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Prevalence and Pattern of Depression Among Women of Polygamous and Monogamous Family Settings in Rural Areas of Sokoto State, Nigeria

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Abstract: World Health Organization recognizes depression as one of the leading mental illnesses of public health concern, with estimated 300 million people affected. This study assessed the prevalence, pattern and risk factors associated with depression among women in rural areas of Sokoto state. A comparative cross-sectional study was carried out and using a multistage sampling technique, 383 respondents (monogamous 193, polygamous 185) were recruited into the study. A set of structured questionnaire was used to collect data which was analyzed using the Statistical Package for Social sciences (SPSS) version 23. The mean age of the respondents was 33.91±6.8 years in monogamous setting and 35.27±8.3 years in polygamous setting (t=1.189, p=0.235). In both settings, majority of the women were married (monogamous 92.2%, polygamous 89.2%, P>0.05) and all were Muslims. The overall prevalence of depression in both groups was 51.2% (n=197). With respect to family type, prevalence was higher among women in monogamous setting (54.2%) as compared to those from polygamous setting (49.7%) (P=0.578). In both groups, mild depression was the most common type of depression (43.1% among monogamous vs 54.3% among polygamous). Depressive symptoms experienced nearly everyday by respondents in both groups include feeling hopeless and down, having difficulty falling asleep and feeling tired. Significant predictors of depression were marital status and feeling sad for a long time. In conclusion, the overall prevalence of depression was high in this study and the prevalence was slightly higher in monogamous group than polygamous; most respondents in both groups had mild depression. Significant predictors of depression include marital status and being sad for long time. There is need for government health agencies and other partners to strengthen mental health services at community levels to enable early detection and proper management of depression among couples.

Keywords: Depression, Prevalence, Pattern, Polygamy, Monogamy, Rural Areas

1. Introduction

Depression is a mental illness of global concern, though sometimes vague in presentation, its effects are ghastly [1]. It is a broad and heterogeneous disorder characterized by persistently low mood and/or loss of interest in most activities [1]. According to American Psychiatry Association, symptoms of depression can vary from mild to severe and can also include changes in appetite (weight loss or gain unrelated to dieting), trouble in falling asleep or sleeping too much, increased fatigue, suicidal thoughts, increase in purposeless physical activities, slowed movement and speech, feeling worthless or guilty, difficulty in thinking and concentrating or making decisions [2]. Symptoms must last at least two weeks for a diagnosis of depression to be made. Depression can happen at any time but on the average, it first appears during the late teenage to mid-twenties [2]. when long-lasting and with moderate or severe intensity, depression may become a serious health condition [3]. The burden of depression and

other mental health conditions is on the rise globally. The World Health Organization has ranked depression as the fourth leading cause of disability worldwide [3]. Globally, more than 300 million people of all ages suffer depression. Depression affects an estimated 1 in 15 adults (6.7%) in any given year and 1 in 6 people will experience depression at some point in their lifetime [3].

Women are more likely to experience depression than men and it has been shown that one third of women will experience a major depressive episode in their lifetime [2, 4, 5]. Factors that play a role in the etiology and clinical manifestation of depression include biochemistry, genetics, personality, environmental factors amongst others. While changes in the level of neurotransmitters in the brain (like acetylcholine, serotonin, dopamine and others) may contribute to symptoms of depression, which have been found to run in some families [2]. Also, people with low self-esteem who are easily overwhelmed by stress, or who are generally pessimistic appear to be more likely to experience depression [2]. Another factor influencing the etiology of depression is the social environment of an individual as continuous exposure to neglect, abuse, violence or poverty might make some people more vulnerable to depression. Worthy of note is the type of family setting the individual belongs (i.e. monogamous and polygamous settings) [6].

Population studies have consistently shown that major depression is about twice as common in women as in men although it is still unclear why this is so [3, 7]. According to a 2015 global health estimate, 86 million (27%) people suffer depression in Western Pacific Region. In the Americas, a whopping 48.16 million (15%) people suffer from depression while in the Eastern Mediterranean Region, 26.19 million people (9%) suffer depression. An estimated 40.20 million people (12%) and 52.98 million people (16%) are affected in Europe and Africa respectively [8]. In Turkey, a study on the mental health aspects of Turkish women from polygamous versus monogamous families reported that there was a higher prevalence of depression among married women of polygamous setting than those of monogamous setting [6].

The type of family setting the individual belongs (i.e. monogamous and polygamous settings) has also been linked with depression [3]. Studies conducted in different countries have shown that polygamy can lead to co-wife jealousy, competition and unequal distribution of household and emotional resources, and generate acrimony between co-wives and between the children of different wives. They have also shown that polygamy is associated with mental illnesses (in particular, depression and anxiety) [9, 10]. In women, depression affects career, relationship, social life and sense of self-worth. This has a ripple effect in the family and society at large as mentally disabled women would concomitantly raise unstable children who would be a threat to the society [11].

In Turkey and some countries in the Middle East where monogamous and polygamous marriages are commonly practiced, studies have observed a link between the type of marriage settings women belong to and prevalence and pattern of depression [6]. In Sokoto and indeed Nigeria at large, studies on depression largely focused on its prevalence and pattern among general population; there is no record of any study within the study area that looked at depression among women in relation to the type of marriage setting they are living in (whether monogamous or polygamous), even though both types of marriages are common in the area. This study therefore, comparatively assessed the prevalence and pattern of depression among married women in monogamous and polygamous settings in a rural community of Sokoto state, north-west Nigeria.

2. Materials and Method

2.1. Study Area

The study was conducted in Bodinga Local Government Area (LGA), one of the 23 LGAs in Sokoto state. It is located about 15km away from Sokoto town, the capital of Sokoto State. Bodinga LGA has 11 political wards, including Bodinga/Tauma, Badau/Darhela, Bagarawa, Bangi/Dabaga among others. At growth rate of 3.01%, the population of Bodinga LGA is projected to be 264,832 in 2020 [12]. The major tribes are Hausa, Fulani, other tribes are Yoruba, Igbos etc and there are both Muslims and Christians living there, however, the majority are Muslims. Bodinga LGA has one General hospital, 15 primary schools, 10 secondary schools and one tertiary institution which offers Diploma in Islamic education and Arabic studies [12].

2.2. Study Design

It was a comparative cross-sectional study design involving women married in monogamous and polygamous marriage setting.

2.3. Study Population

This comprised of previously and currently married women residing in Bodinga Local Government Area of Sokoto state for a period not less than one year prior to the study (Inclusion criteria).

2.4. Sample Size Determination

The formula for determining sample size in a comparative study [13] was used to compute the sample size

$$n = \frac{2(Z_\alpha + Z_\beta)^2 p_1 q_1 + p_2 q_2}{(p_1 - p_2)^2}$$

$Z\alpha$=1.96

$Z\beta$=0.84

P_1=prevalence of depression among women in monogamous marriage [14]=18%=0.18

P_2=prevalence of depression among women in polygamous marriage [14]=36%=0.36

q_1=complimentary probability for factor under study among women in monogamous marriage

$(1 - p_1)$=1 – 0.18=0.82

q_2=complimentary probability for factor under study among women in polygamous marriage

$(1 - p_2)=1 - 0.36=0.64$

$$n = \frac{2(1.92 + 0.84)^2(0.18 \times 0.82) + (0.36 \times 0.64)}{(0.18 - 0.36)^2}$$

$$n = \frac{2(7.84)(0.1476) + (0.2304)}{(-0.18)^2}$$

$$n = \frac{15.68 \times 0.378}{0.0324}$$

$$n = \frac{5.927}{0.0324}$$

n=182.9

To adjust for non-response, the minimum sample size "n" was divided by estimated response rate (95%=0.95) as follows

$$\text{Adjusted sample size}=\frac{183}{0.95}$$

$$=192.63$$

$$\approx 193 \text{ per group}$$

2.5. Sampling Technique

Multistage sampling technique was used to select the study participants as follows:

Stage 1: Out of the three senatorial zones in Sokoto state (Sokoto East, Sokoto Central and Sokoto South), one senatorial zone (Sokoto South) was selected using simple random sampling technique, by balloting procedure.

Stage 2: Out of the seven LGAs in Sokoto south senatorial zone, one LGA (Bodinga LGA) was selected using simple random sampling technique, by balloting procedure.

Stage 3: Bodinga LGA has 11 polical wards and out of these wards, one political ward (Bodinga/Tauma) was selected using simple random sampling technique by balloting procedure.

Stage 4: Five settlements in Bodinga/Tauma ward (namely Bare-Bari, Shiyarsarki, Makera, Shiyarfulani and Yargatari) were selected using simple random sampling technique by balloting procedure.

In each of the selected settlements, house numbering was done with identification of houses that are into monogamous or polygamous marriages, after which proportionate allocation of samples was made for each settlement.

Stage 5: From each of the selected settlement, a central location was identified and with a spin of a bottle, the nearest house was first chosen. Thereafter, consecutive houses were visited to identify eligible households and respondents.

These steps were followed to select respondents in both monogamous and polygamous marriage setting until minimum required sample size in each group was obtained. For respondents married in polygamous setting however, simple random sampling technique by balloting was used to select one woman for the study.

2.6. Instrument / Method of Data Collection

Data was collected using a pretested structured questionnaire which was uploaded on open data kit (ODK) version 1.23.2. The questionnaire had three sections with thirty-three stem questions.

Section A: Contained questions on socio-demographic profile of respondents, section B: Contained questions on prevalence and risk factors of depression, section C: Contained questions on pattern of depression which was adapted from the Patient Health Questionnaire version nine (PHQ-9), a standardized multipurpose instrument for screening, monitoring and measuring the severity of depression [15].

The questionnaire was administered to each eligible respondent at home, after seeking for their consent; the data collection lasted for a period of eight days.

2.7. Personnel/Training

Thirteen research assistants comprising of three 600 level medical students (2 males and 1 female student) and ten 300 level medical students (all females) were trained by the researcher. The training was for a period of two days and it covered general overview of the family social group, depression, questionnaire/survey instruments, sampling techniques, field activities, ethics of fieldwork, general principles of research, interpersonal communication skills and the use of ODK for data collection.

2.8. Pretest

The questionnaire (uploaded on ODK) was pretested on 40 married women (20 in monogamous marriage and 20 in polygamous) selected from Kalambaina town in Wamakko LGA of Sokoto state. This allowed for further assessment and modification of the study instruments and the conduct of the study.

2.9. Data Analysis

Data was exported from the ODK server to Microsoft excel 2016, and transferred to IBM SPSS version 20 for analysis. Continuous variables were summarized as mean and standard deviation (SD) while categorical variables were presented as frequencies and percentages. Chi-square test was used to test the significance of association between categorical variables while logistic regression was used to determine the predictors of depression. Results were presented in tables and figures; level of significance was set at 5% ($p<0.05$).

2.10. Ethical Consideration

Ethical approval was obtained from Sokoto State Ministry of Health Research Ethics Committee (HREC). Individual informed verbal consent was also obtained from the respondents before the questionnaire was administered, all data obtained were handled with utmost confidentiality.

3. Results

Out of 386 questionnaires that were administered, 6 questionnaires were removed because the interviews were not completed, thus, 378 forms were analyzed giving 97.9% response rate.

The ages of respondents in both the monogamous and polygamous groups ranged from 17 to 76 years. The mean age of the respondents in the monogamous group was 33.91±6.8, while that of respondents in the polygamous group was 35.27±8.3, there was no significant difference in the mean age of the respondents in both groups (t=1.189, p=0.235). Those within 20-29 year age group constituted the highest proportion of respondents in both groups (monogamous 38.3%, polygamous 32.4%). There was no statistically significant difference in the age distribution of respondents in the two groups (X^2=2.278, P=0.890). Majority of the respondents in both groups were married (monogamous 92.2%, polygamous 89.2%). All the respondents in both groups (100%) were Muslims and in terms of their distribution by tribe, there were more respondents from the Hausa tribe in the polygamous group (90.3%) than in the monogamous group (81.9%); the difference in their distribution was statistically significant (X^2=6.08, P=0.033). More than half of the respondents in both monogamous and polygamous groups had no formal education [109 (56.5%) and 107 (57.8%) respectively, p=0.227] and in terms of their occupation, petty trading constituted the highest proportion in both groups [monogamous 114 (59.1%), polygamous 97 (52.4%)]. (Table 1).

Table 1. *Socio-demographic characteristics of respondents in rural areas of Sokoto State.*

Variable	Type of family setting		Test statistic
	Monogamous N=193 (%)	Polygamous N=185 (%)	
Age (in years)			
<20	6 (3.1)	9 (4.9)	
20-29	74 (38.3)	60 (32.4)	
30-39	46 (23.8)	49 (26.5)	X^2=2.278
40-49	28 (14.5)	31 (16.8)	P=0.890
50-59	25 (13.0)	23 (12.4)	
60-69	10 (5.2)	9 (4.9)	
70-79	4 (2.1)	4 (2.2)	
Marital status			
Married	178 (92.2)	165 (89.2)	X^2=1.081
Widowed	10 (5.2)	14 (7.6)	P=0.582
Separated	5 (2.6)	6 (3.2)	
Tribe			
Hausa	158 (81.9)	167 (90.3)	X^2=6.08
Fulani	30 (15.5)	13 (7.0)	P=0.033
Others	5 (2.6)	5 (2.7)	
Religion			
Islam	193 (100)	185 (100)	N/A
Christianity	0	0	
Others	0	0	
Educational status of respondents			
No formal education	109 (56.5)	107 (57.8)	X^2=4.340
Primary school certificate	32 (16.6)	40 (21.6)	P=0.227
Secondary school certificate	48 (24.9)	32 (17.3)	
Tertiary certificate	4 (2.1)	6 (3.2)	
Educational status of respondent's husband			
No formal education	42 (21.8)	55 (29.7)	X^2=3.731
Primary school certificate	29 (15.0)	24 (13.0)	P=0.292
Secondary school certificate	38 (19.7)	38 (20.5)	
Tertiary certificate	84 (43.5)	68 (36.8)	
Occupation of respondents			
Housewife	45 (23.3)	63 (34.1)	
Petty trader	114 (59.1)	97 (52.4)	X^2=5.767
Tailor	13 (6.7)	12 (6.5)	P=0.217
Civil servant	3 (1.6)	2 (1.1)	
Others	17 (8.8)	11 (5.9)	
Occupation of respondents' husband			
Farmer	14 (7.3)	25 (13.5)	
Trader	58 (30.1)	48 (26.0)	
Artisan/Vocational worker	17 (8.8)	27 (14.6)	X^2=14.768
Civil Servant	60 (31.1)	59 (31.9)	P=0.022
Law enforcement agent	1 (0.5)	4 (2.2)	
Unemployed	11 (5.7)	6 (3.2)	
Others	32 (16.6)	16 (8.6)	
Duration of marriage (in years)			X^2=2.153
0-10	74 (38.3)	67 (36.2)	P=0.905

Variable	Type of family setting		Test statistic
	Monogamous N=193 (%)	Polygamous N=185 (%)	
11-20	54 (30.0)	50 (27.0)	
21-30	31 (16.1)	31 (16.8)	
31-40	27 (14.0)	25 (13.5)	
41-50	3 (1.6)	7 (3.8)	
51-60	3 (1.6)	4 (2.2)	
61-70	1 (0.5)	1 (0.5)	

Overall prevalence of depression in both groups was 52.1% (N=197), of which 28.0% (N=106) was among monogamous and 24.1% (N=91) among polygamous group. There was no statistically significant difference between the two groups (X^2=0.788, p=0.375) [Figure 1].

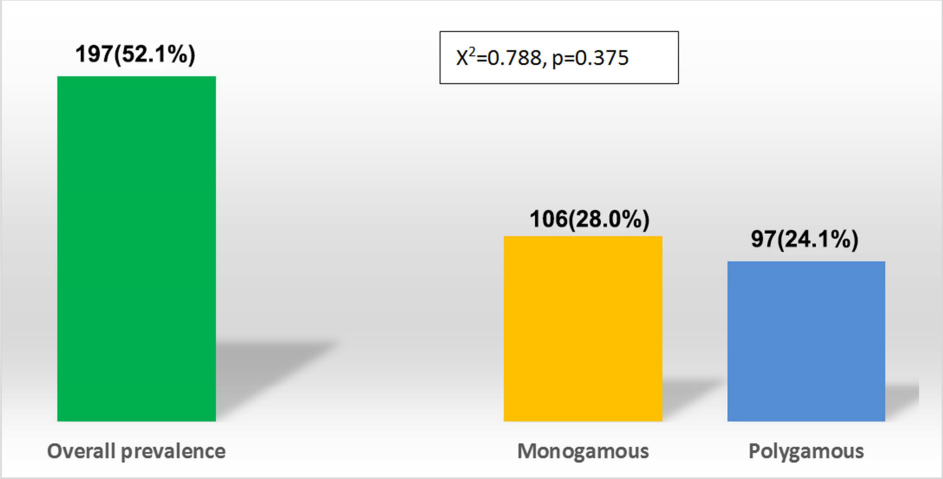

Figure 1. *Overall prevalence of depression, prevalence of depression in monogamous and polygamous marriages among the respondents in rural areas of Sokoto State.*

Of the 52.1% respondents with depression in both groups, 95 (25.2%) had mild depression, 56 (14.8%) had moderate depression while 14 (3.6%) had severe depression (Figure 2).

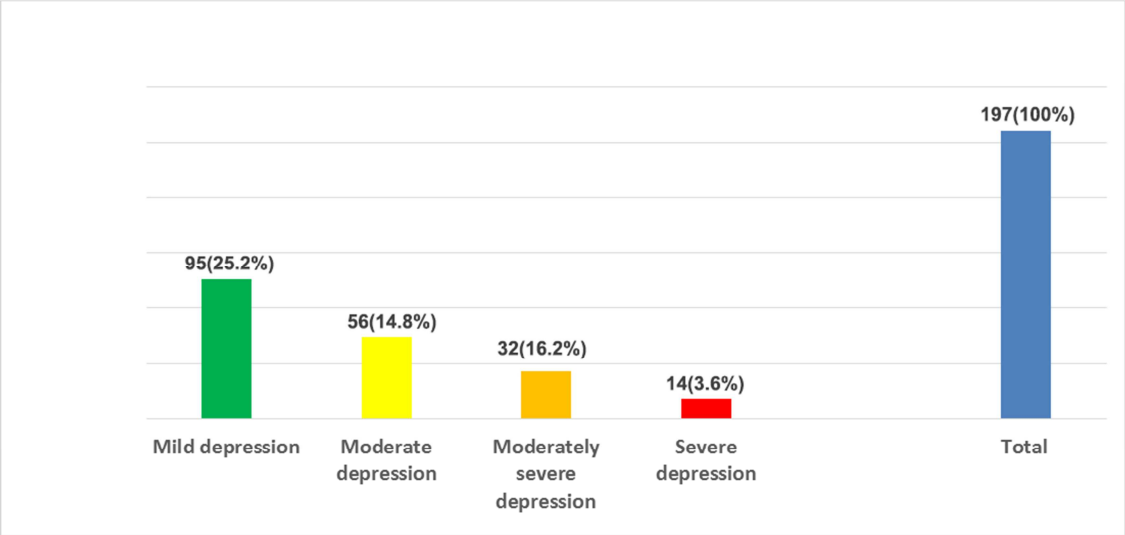

Figure 2. *Prevalence of the different types of depression among respondents in rural areas of Sokoto State.*

Regarding types of depression according to marriage setting, 46 (43.1%) and 49 (54.3%) of respondents in monogamous and polygamous groups respectively had mild depression, 37 (34.9%) in monogamous and 20 (21.3%) in polygamous group had moderate depression whereas 5 (4.6%) in monogamous and 9 (9.6%) in polygamous group had severe depression. There was no statistically significant difference in the distribution depression by type according to marriage setting (X^2=7.336, p=0.119) [Figure 3].

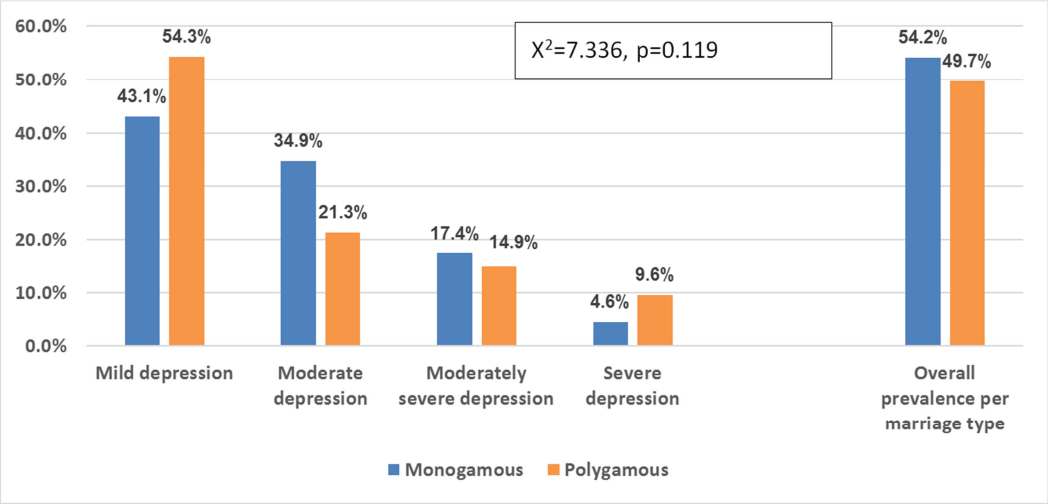

Figure 3. *Prevalence and distribution of types of depression according to marriage setting among respondents in rural areas of Sokoto State.*

Depressive symptoms experienced nearly everyday by respondents included feeling hopeless and down [monogamous 33 (16.6%) vs. polygamous 18 (9.6%)]; having difficulty falling asleep [monogamous 32 (15.9%) vs polygamous 26 (13.8%)]; feeling tired [monogamous 56 (28.0%) vs polygamous 42 (22.2%)] and having trouble concentrating on things like watching TV [monogamous 27 (13.5%) vs polygamous 24 (12.8%)]; however, there was no statistically significant difference in their distribution between the two groups (p>0.05). The only depressive symptom that was significantly associated with type of marriage setting was loss of appetite; up to 21 (10.4%) of respondents in monogamous marriage setting said they had loss of appetite for at least seven days within the past two weeks whereas in the polygamous group only 5 (2.6%) loss of appetite (X^2=12.419, P=0.006). [Table 2]

Table 2. *Pattern of depression among respondents in rural areas of Sokoto State.*

Variable	Type of family setting		Test statistic (X^2)
	Monogamous setting (%)	Polygamous setting (%)	
Having little interest in the things you used to do before			
Not at all	110 (55.0)	106 (56.7)	X^2=1.142
Rarely	43 (21.5)	45 (24.1)	P=0.765
About seven days	13 (6.5)	10 (5.3)	
Nearly everyday	34 (17.0)	26 (13.9)	
Feeling hopeless and down			
Not at all	108 (54.3)	110 (58.5)	X^2=6.050
Rarely	40 (20.1)	48 (25.5)	P=0.111
About seven days	18 (9.0)	12 (6.4)	
Nearly everyday	33 (16.6)	18 (9.6)	
Having trouble falling asleep or sleep too much			
Not at all	123 (61.2)	108 (57.4)	X^2=1.803
Rarely	34 (16.9)	40 (21.3)	P=0.619
About seven days	12 (6.0)	14 (7.4)	
Nearly everyday	32 (15.9)	26 (13.8)	
Having poor appetite or eat slowly			
Not at all	108 (53.7)	126 (66.7)	X^2=12.419
Rarely	36 (17.9)	28 (14.8)	P=0.006
About seven days	21 (10.4)	5 (2.6)	
Nearly everyday	36 (17.9)	30 (15.9)	
Feeling tired			
Not at all	91 (45.5)	81 (42.9)	X^2=3.789
Rarely	38 (19.0)	49 (25.9)	P=0.287
About seven days	15 (7.5)	17 (53.1)	
Nearly everyday	56 (28.0)	42 (22.2)	
Feeling like a failure			
Not at all	145 (72.1)	122 (64.9)	X^2=2.429
Rarely	30 (14.9)	35 (18.6)	P=0.496
About seven days	6 (3.0)	8 (4.3)	
Nearly everyday	20 (10.0)	23 (12.2)	
Having trouble concentrating on things like watching T. V etc			X^2=5.627
Not at all	128 (64.0)	102 (54.3)	P=0.133

Variable	Type of family setting		Test statistic (X^2)
	Monogamous setting (%)	Polygamous setting (%)	
Rarely	34 (41.0)	49 (26.1)	
About seven days	11 (17.0)	13 (6.9)	
Nearly everyday	27 (13.5)	24 (12.8)	
Move or speak slowly			
Not at all	135 (67.5)	138 (73.0)	X^2=3.714
Rarely	28 (14.0)	28 (14.8)	0.301
About seven days	9 (4.5)	8 (4.2)	
Nearly everyday	28 (14.0)	15 (7.9)	
Thinking about commiting suicide??			
Not at all	173 (86.1)	163 (86.2)	X^2=3.320
Rarely	11 (5.5)	13 (6.9)	P=0.355
About seven days	8 (4.0)	10 (5.3)	
Nearly everyday	9 (4.5)	3 (1.6)	

Regarding reasons for sadness among respondents, 3 (4.1%) of those in the monogamous group said the reason for their sadness was because their husbands refused to take care of the kids but in the polygamous group up to 16 (21.9%) said they were sad for the same reason (X^2=6.146, p=0.015). Other reasons for sadness expressed by respondents include husband having affair with another woman [monogamous 1 (1.4%) vs polygamous 2 (2.7%); p=1.000], husband prioritizing co-wife [monogamous 0 (0) vs polygamous 11 (15.1%); p=0.005], and husband not satisfying wife sexually [monogamous 2 (2.7%) vs polygamous 2 (2.7%); p=1.000] (Table 3).

Table 3. *Reasons for sadness among respondents in rural areas of Sokoto State.*

Variable	Type of marriage		Test statistic
	Monogamy	Polygamy	
My husband refused to take care of my kids	3 (4.1)	16 (21.9)	X^2=6.146, p=0.015
My husband was having affair with another woman	1 (1.4)	2 (2.7)	p=1.000 Fisher's exact
My husband prioritized my co-wife	0 (0)	11 (15.1)	X^2=8.536, p=0.005
My husband does not love me anymore	1 (1.5)	8 (11.0)	X^2=3.510, p=0.078
My husband beats me	0 (0)	1 (1.4)	P=1.000 Fisher's exact
Husband does not satisfy me sexually	2 (2.7)	2 (2.7)	X^2=0.187, P=1.000

The highest prevalence of depression among the women in monogamous setting was found within the age group 40-49 years (60.7%) while the highest for women in polygamous setting was within the age groups 60-69 years (77.8%); there was however, no statistically significant association between depression and age in both settings (P=0.155). There was statistically significant relationship between marital status and depression among women married in polygamous setting (X^2=10.837 P=0.002). [Table 4]

Table 4. *Factors associated with depression in both groups.*

Variable	Type of family setting			
	Monogamy		Polygamy	
	Depression	No depression	Depression	No depression
Age in years				
<40	65 (51.6)	61 (48.4)	59 (50.0)	59 (50.0)
≥40	38 (56.7)	29 (43.3)	35 (52.2)	32 (47.8)
	X^2=0.462	P=0.542	X^2=0.086	P=0.878
Marital Status				
Married	92 (51.7)	86 (48.3)	78 (46.4)	90 (53.6)
Widowed	7 (70.0)	3 (30.0)	12 (75.0)	4 (25.0)
Separated	4 (80.0)	1 (20.0)	6 (100.0)	0 (0.0)
	X^2=2.739	P=0.281	X^2=10.837	P=0.002
Tribe				
Hausa	83 (52.5)	75 (47.5)	88 (51.8)	82 (48.2)
Fulani	17 (56.7)	13 (43.3)	4 (26.7)	11 (73.3)
Others	3 (60.0)	2 (40.0)	4 (80.0)	1 (20.0)
	X^2=0.26 4	P=0.898	X^2=5.258	P=0.090
Religion				
Islam	103 (53.4)	90 (46.6)	96 (50.5)	94 (49.5)
Christianity	0 (0)	0 (0)	0 (0)	0 (0)
Respondent Education				
No formal education	58 (53.2)	51 (46.8)	56 (51.4)	53 (48.6)
Formal education	45 (53.6)	39 (46.4)	40 (49.4)	41 (50.6)
	X^2=0.002	P=1.000	X^2=0.074	P=0.883
Respondents' husband education				

Variable	Type of family setting			
	Monogamy		Polygamy	
	Depression	No depression	Depression	No depression
No formal education	18 (42.9)	24 (57.1)	27 (48.2)	27 (51.8)
Formal education	85 (56.3)	66 (43.7)	68 (51.5)	64 (48.5)
	X^2=2.383	P=0.162	X^2=0.035	P=0.873
Occupation of respondent				
Housewife	24 (53.3)	21 (46.7)	28 (43.8)	36 (56.2)
Petty trader	64 (56.1)	50 (43.9)	51 (51.5)	48 (48.5)
Tailor	5 (38.5)	8 (61.5)	6 (46.2)	7 (52.8)
Civil servant	1 (33.3)	2 (66.7)	1 (50.0)	1 (50.0)
Others	8 (47.1)	9 (52.9)	10 (83.3)	2 (16.7)
	X^2=2.263	P=0.691	X^2=6.481	P=0.154
Occupation of respondent husband				
Employed	98 (51.0)	84 (49.0)	91 (52.6)	82 (47.4)
Unemployed	5 (45.5)	6 (54.5)	4 (66.7)	2 (33.3)
	X^2=0.294	P=0.758	X^2=0.461	P=0.686
Duration of marriage in years				
≤30	86 (54.1)	73 (45.9)	73 (45.6)	87 (54.4)
>30	17 (50.0)	17 (50.0)	22 (59.5)	15 (40.5)
	X^2=0.188	P=0.708	X^2=2.304	P=0.147

Being sad for a long period was significantly associated with depression in both groups (p<0.001) and having family history of depression (p=0.004 and p=0.032 respectively). Other factors such as sociodemographic factors, smoking cigarette and consumption of alcohol were not found to have any statistically significant association with prevalence of depression among respondents (p>0.05). [Table 5]

Table 5. *Factors associated with depression in both groups.*

Variable	Type of family setting			
	Monogamy		Polygamy	
	Depressed	Not Depressed	Depressed	Not Depressed
Have you been sad for a long period of time that no one could help you?				
Yes	71 (68.9)	32 (31.1)	56 (68.3)	26 (31.7)
No	31 (35.2)	57 (64.8)	40 (37.0)	68 (63.0)
	X^2=21.64	P<0.001	X^2=18.216	P<0.001
Do you smoke cigarettes?				
Yes	3 (100.0)	0 (0.00)	4 (100.0)	0 (0.00)
No	99 (53.0)	87 (46.8)	91 (49.2)	94 (50.8)
	X^2=2.600	P=0.251	X^2=4.043	P=0.121
Do you drink alcohol?				
Yes	0 (0.00)	0 (0.00)	1 (100.0)	0 (0.00)
No	103 (53.9)	88 (46.1)	94 (50.3)	93 (49.7)
	N/A		X^2=0.984	P=1.000
Does your husband smoke cigarettes?				
Yes	27 (75.0)	9 (25.0)	22 (66.7)	11 (33.3)
No	76 (48.4)	81 (51.6)	72 (46.5)	83 (53.5)
	X^2=8.321	P=0.005	X^2=4.447	P=0.054
Does your husband drink alcohol?				
Yes	0 (0.00)	0 (0.00)	2 (100.0)	0 (0.00)
No	103 (53.4)	90 (46.6)	92 (49.5)	94 (50.5)
	N/A		X^2=2.022	P=0.497
Any family history of mental illness?				
Yes	32 (72.7)	12 (27.3)	22 (68.8)	10 (13.2)
No	70 (47.6)	77 (52.4)	74 (46.8)	84 (53.2)
	X^2=8.579	P=0.004	X^2=5.112	P=0.032

Predictors of depression in both groups were marital status [monogamous (OR=0.229, p=0.024, 95% CI=0.064-0.823) Vs. polygamous (OR=0.252, p=0.009, 95% CI=0.089-0.714)], being sad for long time [monogamous (OR=3.427, p<0.001, 95% CI=1.766-6.649) Vs. polygamous (OR=3.818, p<0.001, 95% CI=1.900-7.671)] and having loss of interest in doing things as previously done [monogamous (OR=17.462, p<0.001, 95% CI=5.088-59.929) Vs. polygamous (OR=21.599, p<0.001, 95% CI=4.818-96.820)] (Table 6).

Table 6. *Predictors of depression among respondents married in monogamous and polygamous setting.*

Predictor	Monogamous				Polygamous			
	aOR	95% CI		p value	aOR	95% CI		p value
		lower	upper			lower	upper	
Marital status (Being married)	0.229	0.064	0.823	0.024	0.252	0.089	0.714	0.009
Being very sad for a long time	3.427	1.766	6.649	<0.001	3.818	1.900	7.671	<0.001
Family history of mental illness	1.930	0.774	4.814	0.158	1.657	0.708	3.877	0.254
History of loss of interest in doing things as previously done	17.462	5.088	59.929	<0.001	21.599	4.818	96.820	<0.001

aOR=adjusted Odds Ratio CI=Confidence Interval *=Reference group

4. Discussion

This study was conducted among women who were ever married either in polygamous and monogamous setting in Bodinga Local Government Area of Sokoto State, to determine the prevalence, pattern, and risk factors associated with depression among women in the study area.

In this study, respondents with the highest proportion were those within 20 to 29 years age group in both monogamous (38.3%) and polygamous settings (32.4%); with mean ages of 33.91 +/6.8 years for women in monogamous setting and 35.27+/-8.3 for women in polygamous setting. This finding is similar to the findings of a study by Ozkan et al on mental health aspects of Turkish women married in polygamous versus monogamous settings, which also reported that those aged between 20 to 29 years constituted the highest proportion of their respondents [6]. These findings may be attributed to the fact that most marriages among women occur within this age group. More than half of the respondents in both groups had no formal education [109 (56.5%) vs 107 (57.8%)] for both women in polygamous and monogamous settings. This is not surprising because in Sokoto state, up to 88.4% of women have no education and only 3.2% have educational attainment beyond secondary school; this is the lowest in the country [16].

Furthermore, husbands who had no formal education in monogamous setting constituted (21.8%) as compared to those in polygamous settings (29.7%). This is in contrast to the findings of a study by Al-Krenawi et al, which was carried out in an outpatient psychiatry clinic. The study reported that women in polygamous settings were less educated than those in monogamous settings and among men, those in polygamous setting had lower educational attainment [9]. In this study, respondents in both marriage settings were predominantly Muslims (100%) and this is probably due to the fact that the study area (Sokoto state) is located in North West geo-political zone, a zone which is predominantly inhabited by Muslims [16].

The overall prevalence of depression (in both monogamous and polygamous groups) in this study was 52.1%. This prevalence is quite high, however, it is lower than the prevalence rate of 59.6% reported by Afolabi et. al in Osogbo southwest Nigeria [17]. The prevalence of depression in this study is nevertheless, high when compared to the prevalence of depression observed in a study on depressive disorders among pregnant women in Sagamu, south-west Nigeria [18], which reported prevalence of 29.1%. The lower prevalence observed in the study in Sagamu could be attributed to the fact that the study was hospital based as against our study, which was community based, thus more likely to detect hidden cases of depression within the community. Our findings may follow the "Iceberg Phenomenon" of disease, in which only the symptomatic cases are seen in the hospital, the vast majority (mainly asymptomatic cases) remain undetected within the community [19].

Out of the 52.1% of the respondents that had depression, 28% were those married in monogamous setting, which is slightly higher than the prevalence rate among those married in polygamous setting (24.1%). This finding is contrary to the findings of a study conducted in Turkey which reported a lower prevalence of depression among women in monogamous setting (18%), however, in the same study in Turkey, the prevalence rate among those married in polygamous setting was 40%, which is much higher than the 24.1% observed in this study [6]. Another study conducted in north-central Nigeria also observed similar pattern where prevalence of depression was higher among women married in polygamous setting than in monogamous setting [20]. The lower prevalence observed in our study among those in polygamous marriages may not be unrelated to the fact that polygamous marriages are highest in the northwest region of Nigeria [21] (47.5%), thus making the women in this part of the country probably better adapted to marriages in polygamous settings than women in Turkey; moreover, polygamous marriage is illegal in Turkey [22], therefore, women who finds themselves in such relationship may likely be more prone to depression.

On the pattern of depression observed in this study, overall prevalence of mild depression in both groups was 25.2%, however, among those in monogamous setting, the proportion of those with mild depression was 43.1% whereas among those in polygamous setting, the proportion with mild depression was 54.3%. The overall prevalence of mild depression (25.2%) observed in this study is low when compared to the 42.8% reported by Afolabi et al in a study on the pattern of depression among patients in a Nigerian family practice clinic [17]. A much higher prevalence of mild depression was reported in a study on prevalence of depression in a Primary Health Care setting in North Central Nigeria which was as high as 84.9% [20]. Reasons for the disparity could be explained by the fact that different denominators were used between this study and the other two

studies; in our study, the denominator constituted all the respondents (N=378) whereas the other studies looked at the prevalence of mild depression among those with depression.

Overall prevalence of moderate depression was 14.8% out of which the proportion among those in monogamous setting was 34.9% and 21.3% among those in polygamous setting. This finding (14.8% prevalence of moderate depression) is similar to the findings of Sanni et al [20] who observed a prevalence of 14.2% in Illorin, Nigeria, however, a slightly higher prevalence of moderate depression (16%) was reported by Afolabi et al in their study from Osogbo, southwest Nigeria [17]. In a study conducted in the United States of Americaby Dolittle and Farrel [23], a much higher prevalence of moderate depression (22%) was observed; the differences between the observed prevalence in this study and the values reported in other studies both within and outside Nigeria may reflect a variation in local factors influencing depression in the various communities, as has also been suggested by Judd et al [24]. The overall prevalence of severe depression was 3.6%, however, the proportion among women in monogamous setting was 4.6% while among those married in polygamous setting, the proportion with severe depression was 9.6%. This finding is higher than the prevalence of severe depression (0.94%) observed in a psychiatric clinic in North Central Nigeria [20].

Among women in polygamous settings, there was a statistically significant association between dispute with co-wife and depression. This finding is consistent with that of Al-krenawi which was carried out among women from monogamous and polygamous marriages in an outpatient psychiatric clinic in Ar-Raqqah, north-central Syria, which reported a statistically significant association between dispute among co-wives and depression [9]. Among the reasons given by women married in polygamous settings for their sadness were poor welfare from the husband, uneven distribution of resources among co-wives by husband, jealousy, marital insecurity and dispute between co-wives. These findings are in keeping with the findings of Al-Krenawi, which attributed depression in polygamous setting to jealousy, uneven distribution of resources and competition among co-wives [9]. Even though this study did not look at pattern of depression among co-wives, especially between 1st wife and other co-wives, studies conducted in Turkey and Egypt found that senior wives in polygamous families experienced a major psychological crisis, which manifests itself in somatic complaints as well as in psychological symptoms such as anxiety, depression and irritability following their husbands' second marriage [6, 10].

On bivariate analysis, factors associated with depression were marital status, being sad for a long time and having family history of depression. On multivariate regression analysis however, significant predictors of depression were marital status and being sad for a long time. In this study, respondents who were married were found to be about four times less likely to develop depression in both groups. In the study from the north-central part of Nigeria it was reported that being married or the type of marriage did not confer protection against depression. It is believed that marriage in itself does not does not confer any protect against depression but rather it is the quality of emotional and social support that married partners derive from each other that confers protection [20]. Although family history of depression was found to be associated with depression among women in monogamous setting, it was not found to be a significant predictor of depression. In a related study conducted in Slovenia, Zalar et al opined that "no evidence of a link between the presence of putative high risk alleles and the likelihood of either having depression or having a family history of depressive disorder" [25]. In a systematic review on prevalence and correlates of depression among Australian women by Rich et al [26], family history of mental illness was found to be a significant correlate of depression. These conflicting findings regarding possible link of depression and family history probably suggests that social rather than biological factors have more influence on depression. Other studies on possible link of some genetic factors and development of major depressive disorders also found conflicting results [27, 28].

5. Limitations of the Research

A major limitation of this study was the paucity of researches pertaining the prevalence and pattern of depression in relation to family setting (monogamous and polygamous), thus most of the findings of this study were compared with studies on the prevalence and pattern of depression among the general population. Also, this study did not look at pattern of depression among co-wives in polygamous families, thus there is need for further research in this area, especially in north-west Nigeria, where the prevalence of polygamous marriage is very high.

6. Conclusion and Recommendation

The overall prevalence of depression was high in this study and the prevalence was slightly higher in monogamous group than polygamous marriages; most respondents in both groups had mild depression. Being sad for most of the days was among the major symptoms experienced by respondents and part of the reasons given by respondents for their sadness included poor welfare from the husband, uneven distribution of resources among co-wives by husband, jealousy, marital insecurity and dispute between co-wives. Significant predictors of depression include marital status and being sad for long time. Given the high prevalence of depression in this study, there is need for government and other partners to strengthen mental health services at community levels to enable early detection and management of depression among couples. There is also need for further research to look at pattern of depression among co-wives in polygamous family settings, especially in north-west Nigeria, where the prevalence of polygamous marriage is very high.

Contribution of Authors

Adamu H and Oche MO conceived the initial idea for the manuscript. Abel RH, Garba KA and Zubairu BB took part in the design of the questionnaire, the data collection, analysis and wrote the first draft of the manuscript under the supervision and guidance of Adamu H and Oche MO. All the authors contributed to the revision of the manuscript and approved the final manuscript.

Conflict of Interest

The authors declare that they have no competing interests.

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