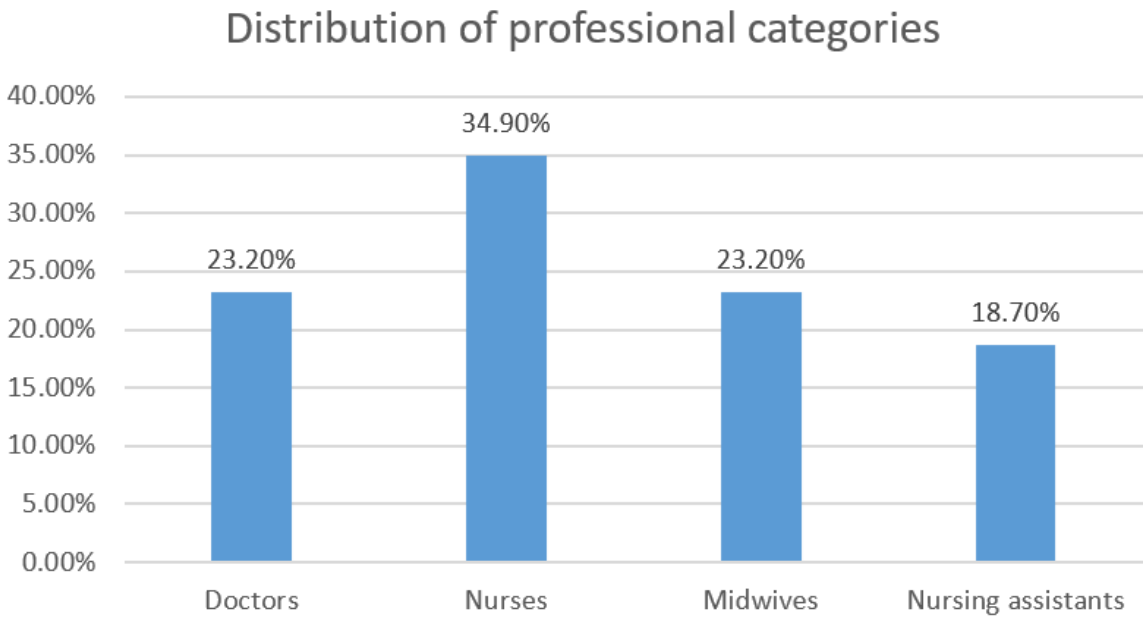

Figure 1. *Distribution of Professional Categories.*

3.2. Symptom Knowledge and Identification Ability

The assessment revealed a high level of theoretical knowledge. Overall, 83.7% (36/43) of workers obtained a good knowledge score. As shown in Table 1, vesicular rash (90.7%) and lymphadenopathy (86.0%) were widely recognized as key signs.

Table 1. *Correct Identification of Main Mpox Symptoms by Health Workers (N=43).*

Key Mpox Symptom	Workers Who Identified It (n)	Percentage (%)
Vesicular/pustular skin rash	39	90.7
Lymphadenopathy	37	86.0
Fever and headache	34	79.1

3.3. Knowledge of Transmission Modes

While direct contact was identified by 97.7% of participants (Table 2), knowledge of sexual transmission was lower (65.1%).

Table 2. *Correct Identification of Mpox Transmission Modes (N=43).*

Mode of Transmission	Workers Who Identified It (n)	Percentage (%)
Direct contact with lesions	42	97.7
Respiratory droplets	35	81.4
Contaminated fomites	30	69.8
Sexual transmission	28	65.1

A significant disparity was observed between professional categories (Table 3). Physicians were more likely to identify sexual transmission (90.0%) compared to nursing assistants (37.5%).

Table 3. *Identification of Sexual Transmission by Professional Category.*

Professional Category	Total (n)	Identified Sexual Transmission n (%)	Did Not Identify n (%)
Doctors	10	9 (90.0)	1 (10.0)
Nurses	15	9 (60.0)	6 (40.0)
Midwives	10	6 (60.0)	4 (40.0)
Nursing Assistants	8	3 (37.5)	5 (62.5)
Total	43	28 (65.1)	15 (34.9)

3.4. Attitudes and Risk Perception

Perception of the epidemic threat was high (93.0%), yet confidence in institutional capacity was low. Only 55.8% of participants trusted the hospital's ability to isolate cases effectively. Figure 2 illustrates that over 60% of staff reported a significant fear of nosocomial contamination (Figure 2).

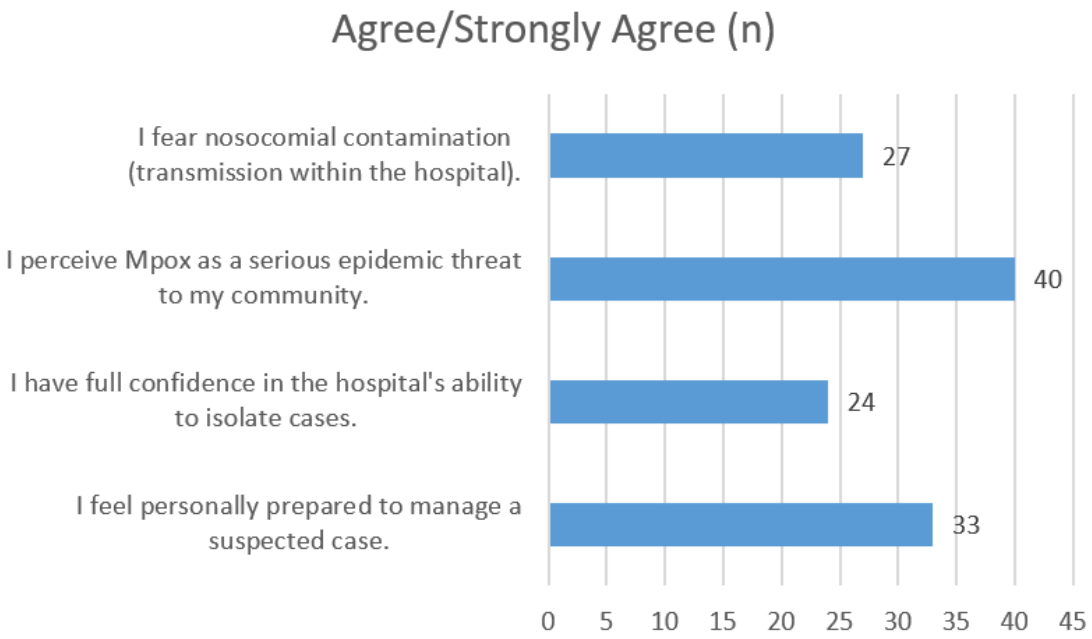

Figure 2. *Attitudes and Perceptions regarding Mpox.*

3.5. Practices and Institutional Procedures

While 74.4% of staff could describe the correct isolation procedure, practical adherence was hindered by logistics. Only 58.1% of staff reported that PPE was constantly available.

Document analysis showed that the Ouémé Plateau and Zou CHDs had updated SOPs in 2024.

4. Discussion

The objective of this study was to assess the capacity of Mpox identification among frontline health workers in Benin. The results revealed a high capacity for knowledge and identification, with 83.7% of FHWs demonstrating good theoretical skills. This performance is encouraging and higher than observed in other countries of the sub-region [21] or

specifically among health workers in other Benin-based reports [22].

The surveyed subjects were able to establish a clinical differential diagnosis through the presence or absence of lymphadenopathy. In its classic form, Mpox resembles chickenpox or measles, which are endemic in Benin. Citing lymphadenopathy as a differential criterion is a positive element for proper notification and alerting. Furthermore, general and specific seniority in emergency services are assets in the performance of health workers. This is also a result of the various training courses organized by the Ministry of Health following the WHO declaration.

However, weaknesses were noted regarding transmission modes. While physicians were more familiar with this mode, the 2022 outbreak revealed that rapid transmission occurred through prolonged intimate contact [23]. If triage does not account for this, atypical cases could be missed. This gap is consistent with findings in medical students within the region [24].

A divergence exists between high theoretical knowledge and lower practical confidence. A gap was observed between identification ability and the description of isolation practices, highlighting a gap between knowledge and operational know-how. This reflects broader challenges in the African epidemic response era [25]. Training must be modular and specific to the professional profile.

Healthcare workers expressed concern about nosocomial infection risks. A lack of personal protection increases transmission, potentially transforming the hospital into an infection cluster. Only 58.1% of staff perceive PPE as constantly available, corroborating the fear reported by participants.

Regarding normative organization, Africa CDC provides frameworks for harmonizing responses [26], yet the revision of SOPs remains an area for improvement [27]. To bridge the knowledge-practice gap, simulation exercises are recommended [28].

Finally, confirming suspected cases requires reliable laboratory support such as specific serologic assays [29], and management must always adhere to strict isolation precautions to prevent nosocomial spread [30].

Limitations

First, the sample size (n=43) is small, which limits the power of statistical associations. Second, the purposive sampling method limits the generalizability of findings to all hospitals in Benin. Finally, the practice component was self-reported and not observed directly, which may introduce social desirability bias.

5. Conclusion

Frontline health workers in Benin's emergency departments possess a strong theoretical foundation for identifying Mpox, particularly regarding classical symptoms. However, critical gaps remain in the recognition of sexual transmission among lower-cadre staff and in the availability of logistical resources. To bridge the gap between theory and practice, we recommend:

1) Targeted Training: Specific modules for nursing assistants focusing on new transmission modes (sexual contact).
2) Simulation Exercises: shifting from lecture-based training to functional drills to build confidence.
3) Logistical Security: Ensuring a visible and consistent supply of PPE in Emergency Departments to reduce staff anxiety.
4) Standardization: Urgent updating and distribution of harmonized SOPs to all peripheral hospitals.

Abbreviations

CDC	Centers for Disease Control and Prevention
ED	Emergency Department
ETAT	Emergency Triage Assessment and Treatment
FHW	Frontline Health Worker
IPC	Infection Prevention and Control
KAP	Knowledge, Attitudes, and Practices
PHEIC	Public Health Emergency of International Concern
PPE	Personal Protective Equipment
SOP	Standard Operating Procedure
WHO	World Health Organization

Author Contributions

Padonou Sètondji Geraud Romeo: Conceptualization, Formal Analysis, Investigation, Methodology, Supervision, Validation, Writing – original draft, Writing – review & editing

Mikponhoue Rose: Conceptualization, Formal Analysis, Investigation, Methodology, Supervision, Validation, Writing – original draft, Writing – review & editing

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Olofindji Jennifer: Investigation, Supervision, Writing – original draft

Aguemon Badirou: Conceptualization, Supervision, Validation, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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