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Leprosy in Sudan: What is the current situation?

Authors

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Abstract

Background: Leprosy is a communicable disease that remains a neglected global health concern. Leprosy is a contagious skin disease that continues to pose a chronic public health issue in Sudan. This research aimed to analyze the household connections of leprosy patients in North Kordofan state during the period from 2020 to 2021. **Methodology:** This prospective, descriptive, community-based study was conducted in El-Obeid city, focusing on all households that interacted with leprotic patients between November 2020 and July 2021. The study has 116 cases (total coverage). Aside from the questionnaire, clinical examinations and skin smears for microscopic investigation were conducted. **Results:** One hundred sixteen household contacts of forty leprotic patients were investigated. Most of the participants, comprising 57% females and 60% of the studied individuals, were uneducated. Additionally, most resided in rural areas and had not engaged in any form of employment. The prevalence of leprosy among contacted households was 16.4% for multibacillary cases. 89.5% of newly diagnosed patients had multibacillary leprosy, with a male predominance of 63% over females. Most were residents in rural areas, accounting for 68.4%. **Conclusion:** The present study concluded that household contacts with leprotic patients require close attention for early diagnosis to prevent the transmission of the disease and to implement control measures effectively. Raising awareness of at-risk communities is essential for effective infection control.

Keywords: Leprosy, Household, Sudan, Multibacillary, Pucobacillary

INTRODUCTION

Leprosy, known as Hansen's disease, is caused by Mycobacterium leprae and Mycobacterium lepromatosis, which are classified as the M. leprae complex. This condition remains a significant concern in the medical community [1]. The condition initially impacts the skin, advancing to a secondary stage marked by peripheral neuropathy, potentially leading to long-term disability and social stigma [2]. Leprosy is a notable global health issue, an ancient disease that continues to pose public health challenges and remains

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endemic in numerous countries [3, 4]. In 2022, there were 174,087 new cases reported globally, with 22,022 (12.6%) of these arising from 42 of the 47 countries in the African Region, leading to a detection rate of 18.5 per million population. In 2022, the African Region reported 1,812 new child cases, representing 8.2% of the total new cases. This percentage equates to a rate of 3.7 per million within the child population [5].

Even though the World Health Organization (WHO) declared "eradication" in 2000, the global reporting of new cases in 2017 was approximately 0.2 million. The World Health Organization has recently launched the Global Leprosy Strategy 2021-2030, known as "Towards Zero Leprosy" [6]. Individuals engaging with leprosy patients within their surroundings, community, familial, or social networks are at risk of acquiring the disease [7]. Diagnosing leprosy is a complex task, particularly when the infection presents atypical symptoms or affects regions beyond the skin. Delayed diagnosis and treatment can result in irreversible damage and potentially death [8]. Slit skin smears and skin or nerve biopsies are conducted mainly to rule out other conditions, confirm a diagnosis, and determine the immunological subtype of the case [9]. Treatment for leprosy consists of a combination of medications, including dapsone, rifampin, and clofazimine. Leprosy is curable; however, early identification and treatment are essential to prevent permanent damage and disabilities [10]. This research analyzed the household connections of leprosy patients in North Kordofan State from 2020 to 2021.

MATERIALS AND METHODS

This research is a prospective, descriptive, community-based study carried out in El-Obeid city, focusing on all households that interacted with leprosy patients from November 2020 to July 2021. The study included 116 individuals who were household contacts of 40 leprosy patients. From 2014 to 2019, patients at El-Obeid Teaching Hospital were clinically diagnosed and evaluated for acid-fast bacilli to confirm leprosy cases. Data were obtained via a questionnaire and supplemented with information from the patient's hospital records.

Data Analysis

The data was first organized in a data sheet and then input into the Statistical Package for the Social Sciences (SPSS) (Version 24, Chicago, USA). Frequencies, percentages, cross-tabulation, and chi-square tests were calculated. The p-value was determined based on a 95% confidence interval (95% CI). A p-value below 0.05 is considered statistically significant.

RESULTS

This study examined 116 households in relation to the clinical diagnosis of 40 patients, utilizing slit smear analysis. Of the 116 participants, 50 (43%) were males and 66 (57%) were females, with ages ranging from 2 to 61 years and a mean age of 25 years. Most participants were aged 10-20 years, followed by ≤10 years and ≥41 years, representing 28/116 (24.1%), 24 (20.7%), and 23 (19.8%), respectively. About 66/116 (57%) were married, and the remaining 50 (43%) were single. Most patients were rural residents, 90 (77.6%), compared to 26 (23.4%) urban inhabitants, as indicated in Table 1, Fig. 1.

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Table 1. Distribution of the study subjects by sex, age, marital status, and residence

Variable	Males	Females	Total
≤10 years	10	14	24
10-20	13	15	28
21-30	8	11	19
31-40	8	14	22
≥41	11	12	23
Total	50	66	116
Marital status			
Single	25	25	50
Married	25	41	66
Total	50	66	116
Residence			
Rural	36	54	90
Urban	14	12	26
Total	50	66	116

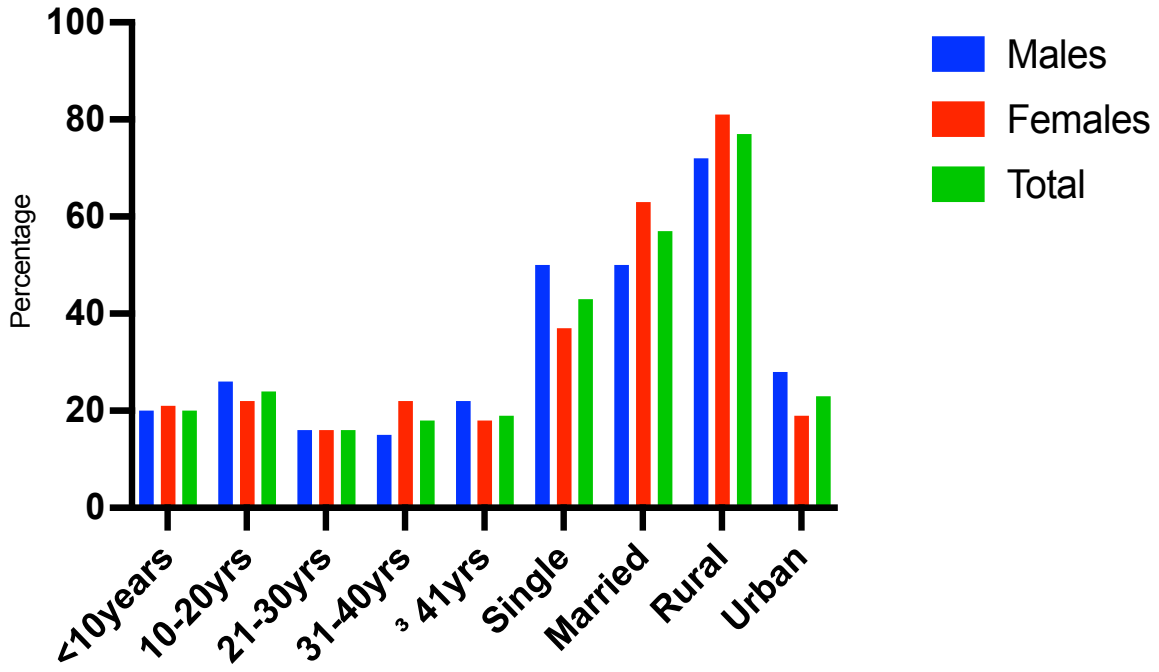

Figure 1 provides a description of the study subjects based on their demographic characteristics.

Education data indicated that 70 individuals (60%) of the studied population were not educated, 26 individuals (57%) had attained primary school education, 14 individuals (30%) had completed secondary school, and 4 individuals (9%) had reached university-level education, as illustrated in Table 2.

In relation to occupation, 34 individuals (29%) are unemployed, 33 (28%) are

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children, 15 (13%) are engaged in lower-paying jobs, 15 (13%) are housewives, 8 (7%) are involved in freelance business, 6 (5%) are farmers, and 1 (0.9%) is categorized as a soldier, teacher, employee, trade dealer, or retired, as illustrated in Table 2.

Table 2. Distribution of the study subjects by education and occupation

Variable	Males	Females	Total
Education			
not educated	27	43	70
Primary	15	13	28
Secondary	5	9	14
University	3	1	4
Total	50	66	116
Occupation			
Housewife	0	15	15
Jobless	17	17	34
Livestock holds	9	6	15
Farmer	3	3	6
Child	15	18	33
Free Business	4	4	8
Trade dealer	1	0	1
Teacher	0	1	1
Solder	1	0	1
Employee	0	1	1
Retired	0	1	1
Total	50	66	116

The total occurrence of leprosy observed in this study was 19 out of 116, which equates to 16.4%. All 19 positive cases were identified through slit skin smear analysis. The diagnosed cases were categorized into 17 multibacillary (89.5%) and 2 paucibacillary (10.5%).
The study examined the sociodemographic characteristics of households in contact with individuals who had leprosy, revealing that the age group of 31-40 constituted 31.5%, while those over 41 accounted for 31%. Additionally, the findings indicated that males were more prevalent than females, with 12 (63%) males compared to 7 (37%) females. The findings indicated that 13 individuals, representing 68.4%, were in a rural environment.
Data on education indicates that 5 individuals (26%) are not educated, 1 individual (5%) has a khalwa type of education, and 7 individuals (36%) have attained a primary school level of education. Three individuals, representing 15.7%, possessed a secondary school level of education, while an equal number held a university degree.
Regarding employment status, 7 individuals (36.8%) are unemployed, 6 (31.5%) are housewives, 4 (21%) are engaged in free business, and 1 (5.2%) is involved in livestock holding.

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Table 3. Distribution of the study subjects by infection status, and demographic features

Variable	Multibacillary	Pucobacillary	Total
Sex			
Males	10	2	12
Females	7	0	7
Total	17	2	19
Martials Status			
Single	5	1	6
Married	12	1	13
Total	17	2	19
Age			
≤10 years	0	1	1
10-20	1	1	2
21-30	4	0	4
31-40	6	0	6
≥41	6	0	6
Total	17	2	19

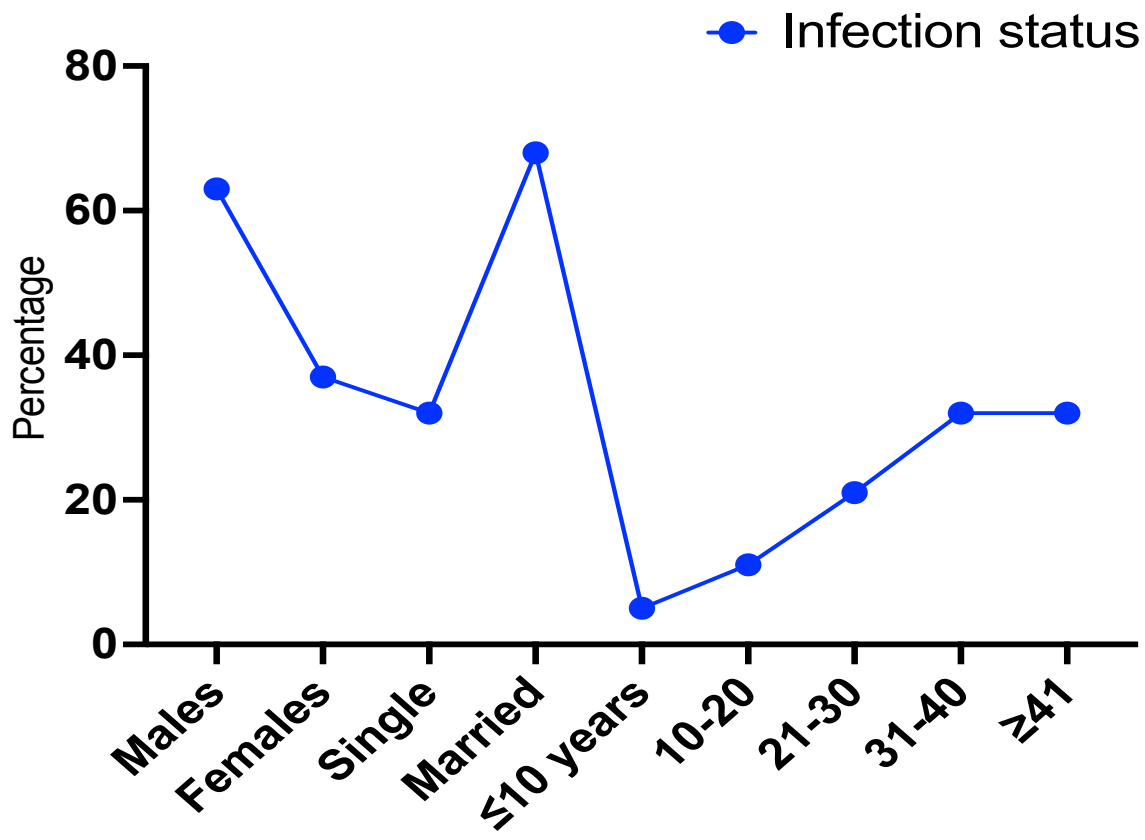

Figure 2: Describe the study subjects by infection status, sex, marital status, and age.

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Table 4. Distribution of the study subjects by infection status, residence, education, and occupation

Variable	Multibacillary	Pucobacillary	
Residence			
Rural	11	2	13
Urban	6	0	6
Total	17	2	19
Education			
not educated	4	1	5
Khalwa	1	0	1
Primary	6	1	7
Secondary	3	0	3
University	3	0	3
Total	17	2	19
Occupation			
Housewife	6	0	6
Without Job	5	2	7
Cheaper	1	0	1
Farmer	0	0	0
Child	0	0	0
Free Business	4	0	4
Trade dealer	0	0	0
Teacher	0	0	0
Solder	0	0	0
Employee	1	0	1
Retired	0	0	0
Total	17	2	19

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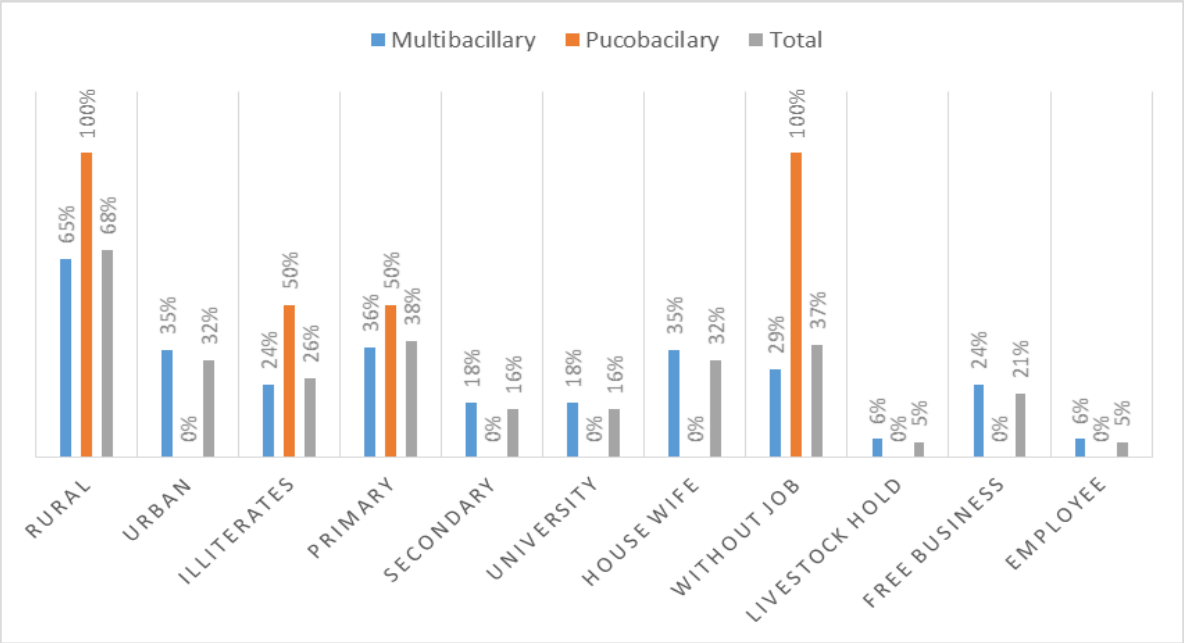

Figure 3: Describe the study subjects by infection status, residence, education, and occupation.

DISCUSSION

Leprosy is one of the ancient health problems that afflicted many societies, particularly in low-resource countries. Despite the disease's eradication in many parts of the world, it continues to pose a challenge in several areas of poor countries, including Sudan.

The prevalence of leprosy in this study was found to be 16.4%. Leprosy is one of the ancient health problems that afflicted many societies, particularly in low-resource countries. Although the disease is eradicated in many parts of the world, it is still challenging several areas in poor countries, including Sudan. Because it is still highly stigmatized and there is little information about the disease, other studies on stigma will be done.

During 2023, there were 182,815 new cases reported globally, with 21,043 (11.5%) new cases from 45 out of 47 countries in the African Region, corresponding to a rate of detection of 17.2 per million population [11].

Although new cases of leprosy in nine states of the Republic of the Sudan have been reported to be declining [12], our data may be suggestive of a significant impact of household contacts during the Sudan war due to limited health services in the country. Overall, household contact screening proved to be efficient in the detection of the new cases.

The current study revealed that disease was slightly predominant in females, who were 66 (57%), and males, who were 50 (43%). Similar findings were found in the study by L, in which females accounted for 53% [13]. Another study found that the male is more than the female. Of the notified cases, 96/164 (58.5%) were males and 68/164 (41.5%) were females.

Regarding age, our participants ranged from 2 to 61 years, with a mean age of 25 years old. These findings are most similar to findings reported in another country, where the median age of patients was 35 years, with a range of 7 to 72 years [14].

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Leprosy is a disease of poverty, like in our country, and is associated with uneducated, low socioeconomic individuals, as shown in this study and others, and is also considered a disease of rural areas [15-17].

Our study revealed that there was asymptomatic positivity with leprosy among households, and most types were multibacillary. 17 (89.5%) Similar results were previously reported: multibacillary leprosy was the most common type seen in 80.8% of patients [18], and just 2 (10.5%) of them were paucibacillary. Another study found the most cases beyond the age group of 40-59 years (87, or 37.66%). Another study found that the majority of the cases were uneducated [19].

Conclusion, Leprosy is a common neglected disease in Sudan, and it's considered a disease of any age. Poverty and being uneducated are risks of less awareness. Commonly in rural areas, so education is recommended in Sudan to help in the complete eradication of a disease. So, the state ministry of health and national program should conduct basic training with regular supervision visits. Regular household contacts should be examined for 5 years, especially in multibacillary. National programs should continue to supply treatment, which is not always continuous.

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Conflict of interest

The authors declare no conflict of interest.

Ethical considerations

Authorities at El-Obeid International Hospital granted permission to access the notified information.

Ethical approval

The Human Research Ethics Committee at MRCC has approved the study's proposal. Approval Number: HREC0007/PMRCC.3/24.

Data availability

Data regarding this study is available from the corresponding author.

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