

An evaluation of mental health integration in the neglected tropical diseases program in Zamfara, North-west Nigeria

Sunday Udo^a, Pius Sunday Ogbu^a, Paul A. Tsaku^{a,*} , Aliyu Tukur^b and Andrew NewMarch^c

^aLeprosy Mission Nigeria, 12/14 Kings Drive, Fort Royal Homes Estate, Lugbe, Abuja, Nigeria; ^bZamfara State Tuberculosis Buruli Ulcer, and Leprosy Control Programme, Gusau, Nigeria; ^cLeprosy Mission Australia, 37-39 Ellingworth Parade, Box Hill, VIC 3128 Australia

*Corresponding author: Tel: +234 (0) 7035 425 305; E-mail: tsakup@tlmnigeria.org

Received 10 May 2023; revised 18 August 2023; editorial decision 18 December 2023; accepted 9 January 2024

Background: Mental health and neglected tropical diseases (NTDs) are critical in healthcare systems, especially in low- and middle-income countries. Several policies are planned or designed by health stakeholders to address the mental health needs of people affected by NTDs. Still, the impact of such policies seems to be of no consequence.

Methods: The GAD-7 and PHQ-9 tools were used to determine the rate of depression and anxiety, respectively, among people affected by skin NTDs (leprosy and lymphatic filariasis [LF]) in Zamfara State, North-west Nigeria. The study also evaluated the barriers to the uptake of mental health services for people affected by skin NTDs in the state. We assessed 48 people affected by NTDs (leprosy, 32; lymphatic filariasis, 16) along with a corresponding 48 people who served as controls in the study. Qualitative interviews were carried out with the participants to elicit the barriers to mental health services for people affected by NTDs. Additionally, 48 selected healthcare workers from the state were assessed for their skills and capacity to offer mental health services.

Results: We found anxiety disorder present in 100% of the people living with LF and in 62% of the people living with leprosy. Depression was also found in 56% and 75% of the people living with leprosy and LF, respectively. An assessment of the barriers to the uptake of mental health services reveals that most people with NTDs are constrained by a lack of money to visit hospitals, the fear of stigmatisation and discrimination and long distances to health centres. Regarding the healthcare workers, the skills and capacity to offer mental health services were very low.

Conclusions: We conclude that for mental health services to be integrated into the community health system for people with NTDs, there should be a concerted effort by all stakeholders and the intervention should be context specific instead of generalised.

Contexte: La santé mentale et les maladies tropicales négligées (MTN) sont des problématiques centrales dans la santé, en particulier dans les pays à revenu faible ou intermédiaire. Plusieurs politiques sont conçues par les acteurs de la santé publique pour répondre aux besoins de soins en santé mentale pour les personnes touchées par les MTN. Pourtant, le bilan reste mitigé quant à l'efficacité de ces soins.

Méthodes: Les outils GAD-7 et PHQ-9 ont été utilisés pour déterminer le taux de dépression et d'anxiété chez les personnes atteintes de MTN cutanées (lèpre et filariose lymphatique) dans l'État de Zamfara, au nord-ouest du Nigeria. L'étude a également évalué les obstacles à l'utilisation des services de santé mentale pour les personnes atteintes de MTN cutanées dans l'État. Nous avons évalué 48 personnes atteintes de MTN (lèpre : 32, filariose lymphatique : 16) ainsi que 48 personnes correspondantes qui ont servi de témoins dans l'étude. Des entretiens qualitatifs ont été menés avec les participants afin d'identifier les obstacles aux services de santé mentale pour les personnes atteintes de MTN. En outre, 48 professionnels de la santé sélectionnés dans l'État ont été évalués pour déterminer leurs compétences et leur capacité à offrir des services de santé mentale.

Résultats: Nous avons trouvé des troubles anxieux chez 100% des personnes atteintes de filariose lymphatique et chez 62% des personnes atteintes de lèpre. La dépression touche 56% et 75% des personnes vivant avec la lèpre et la filariose lymphatique respectivement. Une évaluation des obstacles à l'utilisation des services de santé mentale révèle que la plupart des personnes atteintes de MTN sont limitées par le manque d'argent pour se rendre à l'hôpital, la peur de la stigmatisation et de la discrimination, et les longues distances à parcourir pour se rendre dans les centres de santé. Les compétences et les capacités des professionnels de la santé à offrir des services de santé mentale sont très faibles.

Conclusion: L'efficacité d'un protocole de soins pour les patients atteints de MTN (traitant la pathologie physique et d'éventuelles pathologies psychiatriques associées) nécessite une intégration des services de santé mentale dans le système de santé communautaire.

Antecedentes: La salud mental y las enfermedades tropicales desatendidas (ETDs), son fundamentales en los sistemas sanitarios, especialmente en los países de renta baja y media. Las partes interesadas en la sanidad planean o diseñan varias políticas para abordar las necesidades de salud mental de las personas afectadas por ETDs. Sin embargo, el impacto de dichas políticas parece ser nulo.

Métodos: Se utilizaron las herramientas GAD-7 y PHQ-9 para determinar la tasa de depresión y ansiedad, respectivamente, entre las personas afectadas por ETDs cutáneas (lepra y filariasis linfática) en el Estado de Zamfara, al noroeste de Nigeria. El estudio también evaluó las barreras para la aceptación de los servicios de salud mental por parte de las personas afectadas por ETDs cutáneas en el Estado. Se evaluó a 48 personas afectadas por ETDs (lepra: 32; filariasis linfática: 16) y a otras 48 que sirvieron de control en el estudio. Se llevaron a cabo entrevistas cualitativas con los participantes para determinar las barreras a los servicios de salud mental para las personas afectadas por ETDs. Además, se evaluaron las habilidades y la capacidad para ofrecer servicios de salud mental de 48 profesionales sanitarios del Estado.

Resultados: Encontramos trastorno de ansiedad presente en el 100% de las personas que vivían con filariasis linfática y en el 62% de las personas que vivían con lepra. También se encontró depresión en el 56% y el 75% de las personas que vivían con lepra y filariasis linfática respectivamente. Una evaluación de los obstáculos para la utilización de los servicios de salud mental revela que la mayoría de las personas con ETDs se ven limitadas por la falta de dinero para acudir a los hospitales, el miedo a la estigmatización, la discriminación y las largas distancias hasta los centros sanitarios. Por parte del personal sanitario, los conocimientos y la capacidad para ofrecer servicios de salud mental eran muy escasos.

Conclusiones: Para que los servicios de salud mental para personas con ETD se integren en el sistema sanitario comunitario, debe haber una concertación entre todas las partes interesadas y la intervención debe ser específica para cada contexto en lugar de generalizada.

Keywords: leprosy, lymphatic filariasis, mental health, neglected diseases, Nigeria.

Introduction

Leprosy (Hansen's disease) and lymphatic filariasis (LF) are included in the World Health Organization (WHO) list of neglected tropical diseases (NTDs).¹ NTDs are a set of chronic debilitating diseases commonly associated with the poorest individuals in low- and middle-income countries (LMICs).² The mental health status of people affected by NTDs has become an area of concern to the global health community because of the chronic, disabling and stigmatizing nature of the diseases and the poverty that is commonly associated with them.

Leprosy is caused by *Mycobacterium leprae* and it mainly affects the skin, the peripheral nerves, mucosal surfaces of the upper respiratory tract and eyes.³ The disease is curable with the use of an antibiotics combination called multidrug therapy (MDT) and disability can be prevented with early detection and treatment. However, for reasons associated with social and economic status, many cases are not detected early, which consequently results in

disfigurement, and patients (and their families) face stigma, social isolation and cataclysmic costs. Published data by the WHO indicates that 208 619 new cases of leprosy were recorded globally in 2018, with Nigeria accounting for 2098 of the reported cases.⁴

LF, also known as elephantiasis, is caused by nematodes (roundworms) belonging to the Filariodidea family and are transmitted through the bite of infected mosquitoes. LF is a painful and profoundly disfiguring disease that is characterized by visible manifestations such as lymphoedema (swelling of the leg or hand) and hydrocele (swelling of the scrotum), resulting in temporary or permanent disability with major socio-economic impacts. More than 120 million people in 72 countries throughout the tropics and subtropics are said to be affected by LF.⁵ In addition to the well-recognized physical disability associated with lymphoedema and hydrocele, affected people often experience rejection, stigma and discrimination. The resulting emotional consequences are known to impact quality of life and the

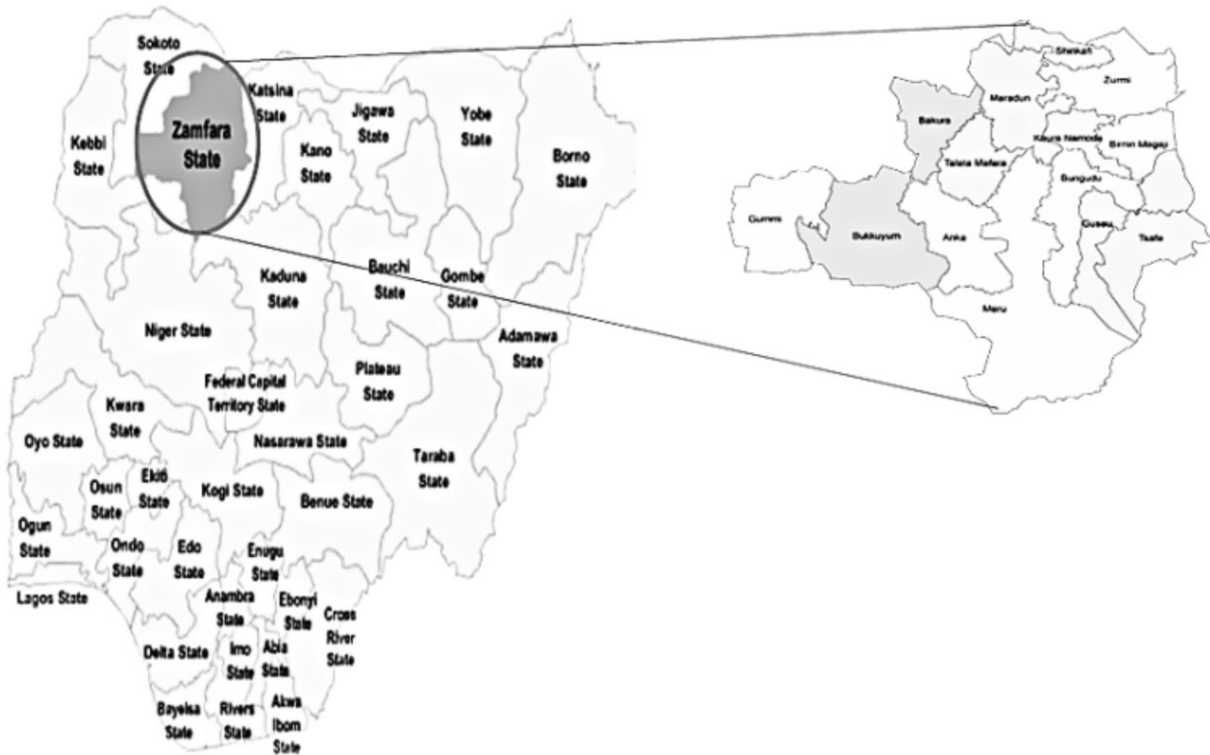


Figure 1. Map of Nigeria showing the location of Zamfara State, where the study was conducted. [Source: <https://paintmaps.com/map-charts/301/Nigeria-map-chart>]

functioning of the affected individuals. Despite the several consequences, including the mental health implications of LF, management of this condition has been focused on prevention and treatment through mass drug administration, with scant attention paid to the emotional impact of the condition on affected individuals.⁶

The mental health of people affected by skin NTDs is an important aspect of health that led the WHO to develop a guide titled 'Mental health of people with neglected tropical diseases—towards a person-centred approach' in 2020.⁷ However, health systems, especially in LMICs have not adequately responded to the mental health needs of people living with skin NTDs. More than 85% of people with severe mental health challenges in LMICs are reported to have no access to adequate treatment for their disorders and in most cases they face stigmatization and other societal discrimination.⁸ The Nigerian government has made declarations for the integration of disability and mental health in healthcare systems since the early 1990s, but these policies have not yet been fully implemented.^{9–11}

Zamfara State is located in North-west Nigeria with an estimated population of 4.1 million inhabitants.¹² Poverty and insecurity are prevalent in the state, leading to displacement of thousands of families to places including camps for internally displaced persons (IDPs) located in neighbouring states. Unfortunately, there is a dearth of information concerning disability, mental health and NTDs from the region. A handful of interven-

tions by local and international organisations have been channelled towards ameliorating these needs, but the impact is still negligible. It is on this premise that this research was conceived and designed to give insights into the burden of NTDs and mental health in Zamfara State, Nigeria.

The study was conducted as an output of a broader project being conducted by Leprosy Mission Nigeria titled 'Strengthening Integrated NTD Control in Zamfara State'. The project is supported with funding from the Australian government Department of Foreign Affairs and Trade (DFAT) and Leprosy Mission Australia.

The study has three main outcomes: prevalence of anxiety and depression among people affected by NTDs, evidence on barriers to the uptake of mental health services among people affected by NTDs and evidence on effective integration strategies for mental health services for people affected by NTDs.

Methods

Study site

The study was conducted in 24 communities in eight local government areas (LGAs) of Zamfara State, North-west Nigeria. The LGAs were Gusau, Bundugu, Maru, Maradun, Talata Mafara, Anka, Kaura Namoda and Tsafe. Three communities from each of the eight LGAs were selected for the study. The study location is indicated in the map in Figure 1.

Study design

This was a cross-sectional study with qualitative and quantitative methods of data collection. We reviewed the records of people who were diagnosed with skin NTDs (leprosy and LF) in primary health centres located in eight LGAs of Zamfara State. Through a purposive sampling technique, we invited 48 people affected by skin NTDs (leprosy, 32; LF, 16) to take part in the study. Also, 48 people who were not affected by NTDs were selected as controls in the study. Each of the controls corresponds to a participant by gender and age range of ± 5 and resides in the same community. The sample size was determined using Fishers' formula:

$$\frac{\frac{Z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{Z^2 \times p(1-p)}{e^2 N} \right)},$$

where Z is the Z -score at a 95% confidence level, N is the population size, e is the margin of error and p is the sample proportion. The above formula gave a sample size of 45 participants.

Screening for anxiety and depression

The 7-item Generalized Anxiety Disorder assessment tool (GAD-7)¹³ was used to assess the participants for anxiety. The GAD-7 is a questionnaire with responses to each question scored between 0 and 3, for a total score of 21. Scores of 5, 10 and 15 are taken as the thresholds for mild, moderate and severe anxiety, respectively.

Screening for depression was conducted using the 9-item Patient Health Questionnaire (PHQ-9) assessment tool.¹⁴ The PHQ-9 responses are scored between 0 and 3. A total score of 5–9 is taken as mild depression, while 10–14, 15–19 and 20–27 are considered moderate, moderately severe and severe depression, respectively.

Barriers to mental health services for people affected by skin NTDs

Semi-structured qualitative interviews were conducted with the people affected by skin NTDs to elicit their barriers to mental health services. The interviews with each participant lasted for about 20–40 min. All the interviews were conducted in the Hausa language and were recorded with a digital audio recording device (ICD PX-470, Sony, Tokyo, Japan). The recorded interviews were then transcribed and translated into English and then analysed using the NVivo qualitative analysis software (Lumivero, Denver, CO, USA).

Synthesizing the evidence to integration of mental health services

In order to examine the effective integration of NTDs and mental health for people affected by skin NTDs, we interviewed 48 health workers of different cadres from three health centres in each of the eight LGAs of our study in Zamfara State. Two health workers were selected from each health centre using the snowballing technique. Most of the interviews were conducted in the

Hausa language and each interview took 20–45 min. The interview questions were centred on the mental health services available to people affected by NTDs and the capacity of the health worker to offer mental health services.

Inclusion/exclusion criteria

In addition to the previously mentioned criteria for involvement in the study, only people who were ≥ 18 y of age participated in the study.

Data analysis

Descriptive statistics including means, percentages and frequencies were used to describe the demographics and perspectives of the respondents. Chi-squared analysis was also performed using Stata (version 18.0; StataCorp, College Station, TX, USA) to determine the statistical significance of the mental status of the study group and the control group. The qualitative data generated were analysed using semantical content analysis, which enables the analysis of content based on the meaning of what is being said. Interview transcripts were analysed using NVivo 12 qualitative software (Lumivero).

Results

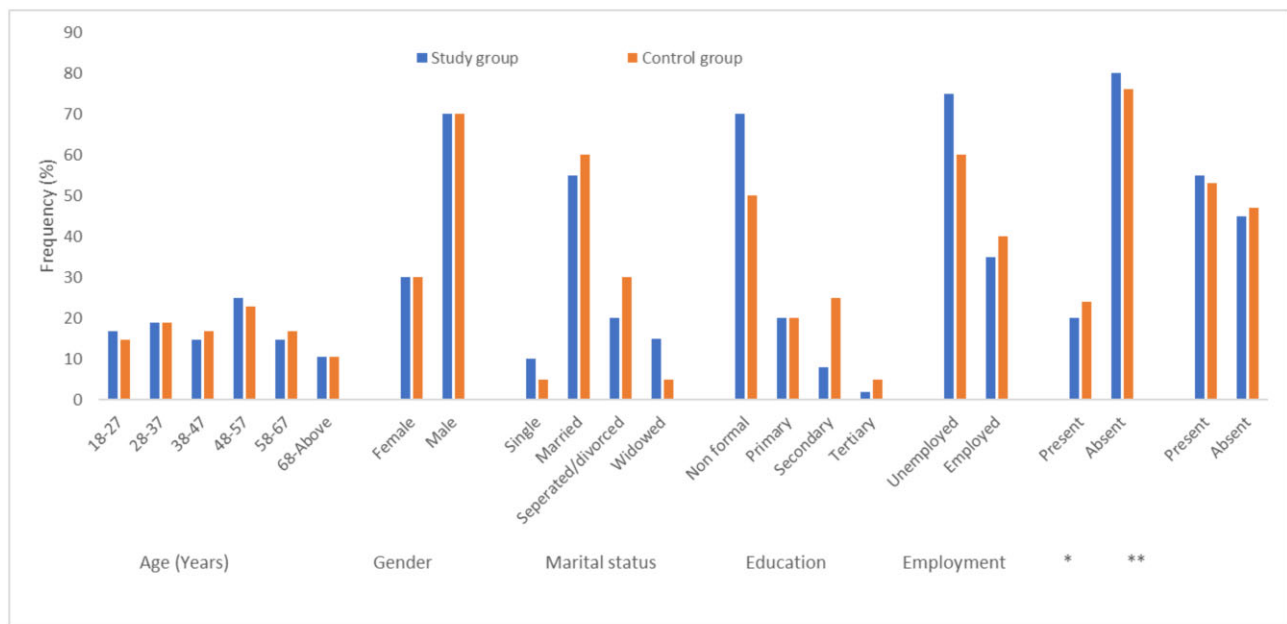
Prevalence of anxiety and depression among people affected by NTDs

In this study we examined a total of 48 people affected by skin NTDs along with 48 corresponding controls for anxiety and depression. The age of participants ranged from 18 to 73 y, with 70% males and 30% females. The demographic characteristics of the respondents are shown in Figure 2.

Of the 48 people affected by skin NTDs who participated in the study, 32 (66.67%) were affected by leprosy and 16 (33.33%) were affected by LF. Details of the NTD status of the study participants are shown in Table 1.

Anxiety disorder was found in 100% of people affected by LF and 62% of people affected by leprosy. The prevalence of depression was 56% and 75% among people affected by leprosy and LF, respectively. Statistically, we found a significant difference in the prevalence of anxiety disorder between persons affected by leprosy and persons affected by LF ($p < 0.05$). However, there was no statistically significant difference in the prevalence of depression and the severity of depression among persons affected by leprosy and persons affected by LF, as shown in Table 2.

The prevalence of anxiety and depression among people affected by skin NTDs compared with the control group is presented in Table 3. Anxiety disorder was present in 75% of the study group and 68.75% of the control group, whereas depression rates were 62.5% and 50% in the study group and control group, respectively. Statistically, we found no significant difference in the prevalence of anxiety and depression and the severity of depression between participants in the study group and those in the control group ($p > 0.05$).



* Family history of mental illness
Diabetes mellitus, Tuberculosis

** Family history of other medical conditions such as HIV,

Figure 2. Demographic characteristics of participants screened for the prevalence of anxiety and depression. *Family history of mental illness. **Family history of other medical conditions such as human immunodeficiency virus, diabetes mellitus and tuberculosis.

Table 1. The NTD status of study participants

Characteristics	n (%)
Disease conditions	
Leprosy	32 (66.67)
LF	16 (33.33)
Total	48 (100.00)
Severity of leprosy ^a	
Grade 0	4 (8.33)
Grade 1	9 (18.75)
Grade 2	19 (39.58)
Total	32 (66.67)
Severity of LF ^b	
Grade 1	3 (6.25)
Grade 2	7 (14.58)
Grade 3	6 (12.50)
Total	16 (33.33)

^aSeverity of leprosy disability: based on the WHO disability grading system¹⁹ for impairment of the eyes, hands and feet (grade 0: no disability, 1: slight disability, 2: severe disability).

^bSeverity of LF disability: based on the WHO LF grading system²⁰ (grade 1: mild, 2: moderate, 3: severe).

Table 2. Prevalence of anxiety and depression among the study cohorts

Parameters	Leprosy (n=32), n (%)	LF (n=16), n (%)	χ^2	p-Value
Anxiety disorder				
Absent	12 (37.50)	0 (0.00)	8.00	0.0047
Present	20 (62.50)	16 (100.00)		
Depression				
Absent	14 (43.75)	4 (25.00)	1.60	0.6059
Present	18 (56.25)	12 (75.00)		
Depression severity				
Absent	14 (43.75)	4 (25.00)	3.87	0.2839
Mild	8 (25.00)	4 (25.00)		
Moderate	6 (18.75)	7 (43.75)		
Severe	4 (12.50)	1 (6.25)		

My major problem is that I do not have money to go to the hospital. I can barely feed. the hospital is also very far. I need money to transport myself to the hospital. (Male, 53)

Another respondent also lamented that:

The only money I have is for food. Anything other than that, I cannot afford. I cannot buy drugs when they are prescribed. Also, the hospital is far from here. (Female, 48)

Evidence of barriers to the uptake of mental health services among people with NTDs in Zamfara State

The interviews with the 48 people with NTDs in Zamfara State indicate that their main barrier to accessing mental health services is a lack of money. One of the participants stated thus:

Table 3. Prevalence of anxiety and depression among the study and control participants

Parameters	Study group (n=48), n (%)	Control group (n=48), n (%)	χ^2	p-Value
Anxiety disorder				
Absent	12 (25.00)	15 (31.25)	0.48	0.5271
Present	36 (75.00)	33 (68.75)		
Depression				
Absent	18 (37.50)	24 (50.00)	1.52	0.2207
Present	30 (62.5)	24 (50.00)		
Depression severity				
Absent	18 (37.50)	24 (50.00)	3.32	0.3476
Mild	12 (25.00)	14 (29.17)		
Moderate	13 (27.08)	7 (14.58)		
Severe	5 (10.42)	3 (6.25)		

Table 4. Professional qualifications of healthcare providers in Zamfara State

Professional qualification	Participants, n (%)
SCHEW	1 (2.08)
CHEW	8 (16.67)
JCHEW	21 (43.75)
CHO	1 (2.08)
HIM	2 (4.17)
PT	1 (2.08)
MLT	1 (2.08)
Nurse	3 (6.25)
CM	1 (2.08)
DHT	2 (4.17)
MCB	2 (4.17)
EHT	1 (2.08)
Other	4 (8.33)

SCHEW: senior community health extension worker; CHEW: community health extension worker; JCHEW: junior community health extension worker; CHO: community health officer; HIM: health information management; PT: pharmacy technician; MLT: medical laboratory technician; CM: community midwife; DHT: dental health technician; MCB: microbiologist; EHT: environmental health technician; other: unspecified professions.

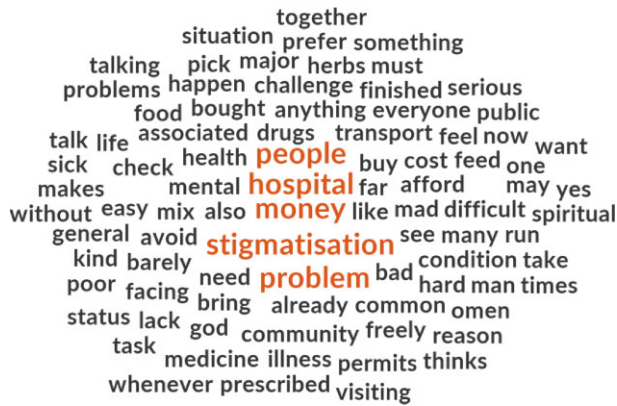


Figure 3. Word cloud analysis of the barriers to accessing mental health services by people with NTDs.

People with NTDs also fear that they will be stigmatized if they go to the public hospitals because of their skin conditions. According to one of the respondents:

We are facing stigmatization. We cannot freely mix with other people because of our health condition. This is a problem that God permits us to have but some people think that we bought it with money. (Male, 50)

A word cloud analysis of the barriers to accessing mental health services based on the respondents perspectives is shown in Figure 3.

Other people with NTDs also expressed their worries that the hospitals are located at a very far distance from their locations, thereby hindering easy access to healthcare.

Evidence of effective integration strategies for mental health services for people with NTDs in Zamfara State

Efforts towards the integration of mental health services for people with NTDs in Zamfara State have not yet yielded the expected

results. This is indicated by the assessment of 24 health facilities in eight LGAs of the state, as well as the interviews conducted with the healthcare personnel in the different health centres. The assessment showed that there is no psychiatry section or trained mental health staff in any of the health facilities studied. Mental health knowledge among the health personnel interviewed is minimal. Patients in the various health facilities are predominantly being managed by personnel whose highest qualification is Junior Community Health Extension Worker (JCHEW), with no further training on mental health (Table 4).

Although there is generally a low degree of knowledge of mental health and minimal capacity to diagnose mental illness among the health personnel, they have all expressed their willingness to embrace any mental health training that is provided.

When asked whether they would like to be trained on how to diagnose and manage mental illness, one of the health personnel responded thus:

Why not? I am willing to embrace any training opportunity that can increase my knowledge to understand, diagnose, and treat mental illness. (Male, 43)

We need training to be able to manage mental illness. We do not have medication and we lack training. I will be happy to be trained on mental health. (Female, 38)

Discussion

In this study, the prevalence of depression and anxiety among people affected by skin NTDs in selected communities of Zamfara State, Nigeria was examined. The study also investigated the barriers to the uptake of mental health services among people affected by skin NTDs, as well as the evidence of effective integration strategies for mental health in NTD programming in Zamfara State.

The findings revealed that the prevalence of anxiety and depression among people affected by skin NTDs is 75% and 62.5%, respectively, whereas the prevalence among the selected control participants, who were persons not affected by skin NTDs, was found to be 68% and 50%, respectively. Also, 100% of the participants who are affected by LF tested positive for anxiety disorder, while 62.5% of those affected by leprosy also showed signs of anxiety. Similarly, 75% of people affected by LF tested positive for depression, while 56.25% of participants who had leprosy tested positive for depression. On the severity of the depression for all participants with NTDs, 10.42% had severe depression, 27.08% had moderate depression and 25% had mild depression.

These reported prevalences are a cause for alarm, although not surprising when factors such as the living conditions of the affected population are taken into consideration. There is a dearth of reports on the prevalence of anxiety and depression among persons from Nigeria affected by skin NTDs. Some of the studies we reviewed include Obindo et al.,¹⁵ who reported a 44.5% prevalence of post-partum depression in north-central Nigeria; Govindasami et al.,¹⁶ who reported a 19% prevalence of anxiety and 33% prevalence of depression among people with leprosy in India; and Clarito et al.,¹⁷ who reported a 57.35% prevalence of anxiety and 24.67% prevalence of depression among leprosy patients in The Philippines.

We used statistical tools to compare the prevalence of anxiety and depression between the study participants affected by leprosy and those affected by LF, which showed that there was a significant difference in prevalence between the two groups. However, we found no statistically significant difference in the prevalence of anxiety and depression between persons affected by skin NTDs and the control participants in the study. This study recorded a remarkably high prevalence of mental health disorders both among people affected by skin NTDs and in the control group. We admit that this high prevalence recorded in both the study and control groups could be a result of our sample size lacking the statistical power to provide an accurate estimate. Also, the screening tools for mental health assessment used in this study were developed for global use and therefore may require further validation in the local context to be able to yield a more precise assessment.

One barrier to accessing mental health services by people with NTDs is a lack of money to transport themselves to the hospital. Also, people with NTDs fear that they will be stigmatized when they visit hospitals to seek mental health support. Other barriers include the distance from an individual's place of residence to the hospital and the lack of trained healthcare personnel for mental health services. These barriers are corroborated by a 2020 global citizens report¹⁸ that listed four barriers to accessing mental health services: lack of access to mental health services,

stigma and misinformation, lack of policy and the cost of mental health care.

Regarding the evidence of integration strategies for mental health services for people with NTDs, this study revealed that although there may be policy in place, it is very far from being implemented. Healthcare workers are lacking in the skills and capacity to provide mental health services and community health centres need to be strengthened to be able to provide mental health services for people with NTDs.

Conclusions

There is no doubt about the critical need for mental health integration into primary healthcare, especially in communities of people with NTDs. The findings from this study and similar studies provide useful information that should be considered by all partners and stakeholders in the drive towards the integration of mental health services at the community level. The high prevalence of anxiety and depression among people with NTDs and the apparent deficiency of mental health knowledge and capacity among healthcare workers as revealed in this study point to this obvious need.

The findings indicate that the level of implementation of the integration of mental health services for people with NTDs is far below desirable thresholds. The massive gap in the knowledge of mental health among healthcare workers in NTD-endemic communities in Zamfara State, Nigeria calls for concerted efforts to address the mental health needs of the affected communities.

The findings of this study point to the fact that there is a need to design and implement policies that consider the local context rather than relying on a generalized perspective.

Authors' contributions: SU and PSO conceived the study. PAT and PSO designed the study protocol. PAT and AT carried out the field assessment and analysis and interpretation of the data. PAT and PSO drafted the manuscript. SU, AT and AN critically revised the manuscript for intellectual content. All authors read and approved the final manuscript. SU and PSO are guarantors of the paper.

Acknowledgements: The authors wish to acknowledge the contributions of the persons affected by NTDs in Zamfara State, Nigeria, without whom this study would not be possible. We also acknowledge the Zamfara State Ministry of Health for cooperating with us to successfully conduct this study.

Funding: This study was funded by the Department of Foreign Affairs and Trade (DFAT) through Leprosy Mission Australia. The views expressed in this publication are those of the authors and not necessarily those of the Australian government or the Australian DFAT.

Competing interests: PAT is a Guest Editor of this journal supplement but had no role in the review of this manuscript. All other authors declare no competing interests.

Ethical approval: Ethics clearance for the study (reg. no. NHREC/10/11/2011b) was obtained from the Zamfara State Ministry of Health Research Ethics Committee, Gusau prior to the commencement of data

collection. Before recruitment into the study, details about the study were read to each participant, who were given up to 24 h to decide to participate in the study. A written informed consent was signed by each participant before recruitment. Confidentiality was maintained to ensure that no personal details were linked to the output of the study.

Data availability: The authors confirm that the data supporting the findings of this study are available within the article [and/or] its supplementary materials.

References

- 1 World Health Organization. Neglected tropical diseases. 2020. Available from: https://www.who.int/neglected_diseases/diseases/en/
- 2 Henshaw E, Otike-Odibi B, Okpa H, et al. Neglected tropical skin diseases in a Nigerian tertiary hospital. *Niger J Med.* 2018;27(2):114.
- 3 World Health Organization. Leprosy. Available from: <https://www.who.int/westernpacific/health-topics/leprosy>
- 4 World Health Organization. Global leprosy update, 2018: moving towards a leprosy-free world. 2019. Available from: <https://apps.who.int/iris/bitstream/handle/10665/326775/WER9435-36-en-fr.pdf?ua=1>
- 5 Lymphatic filariasis. Available from: <https://www.who.int/westernpacific/health-topics/lymphatic-filariasis>
- 6 Obindo J, Abdulmalik J, Nwefoh E, et al. Prevalence of depression and associated clinical and socio-demographic factors in people living with lymphatic filariasis in Plateau State, Nigeria. *PLoS Negl Trop Dis.* 2017;11(6):e0005567.
- 7 World Health Organization. Mental health of people with neglected tropical diseases: towards a person-centred approach. Geneva: World Health Organization; 2020.
- 8 Wakida EK, Talib ZM, Akena D, et al. Barriers and facilitators to the integration of mental health services into primary health care: a systematic review. *Syst Rev.* 2018;7(1):211.
- 9 Federal Ministry of Health. The national mental health policy for Nigeria. Lagos: Federal Ministry of Health; 1991.
- 10 Federal Ministry of Health. National policy for mental health services delivery. Abuja: Federal Ministry of Health; 2013.
- 11 Ryan GK, Nwefoh E, Aguocha C, et al. Partnership for the implementation of mental health policy in Nigeria: a case study of the Comprehensive Community Mental Health Programme in Benue State. *Int J Ment Health Syst.* 2020;14(1):10.
- 12 Maternal, Newborn & Child Health Programme. Zamfara State. Available from: <https://www.mnch2.com/zamfara-state/>
- 13 Johnson SU, Ulvenes PG, Øktedalen T, et al. Psychometric properties of the general anxiety disorder 7-item (GAD-7) scale in a heterogeneous psychiatric sample. *Front Psychol.* 2019;10:1713.
- 14 Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med.* 2001;16(9):606–13.
- 15 Obindo TJ, Ekwempu CC, Ocheke AN, et al. Prevalence and correlates of postpartum depression in a teaching hospital in Nigeria. *Highland Med Res J.* 2013;13(2):71–5.
- 16 Govindasamy K, Jacob I, Solomon RM, et al. Burden of depression and anxiety among leprosy affected and associated factors—a cross sectional study from India. *PLoS Negl Trop Dis.* 2021;15(1):e0009030.
- 17 Clarito ELR, Valiente MV, Zabat GMA. 1660. Prevalence and predictors of anxiety and depression among leprosy patients using the Hospital Anxiety and Depression Scale–Pilipino Score in a tertiary hospital. *Open Forum Infect Dis.* 2020;7(Suppl 1):S817–8.
- 18 Global Citizen. 4 barriers to accessing mental health services around the world. Available from: <https://www.globalcitizen.org/en/content/barriers-to-mental-health-around-the-world/>
- 19 Nienhuis WA, van Brakel WH, Butlin CR, et al. Measuring impairment caused by leprosy: Inter-tester reliability of the WHO disability grading system. *Lepr Rev.* 2004;75(3):221–32.
- 20 Bing. Grading of lymphatic filariasis impairment. Available from: <https://www.bing.com/search?q=grading+of+lymphatic+filariasis+impairment&qs=n&form=QBRE&sp=-1&ghc=1&lq=0&pq=grading+of+lymphatic+filariasis+impairment&sc=4-42&sk=&cvid=06DE2A7791B0474B94713F33C9E13641&ghsh=0&ghacc=0&ghpl=>