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The Marburg virus disease in Ghana: psychological impact of quarantine on health workers in the Adansi-North district

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Abstract

Background This study aimed to explore the psychological impact of quarantine on health workers during the outbreak of the Marburg disease. The study also explored the coping strategies adopted during the period of quarantine.

Methods The study uses a qualitative research approach and a purposive sampling procedure to recruit healthcare workers who were quarantined due to their exposure to patients infected with Marburg virus disease for in-depth interviews. The interviews were conducted using a semi-structured interview guide. The study was conducted in one facility in the Adansi-North district. The data collected was transcribed and analyzed thematically.

Results Most of the participants reported symptoms of psychological distress such as anxiety and fear as well as sleep disturbances during the period of quarantine. After the quarantine period, health workers adopted some behavioral changes such as frequent handwashing, wearing of nose masks and examination gloves. Some coping strategies adopted by the respondents during the period of quarantine include communicating with family and friends, cooking and watching television.

Conclusion The findings of the study are important for policy development, especially in the area of providing access to mental health services during and after quarantine by health facilities in which healthcare professionals work. Health workers who are not quarantined should be encouraged to check on their quarantined colleagues and not stigmatize such individuals.

Keywords Quarantine, Marburg virus disease, Psychological, Health workers, Impact

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Introduction

Marburg virus disease (MVD) is an infectious disease caused by the Marburg virus, a member of the filovirus family [1]. The disease was first discovered in Marburg and Frankfurt when the outbreak of hemorrhagic fever occurred among laboratory workers in 1967 [2]. The Marburg virus disease has a high case fatality rate which ranges from 32 to 90% [1, 3]. Approximately 643 cases of MVD have been detected in several countries since the first outbreak of the disease [4]. The worst affected countries were Angola and the Democratic Republic of Congo with 374 and 154 cases detected respectively [4, 5]. Symptoms of Marburg disease include nausea, malaise, headache, diarrhea, vomiting, fever, bleeding from body openings and death occurring in some cases [6, 7]. The virus is initially transmitted to humans from bats and subsequently spreads from person to person through direct contact with a symptomatic individual [8].

To prevent the spread of the virus, individuals who are ill and test positive for the virus are required to be isolated [9]. Additionally, persons who are not ill but may have been exposed to infected persons are also supposed to be quarantined to limit the spread of the disease [10]. Quarantine is often an unpleasant experience for persons who go through it due to separation from family and friends; uncertainty about disease status and loss of freedom [11].

Several studies have indicated that isolation and quarantine may psychologically impact individuals. For instance, a study conducted by Bai et al. [12] showed that hospital staff who were quarantined after having contact with patients infected with Severe Acute Respiratory Syndrome (SARS) and H1N1 were found to likely report anxiety when dealing with patients, insomnia, anger, poor concentration and work performance after the quarantine period. Similarly, Jassim et al. [13] indicated that individuals who were quarantined in line with the COVID-19 pandemic reported depression and psychological distress. In Saudi Arabia, a number of studies [14–16] have found depression, anxiety, and stress symptoms among quarantined persons. Other studies have reported behavioral changes such as frequent handwashing and avoidance of crowds after quarantine [17].

Ghana declared its first-ever outbreak of the Marburg disease on 17th July 2022 [5]. The cases were detected in the Ashanti region [18]. About 198 individuals including healthcare workers and members of communities were identified as contacts and consequently quarantined for 21 days [19]. Existing studies on Marburg disease in Ghana have focused on providing a general overview of the disease and measures put in place to mitigate its spread [5, 20]. Sah et al. [5] described where the MVD was initially detected and its spread across various countries including Ghana; mode of transmission and treatments available. Wellington et al. [20] on the other hand, provided information on MVD epidemiology and outbreak in Ghana and efforts put in place to mitigate the spread of the disease.

To the best of our knowledge, no study has explored the psychological impact of quarantine on healthcare workers who came in contact with patients infected with Marburg disease. Therefore, this study aimed to explore the psychological impact of quarantine on health workers during the outbreak of the Marburg disease. Specifically, the study sought to:

1. Explore healthcare workers' experiences of psychological distress during and after quarantine.
2. Explore the coping strategies used by health workers during quarantine.

Understanding the psychological impact of quarantine and coping strategies in connection with Marburg disease is important for research, policy and practice. In terms of research, findings from the study will add to the literature on Marburg disease and influence further studies on mental health interventions for healthcare professionals during disease outbreaks.

With regard to policy, evidence from this study can influence the development of policies to provide mental health support to healthcare workers during and after quarantine.

Further, exploring the psychological impact of quarantine helps healthcare managers to implement strategies (such as establishing peer support programs) to promote the psychological well-being of their staff.

Theoretical framework

The study is based on the stress and coping framework [21] which posits that a stress reaction occurs due to an imbalance between the perception of threat and the ability to cope with it. The theory argues that individuals continuously appraise stimuli within their environment and the process produces emotions. When an individual considers stimuli as threatening and harmful, the resulting distress generates coping strategies to manage the threatening stimuli [22]. The coping process produces an outcome that is reappraised as favorable, unfavorable, or unresolved. Positive emotions are elicited when a threatening stimulus is resolved favorably, whereas unresolved stressors cause distress and further induce an individual to consider other coping options [22].

According to Lazarus & Folkman [21], there are two forms of coping strategy which include problem-focused and emotional regulation coping strategies. The problem-focused strategy tries to remove the source of stress whereas the emotional regulation strategy focuses on

changing how an individual feels or thinks about a situation [23].

The stress and coping framework has been used to highlight how outbreaks of diseases such as the COVID-19 pandemic can cause negative and positive experiences, stress responses and subsequently influence the well-being of an individual [24–26]. It has been found that isolation and fear of contracting an infectious disease increased stress and anxiety during COVID-19 [26]. Similarly, Szkody et al. [27] indicated that isolation from social contacts increased COVID-19-related worries.

Methods

Study design

The study adopted a phenomenological qualitative research approach to explore the psychological impact of healthcare workers who were quarantined as a result of their exposure to patients infected with Marburg virus disease. The choice of phenomenology is based on the fact that it allows a researcher to study human experiences including how people perceive their lived and shared experiences [28]. The phenomenological qualitative approach was used to obtain an in-depth understanding of the experiences of the quarantined health workers.

Study area

The study was conducted in the Adansi-North district which is located in the Ashanti region. Adansi-North has Fomena as its capital. The district also has some major towns such as Dompoase, Asokwa junction, Tewobaabi, Fumso, Akrokerri, Kyekyewere, Nyankomasu, Aboabo and Nsokote [29]. About 50.5% of the population are females whilst the remaining are males. Approximately, 90% of the population is rural and more than half (75%) of the households in the district are engaged in agricultural activities [29]. The district has five [5] health facilities which include four [4] government-owned and one [1] mission-based facilities [30]. The district has one hundred and one (101) nurses, three [3] medical officers, six [6] physician assistants, and forty [40] midwives.

Sampling strategy and sample size

Purposive sampling was adopted for this study. According to Palinkas et al. [31], purposive sampling is used to select respondents who have adequate knowledge about a phenomenon or have experienced a phenomenon of interest. Hence, that approach was used to select healthcare workers who were quarantined as a result of exposure to individuals infected with the Marburg virus disease.

All ten [10] healthcare workers who were quarantined as a result of exposure to patients infected with the disease were interviewed. The participants of the study were recruited through the medical director of the health facility. The researchers contacted the medical director of the selected facility and explained the purpose of the study to him and also sent a copy of the ethical clearance of the study. The director then arranged for the interviews after obtaining the participants' consent. The sample size of the study was deemed appropriate as studies [32, 33] have recommended that phenomenological studies could be carried out with less than ten [10] individuals. The data from the 10 participants represented the entire population of quarantined individuals and hence, this completeness inherently achieved saturation because there were no other participants to potentially contribute new insights [28, 34].

Inclusion criteria

Only health workers quarantined as a result of their exposure to patients infected with Marburg Virus disease in the selected health facility were included in the study.

Exclusion criteria

The study excluded health workers who did not come into contact with the patients infected with Marburg virus disease in the selected health facility. Also, health workers in other health facilities in the district were excluded from the study.

Data collection and analysis

A semi-structured interview guide was used to collect relevant data from the participants. The interview guide was developed using information from literature sources [35–37] as a guide. Data collection was carried out between March and August 2023. The interview guide contained questions on the demographic characteristics of the participants, participants' experience during the quarantine period and the effect it had on them as well as coping strategies during the quarantine period. The interviews were conducted in English via Zoom and audio recorded. The recordings were compared with the notes that were taken to clarify any issue of ambiguity. Averagely, each interview lasted for 60 min. The responses to the interview questions were first transcribed verbatim, edited and thoroughly checked for completeness. Also, the transcripts were read through several times to determine the trend of the responses. The data was analysed using Braun and Clarke [38] thematic analysis. The researchers began by familiarizing themselves with the data to identify patterns. Next, codes were generated from the responses to the interview questions. The codes were then organized into themes in accordance with the objectives of the study. The authors reviewed the themes and the final set was agreed on. Finally, the findings of the study were reported using the derived themes.

Table 1 List of sub-themes from data

Themes	Sub-themes
Psychological effect of quarantine	Anxiety and Fear Sleep disorders Behavioral changes
Coping Strategies	Communication with friends and family Hobbies

Table 2 Socio-demographic characteristics of participants

Name	Profession	Age	Gender	Marital status
MD1	Medical Doctor 1	40	Male	Married
MD2	Medical Doctor 2	36	Male	Married
MD3	Medical Doctor 3	37	Male	Married
SNO	Senior Nursing Officer	37	Male	Married
NO1	Nursing Officer 1	35	Female	Single
NO2	Nursing Officer 2	32	Male	Single
NO3	Nursing Officer 3	30	Male	Married
EN1	Enrolled Nurse 1	25	Female	Married
EN2	Enrolled Nurse 2	26	Female	Single
EN3	Enrolled Nurse 3	28	Female	Single

Table 1 below shows the list of sub-themes that emerged from the data:

Credibility and trustworthiness

To achieve the trustworthiness of the study, Lincoln & Guba [39] criteria were followed. These criteria comprised credibility, dependability, confirmability and transferability. Peer debriefing where the lead investigator reviewed the transcripts and findings of the study to ascertain if a key point had been missed or a minor point had been overemphasized was adopted to ensure the study's credibility. Confirmability and dependability were achieved by using audit trails to list the steps used in the data analysis and the rationale for decisions made as far as the methodology was concerned. To ensure transferability, detailed accounts of the experiences of quarantined health workers in the context in which the Marburg virus disease was detected have been described.

Results

Demographic characteristics of respondents

Table 2 presents the demographic characteristics of the participants. Four (40%) of the health workers were aged 25–30 years, two (20%) were within 31–35 years and the remaining four (40%) were aged 36–40 years. Six (60%) participants were males and the remaining were females. Similarly, six [6] participants were married whilst the remaining were single. Most participants (70%) were nurses whilst the remaining were doctors.

Healthcare worker's experiences of psychological distress during and after quarantine

Anxiety and fear of contracting the virus

Out of the 10 participants who were interviewed, 6 of them mentioned that they experienced anxiety and fear during the period of quarantine. The participants who were mainly nurses indicated that they were afraid they would contract the virus which has no cure. It was observed from the responses that the nurses who experienced headaches within the quarantine period were scared that they might have contracted the Marburg Virus Disease. Additionally, one of the nurses took herbal supplements to boost her immunity against the virus and another also hoped that God would protect him from the virus.

A nurse asserted that.

"*I was really scared and I even called my father and he gave me COA mixture to boost my immune system. When I get a headache, I would wonder if it was the Marburg, and I was doing research about it.*" (EN1).

Another indicated,

"*When I am home and I start to feel headache, then I get scared asking if this is Marburg. But I believed in God that I will not get it.*" (NO2).

Another person recounted "*I was worried because I heard the virus had no cure…I was wondering what would happen to me if the worst happens.*" (NO3).

Another nurse mentioned that he was scared he would contract the virus because of his exposure to the blood sample of one of the infected patients. He explained:

"I was very scared because I had direct contact with one of the patients and blood splashed on my eye… so I thought I would contract the virus." (SNO).

Two of the doctors mentioned that even though they were in quarantine, they were sure they would not contract the Marburg Virus Disease because they were cautious when attending to the patients. They mentioned that because of their experience with COVID-19, they used personal protective equipment. This is captured by the responses below:

"I wore examination gloves and face masks when I attended to the patients who were found to have the virus. I took precautions so I was not scared because I knew I wouldn't get it". (MD2)

"I washed my hands immediately after attending to the patients and I didn't touch any part of my body.It was not likely for me to contract it so I wasn't anxious at all". (MD3)

Other participants had mixed feelings during the quarantine period. To them, the period also gave them the opportunity to rest. However, occasionally they worried they could contract the virus.

One nurse reported that,

"*The feeling was mixed for me, the first one is me resting… like not going to work, I was happy for that one and the other side that was bad for me is me knowing that I came in contact with the patient for that I wasn't happy about that, and I wasn't relating to my colleague and not calling my family that one wasn't good.*" (NO1).

Similarly, a doctor averred that "*Personally, I was at ease because I had the chance to rest. It's just a few times that I worried about getting the disease.*" (MD1).

Sleep disorders

The participants expressed diverse views on how their sleep was affected during the period of quarantine. Some participants indicated that their sleep patterns were affected negatively whilst others had no issue with it. Some reasons why some of the participants could not sleep include uncertainty about laboratory results and experience of symptoms that were suggestive of the Marburg viral infection. Also, participants who were anxious about contracting the virus had difficulty sleeping. These participants were mostly nurses who spent more time with the infected patients than the doctors.

For instance, a nurse mentioned that.

"*For the first five days, I couldn't sleep because you get this symptom…at times you get this abdominal pain, you get severe headache and you will think that's the symptom of the virus*" (EN1).

Two others said the following:

"*I was having insomnia. I was talking to a friend…. I told her I was uncomfortable because I was living alone and was not sure if I had contracted the virus or not*" (EN2).

"*My sleep was affected especially after the samples had been taken… l was expecting to hear the results whether the outcome will be positive or not… so from this period till that time. sleeping was not good. I will be wondering what the outcome is because I don't know the outcome once the patient has died before me so if it comes out positive what next, that's what I was thinking about.*"(SNO).

Another participant also mentioned that "*I will sleep and in the middle of the night and wake up and be thinking of all the signs and symptoms when I urinate, I check if there's blood and when I defecate, I check if there's blood before I flush so it wasn't easy*". (NO3)

Other participants indicated their sleep was not affected in any way. One doctor said, "*My sleep was not affected. It was an entire genuine rest*". (MD2)

A nurse also stated that "*We had to battle with the thoughts but my sleep was not affected*. (EN3)

Behavioural changes

Post-quarantine, most of the health workers became very cautious in dealing with patients and engaged in avoidance behaviours. Some of the participants mentioned that they frequently washed their hands than before the quarantine period. Others also made sure that they wore nose masks and gloves when attending to patients. Some participants felt that even though it wasn't comfortable wearing personal protective equipment like masks, it was necessary to use them to prevent the threat of death.

One participant mentioned, *"I was washing my hands after every procedure, wearing gloves, nose mask everywhere I go*" (NO3).

Another participant similarly stated that *"anytime I was going to a patient's bedside, I wear a nose mask, gloves, etc. to protect myself even though not comfortable. I thought to myself that if it has killed someone then it can also kill me so let me protect myself"* (SNO).

A physician asserted "*I am more cautious or protective than I used to be before*" (MD3).

Coping strategies during quarantine

Communicating with friends and family

More than half of the participants mentioned that interacting with friends and family via phone calls and social media (e.g. WhatsApp, facebook, and Instagram) helped them to endure the quarantine period. The interactions provided the opportunity for participants to receive encouragement from colleagues, family and friends to stay positive. Additionally, the use of social media for extended periods enabled participants to contact friends they hadn't interacted with for a long time.

One participant expressed.

"*I was talking to friends who were encouraging me a lot that nothing will happen to me and my nurse manager also encouraged me that even during COVID time I didn't get COVID so I shouldn't think of it*" (EN3).

Another participant said that "*I usually call my colleagues to find out if they are okay or are experiencing any symptoms*" (MD1).

For some others, they did not inform their close relatives about having contact with infected persons and being in quarantine. This decision was taken to prevent them from being overly worried.

One nurse revealed, "*Oh I know my parents would react so I decided to keep it to myself. But few friends that I was able to open up to, they call to check up and encourage me*"(EN2).

A doctor also mentioned that "*I didn't inform any of my family members except my wife because they will go through some trauma and… I wouldn't have slept if I had told my mother, brothers and sisters they would be calling every minute. so I didn't tell them I only told my wife because probably she might want to come around*" (MD3).

Another nurse stated "*I didn't tell my parents because they will not be able to take it well psychologically because they will come and see if it's really true*"(NO3).

Similarly, another nurse indicated "*My direct family members were not aware and I didn't tell them because I didn't want them to be anxious. I only told my priest who encouraged me"*(NO2).

Engagement in hobbies

Participants also mentioned that they engaged in other activities such as cooking, reading and watching television during the period of quarantine. These activities helped them to cope with the feeling of boredom.

A nurse recounted "*I was watching movies and reading. That was the only thing I was doing to keep my mind off"*(EN1).

Another nurse said that *"I was watching movies and cooking to keep me busy and prevent me from thinking"*(EN2).

A doctor also mentioned "*For me what I did was watching movies and sometimes I wanted to read to take my mind off but you might read something and it will take your mind to clinical issues so I decided to be watching movies like cartoons and others just to release stress*" (MD2).

Discussion

This study sought to qualitatively examine the psychological impact of quarantine due to exposure to the Marburg virus on health workers and the coping strategies utilized. The findings of the study suggest that healthcare workers who were quarantined as a result of exposure to patients infected with Marburg Virus disease experienced sleep disorders, anxiety and fear as well as behavioural changes such as frequent hand washing, wearing of nose masks and gloves. According to Lazarus & Folkman [21] theory of stress and coping, these reactions occurred as a result of appraisal of the quarantine situation and the unavailability of vaccines or medicines for treating the disease as life-threatening. This result is consistent with findings from other studies [14, 40] conducted in Senegal where anxiety was reported among quarantined individuals during the COVID-19 outbreak. Similarly, other qualitative studies [41–43] have also reported fear and insomnia due to quarantine. Another study also found that health workers who were quarantined during the COVID period were likely to experience anxiety and stress due to fear of infection [11]. Interestingly, even though most of the health workers were familiar with quarantine because of the recent COVID-19 experience, they still experienced some psychological distress. This could be attributed to poor knowledge about the disease and the absence of well-known treatments. It is therefore imperative to ensure that people under quarantine have a good understanding of the disease concerned to reduce the psychological impact on them. Also, the results highlight the need to offer psychological help to address the difficulties experienced during quarantine and post-quarantine periods. Findings from the study also showed that participants who experienced anxiety and fear were mainly nurses and this may likely be due to the increased contact time they had with the patients and their subsequent appraisal of the situation as a threat to their health.

Findings from the study also revealed that the health workers adopted strategies such as watching television, cooking, reading, and interacting with friends and family to cope with the psychological distress experienced during the quarantine period. These emotion-focused strategies may have been adopted after the participants appraised the situation and realized that they could do nothing to remove the source of their stress which was exposure to the infected patients [21]. However, they had the capacity to regulate their internal emotions and improve their psychological well-being by engaging in hobbies and other leisure activities.

The findings of the study corroborate the interaction with friends and family strategy mentioned by Paredes Ruvalcaba et al. [44] in a study to identify coping strategies to overcome the psychological stressors caused by the COVID-19 pandemic and subsequent lockdown. Similarly, Htay et al. [45] found that the interaction of health workers with family and friends via social media, watching television, reading, and cooking helped improve their psychological well-being during the COVID-19 pandemic. Even though social support can improve psychological well-being, some participants in this study indicated that they did not inform their close relatives to prevent them from being overly worried. This confirms the argument by Ogińska-Bulik [46] that sometimes social support exacerbates stress due to some families expressing their worries unreasonably.

Limitations of the study

Though the study provides invaluable evidence on the psychological effect of quarantine on health workers as well as coping mechanisms, it is not without limitations. Interviews were conducted via Zoom and hence, the exact emotions or how participants actually felt which could have been noticed via face-to-face interaction was missed. Also, poor network made it challenging to hear some of the words of the participants a few times. It is also important to note that the study was conducted in only health facility in Ghana which limits the generalisability of the findings. That notwithstanding, the findings from the study are important for policy formulation.

Conclusion

The findings of the study reveal that most health workers who were quarantined suffered from anxiety and fear as well as sleep disorders. Others also exhibited behavioural changes such as frequent handwashing and wearing of

masks after the period of quarantine. These findings are important for policy development, especially in the area of providing access to mental health services during and after quarantine by health facilities in which healthcare professionals work. Additionally, other health workers who are not quarantined should be encouraged to check on their quarantined colleagues and not stigmatize such individuals. Further, it is important to provide in-depth education on diseases of public health concern to reduce fear and anxiety when health workers are exposed to patients infected with such diseases.

Abbreviations

MVD Marburg Virus Disease
SARS Severe Acute Respiratory Syndrome

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Author contributions

G.A.A, G.A.O and H.K.N.A conceptualized and designed the study with inputs from all authors. L.O.A. and HD conducted the literature review whereas the methodology was designed by G.A.O. and H.K.N.A with comments from the rest of the authors for inclusion. Data collection instruments were developed by G.A.A., G.A.O. and H.K.N.A. but reviewed with comments provided by L.O.A. and H.D. to improve the instruments. Data collection was done by G.A.O. and H.N.K.A. The first draft of the manuscript was produced by G.A.O. and reviewed by the remaining authors to improve the manuscript. Final editing was done by H.N.K.A. and all authors have approved the final version for submission.

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Data availability

Data is provided within the manuscript file.

Declarations

Ethics approval and consent to participate

Ethical clearance for the study was obtained from the Ghana Health Service Institutional Review Board with the review number GHS-ERC 007/02/23. In addition to the Ethical clearance, informed consent was obtained from all the respondents after explaining the purpose of the study to them. Respondents were also informed that notwithstanding the consent given, they could withdraw from the study at any time.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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