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Knowledge attitude and practices toward mpox among healthcare workers in Kasese and Mayuge districts, Uganda, August-September, 2024

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Summary

Background: On August 2, 2024, Ministry of Health reported two confirmed cases of mpox in Kasese District and the disease has continued to spread to other districts including Mayuge, with a cumulative count of 5 confirmed cases and no death. We assessed the knowledge, attitude, and practices (KAP) among healthcare workers (HCW's) about mpox to inform control and prevention interventions.
Methods: We conducted a cross-sectional study among 339 HCW's from selected health facilities in Kasese and Mayuge districts, August 1–September 30, 2024. We collected data using a pre-tested self-administered questionnaire. Bloom's cut-off ≥80%, 79%-50%, and 49% and below was used to determine adequate knowledge, positive attitude, and good practices toward mpox.
Results: Out of 339 HCW's, 215 (63%) were female, 253 (75%) were in 18-35 age group, 202 (60%) had adequate knowledge of mpox, 295 (87%) had heard information about mpox, 211 (62%) were aware of the ongoing mpox outbreak in Uganda and 268 (79%) knew mpox is a viral infection. Most, 165 (50%) listed fellow HCW as the source of health information on mpox. Majority, 300 (88%) had not received training in mpox, and 296 (87%) did not know its incubation period. The majority, 270 (80%) had positive attitude toward mpox, 313 (95%) agreed that they should go to the health facility once they start presenting with mpox symptoms and 286 (88%) agreed that mpox is a serious disease with increased infection by direct contact with infected persons. The majority of HCW's, 300 (88%) had poor mpox practices.
Conclusion: HCW's had adequate knowledge and a positive attitude toward mpox which showed an opportunity for improvement in their practices which were generally poor. Majority had not received training and had no case definitions at health facility. We recommended training and provision of mpox information education communication materials to enlighten HCW's knowledge on mpox during surveillance, response and management.

Background

Mpox, previously known as Monkeypox is an infectious disease caused by the monkeypox virus, it is a viral infection, zoonotic in nature(1). It causes mortality, case fatality rate 0.2%(283/129,172) among people of all ages through direct contact acquired naturally via skin, mucous membrane and respiratory tract once exposed or in direct physical contact with infected individuals, contaminated materials, or infected animals (2) (3) (4). The pathogenesis and clinical presentation of Mpox depend on the route of infectious exposure, the dose, the strain of MPXV, and immune system of the host among others (4). To date, there are still significant uncertainties about the main transmission routes of mpox, reservoirs, transmissibility, severity, and natural history requiring for more studies on the disease.

Mpox signs and symptoms usually begin within a week but can also start 2–21 days after exposure, lasting up to 2–4 weeks but may last longer among high risk people especially the immunocompromised persons (5) (3). Mpox case fatality may range between 1% - 10% depending on the type of clade and some of the severe complications include: pneumonitis and encephalitis. Clinical characteristics of mpox vary but include: fever, rashes, lymphadenopathy, headache, malaise, fatigue, anal, genital and oropharyngeal lesions (6). A patient will remain infective until the lesions are crusted over, fallen off or dried (7). Treatment of mpox is mainly through supportive care although treatments like oral tecovirimat have been used in clinical trials and other countries (8) (9). The laboratory confirmation of Mpox is done by testing skin lesion material, oropharyngeal, genital, rectal, urine, semen, saliva for polymerase chain reaction (PCR) confirmation of MPXV infection by detection of unique sequences of viral DNA by real-time polymerase chain reaction (RT-PCR) and/or sequencing (10).

On August 14, 2024, as a result of the upsurge in mpox cases and increased mortality around the world, World Health Organization (WHO) declared mpox a Public Health Emergency of International Concern (PHEIC) a day after Africa Centers for Disease Control and Prevention (CDC) had declared it a Public Health Emergency (PHE) of continental security (17). On July 24, 2024, the Ministry of Health (MoH) Uganda reported two confirmed cases of mpox in Kasese District (18). Subsequently, Uganda reported a case in Mayuge District and more case in other districts. We assessed the knowledge, attitude, and practices among healthcare workers, Uganda, Kasese and Mayuge districts, August–September 2024, to inform control and prevention measures.

Methods

Study design and setting: We conducted a cross-sectional study from August 1–September 30, 2024 among HCW's working at selected health facilities in Kasese and Mayuge districts. At the time of this study, the selected health facilities had either registered an mpox confirmed, suspect case or treated an mpox patient
Study population and sample size: We conducted the study among 384 healthcare workers (Sample size determined using the Cochran's sample size formula) on a day

shift: medical doctors, nurses, midwives, laboratory assistants, laboratory technologist, and interns directly involved in the provision of healthcare service. Healthcare workers who were present on the day shift, directly involved in care of patients, and willingly volunteered to participate in the study were included.

Data collection and study variables: We collected data on socio-demographic characteristics of HCW's, and knowledge, attitudes, and practices on mpox using a self-administered, structured questionnaire based on previous studies on infectious disease outbreaks: COVID-19 and Ebola and the standard WHO guidance on prevention and control of mpox (19) (20). We collected data about socio-demographic characteristics, mpox incubation period, signs and symptoms of mpox, knowledge on mpox vaccine, causative agent, prevention methods, mode of transmission, treatment methods, mpox case definition, type of distribution of mpox rashes, knowledge of ongoing mpox outbreak in Uganda, training on mpox and source of information on mpox. Others included: severity of mpox, infection prevention and control, training and mentoring others and supervision. Having adequate knowledge was defined for a healthcare worker scoring above the mean value of the knowledge questions. Poor knowledge was defined for a healthcare worker who scored below the mean value of the knowledge questions. Positive attitude was defined for a healthcare worker who scored above or equal to the mean value of the attitude questions and having a negative attitude was defined for a healthcare worker who scored below or equal to the mean value of the attitude questions.

Data management and analysis: Data were extracted from the electronic kobo collect tool, cleaned in Microsoft excel and analyzed using Epi Info and STATA. Frequency distribution was performed for categorical variables and were expressed in numbers and percentages. For the 7 knowledge questions, "yes" was indicated as a correct answer and scored 1, and "no or don't know" answers were scored 0. The scores were added to give a total knowledge score that ranges from 0 to 7. HCW's overall knowledge was determined using modified Bloom's cut-off point, adequate knowledge score was between 80% and above (10-15 points) and 79% to 50% for moderate knowledge (5-9 points) and 49% below (0–4 points) for poor knowledge. Regarding attitude, the 7 questions were scored on a 3-point Likert scale (disagree, agree and don't know). The responses were scored 1 for disagree, 2 for agree and 0 for don't know or non-response. The cumulative score for all 7 questions were 0–14 points per HCW's. Overall attitude was categorized, using Bloom's cut-off point, HCW's had a positive mpox attitude if they scored ≥80% (10-14 points) and poor or negative mpox attitude if the scored 79% and below (0-9 points). The 6 practices questions were assessed as yes, no, don't know and non-response. "yes" was indicated as a correct answer and scored 1, while "no, don't know and non-response" answers were scored 0. Multiple responses were allowed. The cumulative score for all 6 questions ranged from 0 to 6 points for each participant. Overall practice level was similarly categorized using Bloom's cut-off point of ≥80% (4 above points) to determine good practice and poor practice if the score was between 79% and below (0-3).

Ethical considerations and consent to participate: The MoH of Uganda through the office of the Director General Health Services gave the administrative clearance to carry out this investigation. We obtained informed consent before start of interviews. Data was anonymized. We stored the collected data set in a password-protected computer and only shared it with the investigation team. US CDC additionally cleared this project as non-research with intent to improve public health.

Results

Socio-demographic characteristics of study participants

Of the 426 participants recruited and given questionnaires, only 339 HCW completed the questionnaire with a response rate of 80%. Majority of the HCW's were female 215 (63%), 149 (44%) were married and 199 (61%) had a certificate as the highest level of education. Most of the participants, 157 (47%) were aged 18-28 years, and the mean age of participants was 30.9 (SD ± 9.3) and median 29 years. Nurses were the most respondents 129 (38%) followed by midwives 60 (18%), and 184 (60%) of the HCW's had been in health service for <5 years (Table 1).

Table 1: Social demographic characteristics of healthcare workers, Uganda, Kasese and Mayuge district, Uganda, August–September, 2024

Characteristic	Freq (n=339)	Percent (%)
Age (yrs.)		
18-35	253	75
>=36	86	25
Sex		
Male	124	37
Female	215	63
Marital Status		
Divorced	15	4.4
Married	149	44
Never married	89	26
Separated	6	1.8
Single	75	22
Widow	5	1.5
Level of Education		
Masters	10	3.1
Bachelors	25	7.7
Diploma	92	28
Certificate	199	61
Designation		
Nurses	129	38
Midwife	60	18
Laboratory staff	31	9.1
Medical doctor	41	12
Clinicians	23	6.8
Pharmacist/Dispenser	6	1.8
Radiographer	2	0.6
Others	47	14
Years in health service (n=307)		
<5	184	60
5-10	62	20
>10	61	20

Knowledge toward mpox among healthcare workers, Kasese and Mayuge district, Uganda, August–September, 2024

Of the 339 HCW's who responded to the questionnaire, 202 (60%) had adequate knowledge of mpox. The majority of HCW's, 295 (87%) had heard information about mpox, 128 (62%) were aware of the ongoing Mpox outbreak in Uganda, and 268 (79%) knew that mpox is a viral infection. Most of the respondents 165 (50%) listed fellow health workers as sources of health information especially on mpox. The majority 268 (79%) knew the causative agent of mpox and only 39 (11%) were working at health facilities that had registered an mpox case. However, 300 (86%) of the HCW's had not received any training in mpox, and 296 (87%) did not know the incubation period of mpox. The main sources of information for HCW's included: health facility 165 (50%), followed by radio 140 (43%) and fellow HCW's 136 (42%).

Attitude toward mpox among healthcare workers, Kasese and Mayuge district, Uganda, August–September, 2024

Overall, 270 (80%) of the participants scored 80% and above, and were categorized as having a positive mpox attitude. The majority of the participants 313 (95%) agreed that they should go to the health facility once they start presenting with mpox signs and symptoms. The majority of the HCW 286 (88%) agreed that mpox is a serious disease that could cause death, and 288 (88%) agreed that infection can increase by direct contact with an infected person (Table 2).

Table 2: Attitude toward mpox among healthcare workers in Kasese and Mayuge district, Uganda, August–September, 2024

Questions (n=339)	Agree n (%)	Disagree n (%)	Don't know n (%)
Mpox is a serious disease	286 (88)	9 (2.1)	30 (9.2)
Mpox disease does not lead to death	57 (17)	220 (67)	52 (16)
Wearing PPE would not protect me from the mpox virus	77 (23)	208 (63)	44 (13)
Hand wash could protect me from the mpox virus	252 (77)	39 (12)	37 (11)
I should go to hospital if I have mpox signs and symptoms	313 (95)	4 (1.2)	12 (3.7)
Mpox infection can increase by overcrowding	279 (85)	11 (3.4)	38 (12)
Mpox infection can increase by direct contact with an infected person	288 (88)	4 (1.2)	35 (11)

Practices toward mpox among healthcare workers in Kasese and Mayuge district, Uganda, August–September, 2024

Overall, 300 (88%) of HCW's had poor mpox practices. The majority of the HCW's 290 (85%) knew the methods on how to protect themselves and others in case they got infected with mpox: wearing the necessary personal protective gear, isolating themselves, disinfecting contaminated surfaces (Table 3). However, majority of them 300 (88%) have not been trained or mentored on different aspects of mpox: mode of transmission, treatment, signs and symptoms, incubation period, causative agent. At health facility, 293 (86%) of the HCW's reported not having or distributed mpox information education materials (IEC).

Table 3: Practices toward mpox among healthcare workers in Kasese and Mayuge district, Uganda, August–September, 2024

Questions (n=339)	Correct n (%)	Incorrect n (%)
What is the first thing you would do if you suspected an mpox case here at the HF?	325 (96)	14 (4.1)
How do you protect yourself and other HCW's from getting infected with mpox?	321 (95)	18 (5.3)
Have you offered any training or mentorship to other health workers on mpox?	39 (12)	300 (89)
Have you done any supervision and preparedness activities for surveillance of mpox at your HF or community?	43 (13)	296 (86)
Have you distributed any mpox IEC materials?	46 (14)	293 (86)
Have you treated or taken care of any mpox patient here at the health facility in the past few weeks?	7 (2.1)	332 (98)

Discussion

The majority of healthcare workers had adequate knowledge toward mpox, majority were aware of the ongoing mpox outbreak in Uganda, and the causative agent of mpox. Most of the respondents listed fellow health workers as their sources of health information especially on mpox. The main sources of information for HCW's was: health facility, followed by radio and obtaining information from fellow HCW's. However, majority of the HCW's had not received any training in mpox, did not have case definitions at the health facility, and did not know the incubation period of mpox. The majority of HCW's had positive attitude toward mpox, agreed that they would go to the health facility once they started presenting with mpox signs and symptoms, agreed that mpox is a serious disease that could cause death, and that the infection can increase by direct contact with an infected person. However, majority of the HCW's had poor mpox practices: neither were they trained or mentored on mpox nor did they have mpox information education materials.

In this study majority of the HCW's had adequate knowledge. This finding can be attributed to the awareness of mpox created by MoH both health and community level given the ongoing mpox outbreak in the country. The early outbreak in districts like Kasese allowed HCW's to educate themselves on what needed to be done in case they got infected or registered a case at the healthcare workers. Although 60% of them had good knowledge, the number still seems low considering HCW's should be equipped with knowledge on a number of diseases. This finding is similar to those in China where 91% of medical workers had good knowledge of mpox but the true number of those who were knowledgeable was actually less and 64% of HCW 'sin Algeria with medium knowledge (21) (22). Other countries that have conducted similar studies have reported lower percentages of good knowledge of mpox among health workers: in Saudi Arabia

48%, Nepal 53% and Lebanese 33% (23) (24). The differences in these studies can also be associated to differences in study setting, perceptions, severity, and study period of mpox.

This study revealed positive attitude toward mpox among HCW's. HCW's are called to service even when spread of the disease under surveillance puts their lives at risk. A positive attitude during an outbreak among HCW's goes a long way in reducing transmission of Mpox but nosocomial infections in general. Our findings are in agreement with a study conducted in Uganda among HCW's who had 78% positive attitude toward COVID-19 (25). Their study highlighted an improvement in attitudes among HCW's who went on to learn more about COVID-19 as the outbreak evolved. Other studies show relatively low positive attitudes of Mpox among HCW's: Nepalese 51% and 30% among the general public in Lebanon (24) (26).

Although most HCW's had poor mpox practices, they knew the different methods of prevention against mpox. This practice is highly expected of them given that control and mitigation of transmission of any disease begins with them. However, these findings are contrary to a study in Uganda which found that HCW's had poor COVID-19 prevention methods and overall only 37% of them had good practices (25). The study highlighted that HCW's continued to gathered in common places knowing very well that this exposed them to COVID-19 at the time (25).

Study limitations: The self-reported approach of responses creates social desirability bias among respondents which we suspect could have also happened in this study. In addition, inherent limitations of the cross-sectional studies cannot be avoided given that snapshot description of knowledge and attitude among HCW's can change over time as outbreaks or interventions unfolds.

Conclusion: Healthcare workers had adequate knowledge and a positive attitude toward mpox which showed an opportunity for improvement in their practices which were generally poor. Majority had not received training and had no case definitions at health facility. We recommended training and provision of mpox information education communication materials to enlighten HCW's knowledge on mpox during surveillance, response and management.

Competing interest: The authors declared no conflict of Interest

Author contribution: JOK: Participated in the conception, design, analysis, and interpretation of the study results, drafted the bulletin; EM participated in data analysis; HK, JN, DW participated in data collection; RM, supervised the outbreak investigation, reviewed the report and bulletin for intellectual content; PE, HTN, SL, ME, BK, ARA reviewed bulletin draft for intellectual content and scientific integrity.

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