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Prevalence of Self Reported Sleep Problems among Patients with HIV Infection in Sokoto, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Authors MAY and AO designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors AO and MAY managed the literature searches, analyses of the study and final write up. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Sleep disturbance results in physical, mental and emotional disturbances among patients with HIV infection. In spite of these observations, studies of sleep problems among HIV patients from Sub-Saharan Africa are limited.
Aim: To determine prevalence of sleep problems among patients with HIV infection in a north western Nigeria.
Methodology: This is a cross sectional study among patients with HIV infection (n = 159) conducted in VCT (Voluntary Counselling and Testing) center of a teaching hospital in Sokoto, Nigeria. Questionnaire comprising of three sections including sociodemographic, sleep pattern, and psychiatric morbidity were administered to the subjects. Sleep pattern was assessed using clinical assessment variables such as early, middle, and late insomnia, presence of nightmare and non-restorative sleep. Psychiatric morbidity was assessed through the use of Hospital Anxiety and Depression Scale. Statistical analysis was performed with frequency distribution and Pearson's chi square test to test for associations. A significance level of 5% was established.
Results: The prevalence of sleeping problems among the subjects was 20%. Non-restorative sleep

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is the most prevalent sleep problem among the patients. Factors associated with sleep problems included being employed and presence of psychiatric morbidity.
Conclusion: This study suggested that the prevalence of sleep problems among the patients with HIV infection is high. Routine screening for sleep problems is suggested.

Keywords: Sleep problems; HIV infection; patients; Sokoto; Nigeria.

1. INTRODUCTION

Sleep problems (or disturbances) influence physical and mental well-being as well as quality of life [1,2]. Among patients with HIV (Human Immunodeficiency Virus) infection, sleep disturbance has been associated with daytime sleepiness, neurobehavioral disturbance, cognitive disturbance, depression and reduced quality of life [3–5]. These findings have therefore resulted in interest in the study of sleep among patients with HIV infection.

Available evidence suggested that the prevalence of sleep disturbance among patients with HIV infection was high with or without antiretroviral treatments [6–10]. In a recent study among military personnel with HIV infection, prevalence of sleep disturbance was 46% [11]. This high prevalence remained the same among HIV infected patients in the general population [10]. In a meta-analysis of 27 articles comprising 9246 HIV patients, the prevalence of sleep disorder was 58.0% [12]. Also, a review 10 years ago, suggested that most studies on sleep disorders among patients with HIV infection were from USA, Europe and rarely from Africa [10]. The paucity of studies of sleep disturbance among HIV patients in Africa has not changed significantly. A more recent meta-analysis which included 27 papers [12] observed that only 3 papers could be attributable to Africa, of which 1 was from Nigeria [13] while the other 2 were from Uganda [14] and South Africa [15]. The report from Nigeria was from Lagos, an urban area. Previous study has suggested that people living in urbanized area frequently suffer from sleep disorder [16]. Hence the report from Lagos, Nigeria cannot be representative of other parts of the country particularly, the hinterland. The aim of the present study was therefore to determine the prevalence and associated factors of sleep disturbance among patients with HIV infection in Sokoto.

2. METHODS

2.1 Study Design and Location

This report is part of a hospital based study which was conducted in Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria. A more detailed report on methodology has been described elsewhere [17]. In summary, this descriptive cross sectional study was carried out in July 2010 among HIV patients who were diagnosed and commenced HAART (Highly active antiretroviral therapy) treatment at the VCT (Voluntary Counseling and Testing) center of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto. The HAART combination in this center comprised of Efavirenz, Tenofovir, and Lamivudine.

Two hundred asymptomatic subjects were recruited through convenience sampling for this study out of which 167 were returned. However, only 159 questionnaires were valid enough for further analysis for this report on sleep problems.

The subjects were apparently healthy individuals and had only come for their routine medical checkup or with minor ailments. Ethical clearance was obtained from the hospital where the study was conducted. In addition, the consent of individual patient was obtained orally and from the questionnaire “are you willing to participate in this study?” Exclusion criteria included desire not to participate in the study, patients who were sick and could not cooperate or debilitated subjects. Other exclusion criteria included previous history of psychiatric problem other than anxiety and depression, current major psychiatric problems such as schizophrenia, major depressive disorder, or bipolar affective disorders, inability to understand English or Hausa and subjects below the age of 18 years.

Variables relating to sociodemographic profile and sleep disturbance were obtained through the use of self-administered questionnaire although some required assistance. Sleep was assessed by asking the subjects to subjectively rate their sleep into good, fair and poor. In addition, the sleep problem was further assessed through the following clinical variables which included difficulty falling asleep (early insomnia), waking up frequently (waking up more than 2 times per night without obvious reason such as voiding) (middle insomnia), waking up earlier than usual (late insomnia), experiencing nightmare or not

feeling refreshed on waking up (non-restorative sleep).

Psychiatric morbidity was assessed through the use of Hospital Anxiety and Depression Scale [18]. This instrument measured 2 psychiatric morbidity including anxiety and depression. Each psychiatric morbidity used Likert scoring scale which is in the range of 0 – 21. The score of 0 – 7 was considered as no case, 8 – 10 considered borderline and 11 and above considered definite cases for depression or anxiety.

In Nigeria, this instrument has been validated and used in previous studies [17,19]. The questionnaire was self-administered. However for subjects with no formal education, the questionnaire was administered to them by an assistant either in English or local Hausa language. The data obtained was analyzed using SPSS for windows version 16.0. Frequency table and percentage were performed. Cross tabulation was done and significant difference was tested using Pearson's chi square test for categorical variables. P – Value was considered significant if less than 0.05.

3. RESULTS

Two hundred questionnaires were distributed out of which 167 (82.5%) were returned and 159 (79.5%) were considered valid for analysis for this report on sleep. They were mainly young people with the mean age 37.21 (±9.38) years and both genders were represented (male 48, 30.2%; female 111, 69.8%). Their marital status showed that 114 (71.7%) were married and 11 (6.9%) were never married. Subjects with no formal education represented about 28% and those who were gainfully employed were 75 (47.2%) although close to half of them lived below poverty line. One hundred and twelve (70.4%) of the subjects reported having good sleep, while 36 (22.6%) described their sleep as poor. Hence, overall 22.6% reported having sleep disturbances. In addition, using the different sleep pattern, 32 (20.1%) had difficulty falling asleep, 23 (14.5%) woke up intermittently during sleep, 35 (22.0%) woke up in the midnight and could not sleep back, 28 (18.8%) had frequent nightmare and 40 (25.2%) reported not feeling refreshed on waking up. See Table 1.

General self-assessment of sleep showed that the male subjects were more likely to have poor sleep, 34.1% when compared to the female 20.0%. Other factors involved in increased poor sleep included being never married 45.5%, older age group 28.6%, tertiary education 38.7%, unemployed 39.1% ($\chi^2 = 17.2$; P = 0.009).

When individual sleep disturbance features including difficulty initiating sleep, difficulty remaining asleep, waking up earlier than usual, presence of nightmare, and waking up feeling unrefreshed were examined, factors that influenced increased prevalence of having difficulty falling asleep (early insomnia) were male gender 30.0%, age group 20 – 29 years 28.3% ($\chi^2 = 28.82$, P = 0.02), divorced 37.5%, having post graduate education 37.5%, employed 25.4%, living above poverty line 30.2%.

Factors associated with difficulty remaining asleep (middle insomnia) included male gender 18.6%, being age group 50 – 59 years 42.9%, being divorced 25%, having post graduate education 30.0% being employed 20.3% and living below poverty line 17.5%.

With regard to having nightmare, factors associated with increased prevalence were male gender 28.6%, 50 – 59years age 42.9%, being widow 20.0%, low education attainment 26.3%, being employed 20.9% and living below poverty line 19.5%.

Feeling not refreshed (non-restorative sleep) was common among male gender 27.9%, 50 – 59 years age group 50.0%, divorced 37.5%, tertiary education attainment 38.7%, being employed and living below poverty line 30.0%.

The present study suggested that age is an important factor to influence sleep disturbance across different sleep features

From Table 2, across most sleep characteristics assessed, anxiety (P – value = 0.005; $\chi^2 = 10.64$) and depressive disorder (P – value = 0.00; $\chi^2 = 15.93$) were significantly associated with insomnia. However, employment status P – value = 0.009; $\chi 2 = 17.21$) was associated with overall subjective poor sleep while age (P – value = 0.02; $\chi 2 = 28.82$) was associated with early and middle insomnia. Although there was no significant difference across both gender, the male patients had slightly higher prevalence of insomnia when compared with female gender.

Table 1[†]. Sleep pattern among patients with HIV infection

Characteristics	Frequency	%
Gender		
Male	48	30.2
Female	111	69.8
Age class		
<20	2	1.2
20 – 29	47	29.9
30 – 39	66	42.0
40 – 49	33	21.0
50 – 59	8	5.0
≥60	1	0.6
Marital status		
never married	11	6.9
Married	114	71.7
Separated	1	0.6
Divorced	8	5.0
Widow	25	15.7
Religion		
Islam	97	61.8
Christianity	60	38.2
Education attainment		
No formal education	44	27.8
Primary	19	12.0
Secondary	47	29.7
Tertiary	36	22.8
Postgraduate	12	7.6
Employment status		
Employed	75	50.7
Unemployed	73	49.3
Living below poverty line		
Yes	42	46.7
No	47	52.8
Attendance at the clinic		
Regular	146	92.4
Occasionally missed appointment	8	5.1
Only come to clinic rarely	4	2.5
Drug compliance		
Take drugs religiously	143	94.1
Occasionally missed drugs	5	3.3
Often missed drugs	2	1.3
Take drugs poorly	2	1.3
Anxiety disorder		
Normal	134	84.8
Borderline	10	6.3
Definite	14	8.9
Depressive disorder		
Normal	130	82.8
Borderline	15	9.6
Definite	12	7.6
Sleep pattern [†]		
Good	112	70.4
Poor	36	22.6
Early insomnia		
Yes	32	20.1
No	112	70.4
Middle insomnia		
Yes	23	14.5
No	125	78.6

Characteristics	Frequency	%
Late insomnia		
Yes	35	22.0
No	112	70.4
Nightmare		
Present	28	19.2
Absent	118	80.8
Restorative sleep	106	
Yes	106	66.7
No	40	25.2

[T]Where subjects were less than 159, assumed random missing data[20] present

4. DISCUSSION

A review of literature on sleep problems among individuals with HIV infection revealed there are limited studies in Africa. In the present study, the prevalence of sleep problems was estimated among patients with HIV infection in a sub-Saharan African country, Nigeria and explored independent associations of sociodemographic characteristics, clinical attendance and medication adherence, and psychiatric morbidity specifically depression and anxiety on sleep problems. Missing data were assumed to be random and were dealt with by analyzing only available data [20]. In the assessment of sleep problems or insomnia, previous studies have used PSQI (Pittsburgh Sleep Quality Inventory). However, this instrument has been criticized as not validated as insomnia diagnostic instrument [6,21]. The present study used features of insomnia such as difficulty initiating or maintaining sleep, or non-restorative sleep which could be found in ICSD-2 (International Classification of Sleep Disorders Second Edition) and DSM IV (Diagnostic Statistical Manual IV) [22–23].

This finding of high prevalence of sleep impairment in the present study has been supported by other studies which found the prevalence of sleep problems as 29 – 97% [24–27]. The variables significantly associated with sleep problems were being young, being employed, poor clinic attendance and treatment adherence, and presence of psychiatric morbidity including anxiety and depression. Marital status, education attainment, and poverty level did not correlate with sleep problems.

4.1 Age

The present study suggested that higher prevalence of sleep problems is seen among older patient compared to younger patients. This result was similar to previous findings [28–31]. This may be related to psychosocial responses to the illness which may be more intense among older age group and therefore may lead insomnia. Older subjects are confronted with coping with job, family issues and domestic requirements including paying bills and taxes.

4.2 Gender

This study revealed that sleep problems were not significantly different across gender although more males reported sleep problems. In determining the role of gender on sleep disturbances, we examined studies that were gender specific. A total of 5 studies were found comprising of 2 studies involving females and 3 studies involving males. The studies suggested that gender does not have significant effects on sleep prevalence [28–32].

4.3 Employment

Being employed is expected to improve sleep as it suggested sustained income and therefore well-being. However, in the present study, subjects who are employed reported more sleep problems than subjects who were not employed. This finding was corroborated by the report of Allavena et al. [27] who found being in active employment was associated with insomnia. This finding has been related to job stress [33].

4.4 Psychiatric Morbidity

From the present study, psychiatric morbidity including anxiety and depression were found to be significantly associated with insomnia. This relationship was present across all the sleep variables assessed. This is in concordance with previous studies which showed that sleep impairment is frequently present in patients with anxiety and depressive disorders [34–35].

Table 2. Patients' demographic characteristics and sleep pattern

Characteristics	Subjective Poor sleep P – value (χ^2)	Early insomnia P – value (χ^2)	Middle insomnia P – value (χ^2)	Presence of Nightmare P – value (χ^2)	Late insomnia P – value (χ2)	Non restorative sleep P – value (χ2)
Gender	0.18 (4.94)	0.44 (2.72)	0.74 (1.25)	0.20 (4.6)	0.53 (0.39)	0.81 (0.42)
Age (years)	0.59 (13.15)	0.02 (28.82)	0.02 (29.1)	0.23 (18.63)	0.43 (4.87)	0.41 (8.24)
Marital status	0.56 (10.63)	0.99 (2.40)	0.99 (2.28)	0.71 (8.94)	0.82 (1.52)	0.83 (4.24)
Education attainment	0.22 (15.51)	0.35 (13.21)	0.70 (9.02)	0.92 (5.85)	0.27 (5.20)	0.60 (6.43)
Employment status	0.009 (17.21)	0.83 (2.82)	0.54 (5.02)	0.76 (3.34)	0.92 (0.10)	0.21 (5.90)
Poverty	0.50 (2.39)	0.18 (3.46)	0.54 (1.22)	0.59 (1.05)	0.58 (0.30)	0.48 (1.46)
Attendance at the clinic	0.53 (3.15)	0.03 (7.18)	0.68 (0.78)	0.53 (1.28)	0.36 (2.06)	0.59 (1.05)
Drug adherence	0.73 (3.60)	0.03 (8.81)	0.70 (1.44)	0.30 (3.67)	0.45 (2.64)	0.11 (6.10)
Anxiety disorder	0.03 (11.09)	0.09 (4.73)	0.004 (11.53)	0.03 (6.84)	0.11 (4.34)	0.005 (10.64)
Depressive disorder	0.16 (6.55)	0.08 (5.07)	0.001 (13.58)	0.26 (2.68)	0.02 (7.84)	0.00 (15.93)

4.5 Nightmare and Non-restorative Sleep

The presence of nightmare and non-restorative sleep were found to be prevalent among the subjects. In spite that ambulatory polysomnographic is diagnostic of insomnia, Paul et al. [36] reported that recordings may be normal even when there is nightmare. Yet previous report has shown that even in the absence of impairment in the other sleep parameter, the presence of nightmare and non-restorative sleep result into poor quality sleep.

4.6 Significance of the Present Study

The present study suggested that variables which may be associated with high prevalence of self-reported sleep problems included being employed, poor clinic attendance, poor medication adherence and having psychiatric morbidity and that these may be pointer to possible presence of sleep problems.

5. LIMITATIONS

The main limitations in the present study were that being self-report and require recollection, the responses may be biased. Also, it is recognized that Efavirenz is associated with sleep disorders including insomnia, we did not examine the role of this drug in the prevalence of sleep problems found in these subjects. In addition, the present report did not assess for shift work among subjects who were employed. Shift work influence sleep pattern and sleep quality and therefore a potential limitation in this study. Other limitation is the fact that while assessing sleep problems, all the variables of ICSD-2 in the diagnosis of sleep disorder were not used.

6. CONCLUSION

In spite of these limitations, the present study supported previous findings of high prevalence of sleep problems among patients with HIV infection. An action plan which includes regular sleep evaluation during follow up is suggested. Intervention such as advice on sleep hygiene and / or medications should be of benefit where sleep problem is identified. Future study should involve larger number of patients using longitudinal controlled study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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