Analysis on the predictors of knowledge of medication adherence among care-givers of patients with Schizophrenia in some selected Hospitals of Jigawa State, Nigeria

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ABSTRACT: *Family caregivers of persons with bipolar disorder and schizophrenia experience high level of burden and compromised quality of life. A considerable amount of burden on the caregivers often leads to display of certain attitudes towards persons with severe mental illness called expressed emotion, which then leads to poor quality of patients as well. Although numerous studies dealing with these issues separately are present, but studies dealing with relationship, using mixed methodology, among these issues are scarce. Adherence to a drug regime is a significant issue in the clinical management of schizophrenia. A study of adherence in bipolar disorder showed that slightly more than one-half of the patients studied were fully adherent, 20% were partially adherent, and nearly 30% were non-adherent. Risk factors for non-adherence in this group included younger age, minority status, substance abuse, and homelessness (Shehu, et al., 2019). This study assessed and Analysis on the predictors of good knowledge of medication Adherence among care- givers of patients with Schizophrenia in some selected Hospital of Jigawa State, Nigeria. A quasi-experimental psycho-educational intervention study was conducted with before and after design among care givers of patients with Schizophrenia in some selected hospitals of Jigawa State, Nigeria. The study population comprised all the eligible care- givers of patients with schizophrenia within the study area, who were selected and agreed to participate in the study. A sample size of one hundred and thirty participants each for both the experimental and control groups were*

selected using a multistage sampling technique. Data was collected using Questionnaire Data collected was coded, entered, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 22. After adjusting for the confounding effects using logistic regression analysis; type of treatment (ECT) was found to be negative predictors of good knowledge on medication adherence to treatment among study participants (AOR=0.50, 95%CI=0.27 – 0.85). While, cost of treatment of more than one thousand five hundred naira per day (AOR=2.5, 95%CI=2.11 – 8.33), combination of drugs and ECT (AOR=3.01, 95%CI=1.85 – 14.76), presence of side effects (AOR=4.00, 95%CI=2.05-21.55) and monthly income (AOR=3.00, 95%CI=1.01-15.88) were positive predictors of good knowledge on medication adherence among the study participants in the experimental groupSocial support had a significant correlation with caregivers' QoL. Caregivers should be encouraged to request assistance from other family members and friends in providing care, especially when caregivers are unemployed or long-time carers. Mental health education campaigns and helping families to maintain and enhance a supportive social network may provide useful means to improve caregivers.

KEYWORDS: analysis, care givers, hospital, Schizophrenia, Jigawa.

INTRODUCTION

Schizophrenia is among the commonest psychiatric disorders, affecting approximately 1% of the world's population and is among the leading cause of disability (National Health Service, 2019; Shehu et al., 2019). It is also associated with increased rates of co-morbidities, like cardiovascular disorders, diabetes mellitus, hypertension, hyper-lipidaemia, and other mental illnesses e.g., anxiety, depression, substance abuse (Markowitz et al., 2013). Globally, it is associated with considerable disability and may affect educational and occupational performance. People with schizophrenia are 2-3 times more likely to die early than the general population. This is often due to preventable physical diseases, such as cardiovascular disease, metabolic disease and infections (World Health Organization, 2015). World Health Organization reported that 450 million individuals lived with mental health disorders worldwide (World Health Organization, 2001). A meta-analysis of mental health surveys across 59 countries between 1980 and 2013 estimated the pooled lifetime prevalence of common mental disorders among adults aged 16–65 was 29.2% (Steel et al., 2014). In China, lifetime prevalence rates for common mental disorders, which were likely biased downwards, were at least 13.2%. (Kessler et al., 2009). A report from the Chinese Center for Disease Control and Prevention (CDC) in, 2015 stated that more than 173 million individuals lived with mental disorders in China (Chinese Center for Disease Control and Prevention, 2015), and the CDC estimated that 16 million patients were diagnosed with a serious mental illness (SMI) in 2013 (Chinese Center for Disease Control and Prevention, 2011). Also in 2013, the World Health Assembly adopted the Comprehensive Mental Health Action Plan 2013–2020 to expand community-based mental health care services and to change the attitudes towards mental health

in countries around the world. Moving away from wholly medical models, the Plan addressed education opportunities and income generation, housing and social services, and other social determinants of mental health (Thomas, 2013), which focused attention on the role of caregivers of family members with SMI. For people with mental illnesses, family caregivers take the most prominent role in care giving (Huang et al., 2009). Family caregivers (Leng et al., 2019).Care within family settings means that the impact of care- giving on caregiver's mental and physical health and quality of life (QoL) should not be overlooked (Huang et al., 2009). QoL is a multidimensional concept including subjective and objective evaluations of a caregiver's mental, physical and social well-being state (World Health Organization, 2004). The World Health Organization has defined QoL as "The individual's perception of his or her position in life, within the cultural context and value system he/she lives, and in relation to his/ her goals, expectations, parameters and social relations" (The WHOQOL Group, 1995). In a review of the caregiver literature, Caqueo-Urízar, Gutiérrez-Maldonado, and Miranda-Castillo (2009) concluded that informal caregivers experience negative changes to their QoL. A range of stresses related to the care-giving role can negatively influence the QoL of caregivers, including significant financial burdens, difficulties handling patient's disruptive behavior and uncontrollable patient emotions (Sales, 2003), a lack of time for personal entertainment and social engagement (Keung, Kit, Chan, & Fan, 2012), stigma and isolation (Chien, Chan, & Morrissey, 2007), and reduced time for full or parttime work. For example, research suggests that the incidence of caregivers developing depression is as much as 5-fold higher than that of the general population (Kessler, Chiu, Demler, & Walters, 2005; Lu et al., 2007). These negative impacts have been conceptualized as the "caregiver burden" (Vella & Pai, 2013) and are associated with caregivers' declining health status, depressive symptoms, inadequate social support and financial costs (Chien et al., 2007). From the critical review of the pre-2009 literature on Chinese caregivers in families with mental illness, most articles focused on the QoL and social support of those caring for patients with schizophrenia in Hong Kong and Taiwan (Hsiao & Van, 2010). More recently, Chinese research has also studied family caregivers of patients with schizophrenia in the major urban centers of Guangzhou and Beijing (Caqueo- Urízar et al., 2009; Li, Fan, Chen, & Yang, 2008; Yan, Guo, & Wang, 2008; Zeng et al., 2016). While studies of Chinese caregivers of patients with schizophrenia have noted that caregivers' demographic characteristics, such as income and education, can be correlative factors to the psychological and physical caregiver burden (Li et al., 2008; Yan et al., 2008), the role of social support has not been investigated. In contrast, western research on caregivers to family members with SMI found that insufficient social support, followed by the caregiver burden, were the most significant correlative factors of caregiver depression (Saunders, 2003). Across diverse cultures, Chan found that social support was a significant protective factor affecting the caregiver burden (Chan, 2011). Further research on the social support and QoL of caregivers can inform clinical care and policy decision-making (Awad, Voruganti, & Heslegrave, 1997), especially in mainland China. Therefore, this paper has two aims: first, to investigate the QoL of caregivers of family members with SMI and, second, to evaluate the impact of social support on caregivers' QoL (Leng et al., 2019).

Care Givers of patients with Schizophrenia

The value of caregivers of patients with schizophrenia to have adequate knowledge of the illness and the therapies and supports for patients has been emphasised in recent studies (Cuncic,2023). For the caregiver, information on age, gender, hometown, marital status, education level, employment status, monthly income, relationship to patient, living with patients or not, health status, knowledge about the mental illness and SMI policy, and the total length of time and average number of hours per day spent caring for the patient. The demographic survey also asked the caregiver to provide information on the family member under their care, including age, gender, marital, education, and employment status, financial burden, illness state, medication and treatment compliance, and numbers of caregivers to care for each patient. Caregiver needs and concerns Caregivers were also asked to report the most concerning factors (such as patient's illness rehabilitation, illness severity and family financial burden) and most urgent needs related to care giving, including their body health, material life, family situation, dream job and entertainment (Leng et al., 2019). The most concerning factor for caregivers was whether their family member could recover (63.0%), with 16.6% worried about the disease severity and 12.7% worried about the economic burden. Eighty-four percent (84.5%) of participants reported that their most urgent need was their health, while only 6.1% choose material life, 3.9% marriage burden as well as objective support received were significantly correlated to caregivers' physical health QoL domain. Patient's marital status and illness state, family monthly income, caregivers' coordination of caring, life and work, knowledge about SMI, subjective support received as well as utility of support were significantly correlated to caregivers' QoL in the domain of mental health. Given China's unique cultural context and the reliance on family care giving, caregivers' QoL is an important practical and public policy concern. Our findings showed that caregivers' QoL is a multidimensional phenomenon, where caregivers' physical health, mental health, financial situation and social life interact (Rungreangkulkij& Gilliss, 2000). This investigation of caregivers' QoL and the correlation between social support and caregivers' QoL highlights the multidimensional nature of caregiver health. Findings also indicate that caregivers had low QoL in several domains including role-physical, role-emotional and mental health. Further, caregivers rated themselves as having minimal levels of past support and little support seeking behavior. Our findings also suggest that the caregivers receiving good support from their colleagues, friends, neighbors and relatives had a better QoL. We found that different aspects of social support were correlated to the QoL differently in the mental and physical domains. Compared with the QoL of the general population in Shandong province (Jing, Liu, Ding, Xiangyun, & Han, 2008) and China (Panet al., 2011), family caregivers in our study perceived themselves with a poorer QoL, with both the mental summary and psychical summary scores lower than those for the general population. Using the same scales, caregivers in our study reported a lower QoL in the domains of role-physical (61.3 < 77.5), bodily pain (74.9 < 82.2) and role emotional (57.6 < 67.9) than the general population in China (Pan et al., 2011). Since caregivers spend much of their time caring for a SMI family member, they lack time for

personal entertainment and social engagement. Also, the QoL of carers in our sample was lower than that reported in Western studies, but higher than in Hong Kong (Chien et al., 2007). Levels of social support in the current sample were similar to those reported by Zeng et al. (2016) in their study of Guangzhou-based caregivers(Leng et al., 2019).

Schizophrenia is a chronic, severe mental illness characterizedby psychosis, hallucinations, delusions, and disorganizedspeech and behaviour. Itis characterized by distortions in thinking, perception, emotions, language, sense of self and behavior. Common experiences include hallucinations and delusions(McGrath et al., 2008).The clinical course of schizophrenia is typicallyone of highly recurrent acute episodes with chronic impairmentof social, vocational and personal wellbeing. (Hiwot et al., 2018)(Saha et al., 2005)

Generally, mental disorders have a high prevalence compared with many otherhealth conditions. Even schizophrenia and bipolar disorder, with the lowest prevalence among mental disorders (<1%), have a higher prevalence than many otherdiseases and health conditions. These relatively less common disorders have high associated impairment with its consequence severe presentation(Eaton et al., 2008). It has been estimated that approximately seven individuals per one thousand will develop Schizophrenia during their lifetime, with onset of symptoms usually during the second or third decade(Lora et al., 2012). The prevalence of schizophrenia in the general population is 0.5to 1%, with a higher risk and poorer outcome among malesthan females(Luo et al., 2020).The incidence of schizophrenia was higher in urban settings compared with mixed urban/rural settings; however, like in the sex differential, this gradient was not reflected in the distribution of prevalence estimates(Goldacre et al., 1994)(McGrath et al., 2008).One of the greatest problems clinicians face when dealingwith chronic illnesses is the effectiveness of treatment.Thisis determined by various different factors such as patient toleranceof the drug, the appropriateness of the regimen, and, above all, adherence to the treatment prescribed. The best medication atthe optimum dose can never be effective if the patient does not take it(García et al., 2016)(Shehu et al., 2019).

Family-based interventions require that the patient's immediate family join the intervention group not only to improvethe outcomes of treatment and prevent recurrence, but also to improve the mental health of family membersand help them understand the disorder. This type of interventionaims to increase the capacity of both patientsand their families to resolve issues and manage the illness.(Li & Arthur, 2005)Family interventions often focus on teaching psycho-educational programs, as well as improving coping strategies.On the other hand, sometimes people with schizophrenia do not receive support from their families. Withouttreatment, their symptoms may become more severe, andtheir strange behavior may isolate them from their family(Li & Arthur, 2005). Family love and support play an important role in the treatment of schizophrenia. Helping a schizophrenic family member without benefiting from socialservices could be difficult; therefore, family caregivers need to use these kinds of services. They also need to takecare of themselves against the difficulties of care giving(Rita Petretto, 2017).

The person taking care of a schizophrenic family member may deal with difficult emotions, including fear, guilt,anger, frustration, and disappointment(Bäumlet al., 2006). It may be hard for a caregiver to accept the disorder; they may worry aboutschizophrenia label, and try to hide the disorder from others or may become confused by the strange behaviors that they do not understand (Luckstedet al., 2012). Although,the content of psycho-educational intervention varies between different studies, there are common factors amongthese studies(Luckstedet al., 2012).

Family caregivers of persons with bipolar disorder and schizophrenia experience high level of burden and compromised quality of life (Wilkinson et al., 2000). A considerable amount of burden on the caregivers often leads to display of certain attitudes towards persons with severe mental illness called expressed emotion, which then leads to poor quality of patients as well. Although numerous studies dealing with these issues separately are present, but studies dealing with relationship, using mixed methodology, among these issues are scarce (Margetićet al., 2013).

METHODS AND MATERIALS

Research design: a quasi-experimental study was conducted

Research setting: Some selected Hospitals in Jigawa state

Study Population and sampling technique: two hundred and fifty-three participants were recruited based on the calculated representative sample size. The study participants shared similar socio-demographic characteristics such as age, educational attainment, affiliations, and Settings One hundred and twenty-seven (127) participants were assigned to the experimental group while 126 participants were in the control group.

Tool: The main tool used was questionnaire prepared by the researcher based on WHO-QoLBref rating scale. The questionnaire contains six sections:

Procedure for data collection:

Pre-intervention Baseline data: This was collected from the potential respondents (caregivers) in both experimental and control groups using the study questionnaire. Questionnaire was administered by a member of the research team the selected participants in the experimental group received training on psycho-education for ten days by the researcher and support staff/research assistants. The training guidelines and materials were developed by the researcher after extensive literature search and review on the predictors of good knowledge of medication Adherence among care- givers of patients with Schizophrenia (Shehu et al., 2023).

Intervention: After the baseline data collection in both the experimental and control groups,

Ethical considerations: The provisions of the HELSINKI declaration were respected (Shehu, et al., 2019). All privacy and confidentiality was also guaranteed during and after the data collection.

RESULTS:

Socio-demographic characteristics of the care givers of Patients

Table 1: Socio-demographic characteristics of the care givers of patients in both the experimental and control group

Variables	Experimental(N=127)		Control(N=126)	
	Frequency	Percent (%)	Frequency	Percent (%)
Age range				
25 – 34	12	9.4	11	8.7
35 – 44	42	33.1	44	34.9
45 – 54	33	26.0	30	23.8
55 – 64	25	19.7	22	17.5
65 – 74	15	11.8	19	15.1
Mean ± SD	48.6 ± 11.7		49.0 ± 12.1	
Educational status				
Non formal education	35	27.6	42	33.3
Primary	34	26.8	25	19.8
Secondary	47	37.0	43	34.1
Tertiary	11	8.7	16	12.7
Sex				
Male	65	51.2	75	59.5
Female	62	48.8	51	40.5
Ethnic group				
Hausa	110	86.6	111	88.1
Others	17	13.4	15	11.9
Religion				

Islam	112	83.0	114	90.5
Christianity	25	17.0	12	9.5
Occupation				
Farmers	30	23.6	33	26.2
Civil servants	15	11.8	17	13.5
Housewives	62	48.8	51	40.5
Student	10	7.9	13	10.3
Business	10	7.9	12	9.5
Marital status				
Married	101	79.5	103	81.7
Others	26	20.5	23	18.3
Monthly income				
>N50,000.00	64	50.4	63	50.0
≤N50,0000.00	63	49.6	63	50.0

Table 1 shows the socio-demographic characteristics of care-givers of the patients with schizophrenia in the experimental and control groups in Jigawa State, Nigeria. From the result, 127 participants in the experimental group had mean age of 48.6 ± 11.7 years while the 126 participants in the control group had mean age of49.0 ± 12.1. The age group of 35 – 54 years constituted about 60% of the participants in both groups (59.1% and control 58.7% respectively). About three-quarters of the participants in the experimental group and two-thirds in the control group have educational status of primary school certificate and above. More than half of the study participants in both groups were males. In terms of ethnicity and tribe, Hausa and Muslims constitute majority of the study population with majority of them as housewives. About half of the study participants in both the experimental and control group have monthly income of more than fifty thousand Naira

Table 2: Assessment of the baseline level of knowledge on medication adherence among care-givers of Schizophrenic patients in both the experimental (intervention) and control group

Knowledge on medication adherence	Experimental		Control	
	Frequency	**Percentage (%)**	**Frequency**	**Percentage (%)**
Good	65	51.2	63	50.0
Poor	62	48.8	63	50.0
Total	**127**	**100.0**	**126**	**100.0**

Table 3: Factors affecting quality of life among in both the experimental and control group

Variables	Experimental (N=127)		Control (N=126)	
	Yes	No	Yes	No
Illness				
Did you access medical care during the early onset your illness?	70 (55.1)	57 (44.9)	68 (54.0)	58 (46.0)
Life style				
Do you smoke	26 (20.5)	101 (79.5)	30 (23.8)	96 (76.2)
Do you engaged in alcoholism	18 (14.2)	109 (85.8)	15 (11.9)	111 (88.1)
Do you engaged on other substance abuse	43 (33.9)	84 (66.1)	40 (31.7)	86 (68.3)
Medication				

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Did you think the medication you are taking has any negative impact on your illness	69 (54.3)	58 (45.7)	65 (51.6)	61 (48.4)
Did it affect your activities (psycho-motor retardation)?	60 (87.0)	9 (13.0)	60 (92.3)	5 (7.7)
Social				
Did it affect your speech (poverty of speech)?	32 (46.4)	37 (53.6)	33 (50.8)	32 (49.2)
Did that predispose you to anxiety?	31 (44.9)	38 (55.1)	32 (49.2)	33 (50.8)

Most of the participants in both the experimental and control group have different degrees on factors affecting quality of life as indicated in the table above.

Table 4: Comparison of baseline and post-intervention knowledge on medication adherence among care-givers of experimental group

Variables	Baseline		Post-intervention		X^2	P-value
	Yes	No	Yes	No		
Schizophrenia is a chronic disease	43 (33.9)	84 (66.1)	90 (73.4)	32 (26.6)	38.2472	<0.05[*]
It is commoner among females	41 (32.3)	86 (67.7)	91 (74.6)	31 (25.4)	43.0294	<0.05[*]
Knowledge of symptoms of schizophrenia	42 (33.1)	85 (66.9)	90 (73.4)	32 (26.6)	39.7616	<0.05[*]
Coping with some of the patients symptoms	55 (43.3)	72 (52.8)	90 (73.4)	32 (26.6)	22.5061	<0.05[*]
Drug treatment can reduce its severity	40 (31.5)	87 (68.5)	91 (74.6)	31 (25.4)	44.6372	<0.05[*]

There is need of continues follow up	43 (33.9)	84 (66.1)	90 (73.4)	32 (26.6)	38.2472	<0.05*
Appropriate time to take medication	42 (33.1)	85 (66.9)	91 (74.6)	31 (25.4)	41.4551	<0.05*
Knowledge of side effects of drugs (positive and negative)	45 (35.4)	82 (64.6)	90 (73.4)	32 (26.6)	35.3160	<0.05*
Knowledge of sign of relapse	43 (33.9)	84 (66.1)	91 (74.6)	31 (25.4)	39.9138	<0.05*

*Statistically significant difference

There was increase in all the variables of knowledge on medication adherence between baseline and post intervention level in the experimental group. These differences were found to be statistically significant (p=<0.05) as indicated in the Table 4.

Table 5: summary of baseline and post-intervention aggregate scores on knowledge on medication adherence among care-givers of the experimental group.

Variables			Post-intervention		X^2	P-value
	Baseline n=127		n=122			
	Frequency	Percentage (%)	F	(%)		
Good	65	51.2	92	75.4	14.6569	<0.05*
Poor	62	48.8	30	24.6		

*Statistically significant difference

About half of the study participants at baseline (51.2%) and three quarter at post-intervention (75.4%) have good level of knowledge on medication adherence scores. However, there was statistically significant difference between the baseline and post-intervention scores on the level of knowledge on medication adherence scores (p=<0.05) as indicated in the table above

Table 6: Relationship between socio-demographic characteristics and level of knowledge among care-givers in the experimental group

Variables	X^2	P-value
Age range	1.007	0.7996
Educational status	2.2313	0.5258
Gender	0.9626	0.3265
Ethnic group	10.0117	<0.05[*]
Monthly income	4.0266	<0.05[*]
Occupation	8.3403	0.0799
Marital status	0.0607	0.8053

*Statistically significant difference

There was an association between care-givers knowledge on schizophrenia and medication adherence with ethnic group, religion and monthly income. However, this relationship was found to be statistically significant (p=<0.05). Care-givers with monthly income of more than fifty thousand Naira were more likely to have good knowledge on schizophrenia and medication adherence. There was no statistically significant association between age, educational status, marital status and sex with knowledge of schizophrenia and medication adherence of care-givers of study participants in the experimental group (p=>0.05).

Table 7: Multivariate (Logistic Regression) analysis of predictors of good knowledge on medication adherence among care-givers of schizophrenic patients in the experimental group

Predictors	Crude OR (95% CI)	Adjusted OR (95% CI)	p-value
Ethnic group	2.7 (0.87-13.12)	3.1 (0.75-22.14)	>0.05
Religion	2.11 (0.98-11.18)	2.55 (0.83-18.75)	>0.05
Member of family with similar condition	1.88 (0.75 – 11.56)	2.01 (1.75 – 8.24)	<0.05*
Cost of treatment	1.86 (1.51 – 8.76)	2.50 (2.11 – 8.83)	<0.05*
ECT treatment	0.44 (0.33 – 2.85)	0.50 (0.27 – 0.85)	<0.05*
Combination of drugs and ECT	2.29 (0.81 – 6.61)	3.01 (1.85 – 14.76	<0.05*
Have Side effects	3.76(2.99 – 18.79)	4.00 (2.05– 21.55)	<0.05*
Monthly income	2.75 (0.96-13.66)	3.00 (1.01-15.88)	<0.05*

*Statistically significant difference

After adjusting for the confounding effects using logistic regression analysis; type of treatment (ECT) was found to be negative predictors of good knowledge on medication adherence to treatment among study participants (AOR=0.50, 95%CI=0.27 – 0.85). While, cost of treatment of more than one thousand five hundred naira per day (AOR=2.5, 95%CI=2.11 – 8.33), combination of drugs and ECT (AOR=3.01, 95%CI=1.85 – 14.76), presence of side effects (AOR=4.00, 95%CI=2.05-21.55) and monthly income (AOR=3.00, 95%CI=1.01-15.88)were positive predictors of good knowledge on medication adherence among the study participants in the experimental group

Table 8: Multivariate (Logistic Regression) analysis of predictors of good medication adherence scores among schizophrenic patients in the experimental group

Predictors	Crude OR (95% CI)	Adjusted OR (95% CI)	p-value
Ethnic group	2.7 (0.87-13.12)	3.1 (0.75-22.14)	>0.05
Working as Civil servants	1.84 (0.56-9.13)	2.00 (1.11-14.33)	<0.05*
Housewives	2.65 (1.54-17.88)	4.03 (2.14 – 12.33)	<0.05*
Student	0.66 (0.45-6.89)	0.54 (0.44-8.33)	>0.05
Business	1.77 (0.98-8.93)	2.01 (1.55-12.56)	<0.05*
family history	1.97 (0.18-9.99)	2.10 (1.77 – 12.25)	<0.05*
Cost of treatment	1.86 (1.51 – 8.76)	3.00 (2.83 – 12.24)	<0.05*
ECT treatment	0.44 (0.33 – 2.85)	0.25 (0.18– 0.75)	<0.05*
Combination of drugs and ECT	3.37 (0.75 – 9.55)	4.03 (2.75 – 17.53)	<0.05*
Side effects	3.55(2.55 – 15.26)	3.00 (2.45– 15.76)	<0.05*

*Statistically significant difference

After adjusting for the confounding effects using logistic regression analysis; type of treatment (ECT) (AOR=0.25, 95%CI= 0.18 – 0.75) was found to be negative predictor of medication adherence to treatment among study participants (AOR=0.25, 95%CI= 0.18 – 0.75). While, cost of treatment of more than one thousand five hundred naira per day (AOR=3.00, 95%CI=2.83 – 12.24), occupational status of civil servants (AOR=2.00, 95%CI=1.11–14.33); housewives (AOR=4.03, 95%CI=2.14 – 12.33) and business (AOR=2.01, 95%CI=1.55 – 12.56), combination of drugs and ECT (AOR=4.03, 95%CI=2.75 – 17.53), presence of side effects (AOR=3.00, 95%CI=2.75-15.76) were positive predictors of good medication adherence among the study participants in the experimental group.

Table 9: Multivariate (Logistic Regression) analysis of predictors of good quality of life scores among schizophrenic patients in the experimental group

Predictors	Crude OR (95% CI)	Adjusted OR (95% CI)	p-value
Ethnic group	1.18 (0.93-15.31)	2.01 (0.88-16.23)	>0.05
Religion	2.11 (0.98-11.18)	2.55 (0.83-18.75)	>0.05
Health Care provider Psychiatrist	3.75	4.11 (2.33- 16.76)	<0.05*
Health Care provider Psychiatric nurse	2.01	2.25 (1.99- 18.46)	<0.05*
Member of family with similar condition	2.00 (0.66- 12.45)	3.02 (1.42- 15.34)	<0.05*
Cost of treatment	3.06 (1.51 – 8.76)	4.03 (3.56– 12.45)	<0.05*
ECT treatment	0.33 (0.25 – 3.75)	0.50 (0.27 – 2.71)	>0.05
Combination of drugs and ECT	2.51 (0.81 – 6.61)	2.77 (0.76 – 8.23)	>0.05
Side effects	0.66 (0.56 – 3.45)	1.67 (1.33– 11.57)	<0.05*

*Statistically significant difference

After adjusting for the confounding effects using logistic regression analysis; cost of treatment of more than one thousand five hundred naira per day (AOR=4.03, 95%CI=3.56 – 12.45), contact with health care providers i.e Psychiatrist (AOR=4.11, 95%CI=2.33-16.76) and Psychiatrist Nurse (AOR=2.55, 95%CI=1.99-18.46) and presence of side effects (AOR=1.67, 95%CI=1.33-11.57) were positive predictors of good quality of life among the study participants in the experimental group.

DISCUSSION

This study analyzed the predictors of knowledge of medication adherence among care-givers of patients with Schizophrenia in some selected Hospital of Jigawa State, Nigeria. The study revealed that caregivers of patients with schizophrenia had improved knowledge after exposure to the education intervention. The study reports statistically significant relationships between care-givers' knowledge of schizophrenia and medication adherence with ethnic and religious affiliations, and monthly income (p=<0.05). Care-givers with monthly income of more than fifty thousand Naira were more likely to have good knowledge on schizophrenia and medication adherence. There were however no statistically significant associations between age, educational status, marital status and sex with knowledge of schizophrenia and medication adherence of care-givers of study participants in the experimental group (p=>0.05). These

findings are consistent with the reports ofLeng et al., (2019) who reported family, material, and interaction patterns as predictors of care-givers' information on schizophrenia and its treatment. Interestingly, improvement in caregivers' knowledge of schizophrenia and medication adherence are cardinal areas of caregiving to such patients (Cuncic, 2023).

Adjusting for the confounding effects using logistic regression analysis, ECT as a type of treatment was found to be a negative predictor of good knowledge on medication adherence to treatment among study participants. While, cost of treatment of more than one thousand five hundred naira per day (about US$5), combination of drugs and ECT, presence of side effects and monthly income were positive predictors of good knowledge on medication adherence among the care-givers of study participants in the experimental group.

Multivariate (Logistic) regression analysis also showed that, type of treatment (ECT) was found to be negative predictor of medication adherence to treatment among study participants: those study participants who were on ECT alone, combination of ECT and drugs were two times and three times less likely to be non-adherent respectively compared to those who were on drugs treatment only. This might be due to the fact that there were more care as regards to patients on ECT and combination of drugs then ECT alone because of close monitoring by the family members that take the patients to hospital. While, cost of treatment of more than one thousand five hundred naira per day, occupational status of civil servants; housewives and business; presence of side effects were positive predictors of good medication adherence among the study participants in the experimental group. Study participants who reported any form of side effect were four times more likely to be non-adherent than those without side effects. Of those who were non-adherent, over 60% reported side effect. This is because the presence of side effects is associated with significant impairment in the quality of life of the subjects as well as it served as a hindrance to them in carrying out some of their activities of daily living. Secondly, based on this study interaction with some of the patients in our study areas, those who experienced incapacitating side effects, view it as punitive and therefore decline psychiatric medications. This negative view of the side effect profile contributes significantly to non-adherence to anti-psychotic medications among some African patients. A study by DiBonaventura et al. (2012), on the impact of side effects on medication adherence among psychiatric patients revealed a similar outcome. On predictors of quality of life among the study participants, the following were documented:there was an association between quality of life and socio-demographic factors with ethnic group and occupational status; housewives were more likely to have good quality of life. However, this relationship was found to be statistically significant (P<0.05). There was no statistically significant association between age, educational status, religion, marital status and sex with quality of life among study participants in the experimental group (P>0.05). However, in a study involving interviews with schizophrenic patients visiting a community-based consultation service, Baker and Intagliata reported no significant relationship between QOL and patient's age or sex, which is also the same findings with this study. As evidenced from the above, results of research vary to the point that it is difficult to identify a general trend.Contact with health care provider and

family member with similar condition was associated with good quality of life; those who had contact with Psychiatrist and family members with similar illness were more likely to have good quality of life. However, the relationship was found to be statistically significant (P<0.05).

CONCLUSION

Patients with schizophrenia often require access to social support systems provided by family members, friends, and commu¬nity agencies that provide case manage¬ment and attendant care services. Patients who are adherent to medication tend to have greater perceived family involvement in medication treatment, and tend to have been raised in a family that had more of a positive attitude toward medication resulted in patients having greater difficulty gaining access to case management and at¬tendant care services, which then leads to increased rates of medication nonadherence.

Recommendations

Based on the findings of the study, the following were recommended:

i.   Psycho-education should be included as part of management plan to all newly diagnosed schizophrenic patients and at least one of their care giver;

ii.   Psycho-education should be conducted at least once for every two to three years for chronic schizophrenic patients and their caregivers: this will serve as re-enforcement to recommendation no

iii.   Ways to improve patients' income has a significant impact on their Mental Health

Original contribution of knowledge

I. There are a relationship (AOR=2.55, 95%CI=1.99-18.46),(AOR=4.03, 95%CI=3.56 – 12.45), and (AOR=1.67, 95%CI=1.33-11.57) between cost of treatment, contact with health care providers, and presence of side effects respectively as a positive predictors of good quality of life among the study participants in the experimental group.

II. There are a relationship (AOR=2.00, 95%CI=1.11–14.33),(AOR=4.03, 95%CI=2.14 – 12.33) ,(AOR=2.01, 95%CI=1.55–12.56),(AOR=4.03, 95%CI=2.75–17.53), and(AOR=3.00, 95%CI=2.75-15.76) between cost of treatment, occupational status of civil servants ,housewives, business, combination of drugs and ECT , and presence of side effects respectively as a positive predictors of good medication adherence among the study participants in the experimental group.

III. There are a relationship (AOR=0.50, 95%CI=0.27 – 0.85) between type of treatment (ECT) as a negative predictors of good knowledge on medication adherence to treatment among study participants

IV. There are a relationship (AOR=2.5, 95%CI=2.11 – 8.33), ECT (AOR=3.01, 95%CI=1.85 – 14.76) , (AOR=4.00, 95%CI=2.05-21.55) and (AOR=3.00, 95%CI=1.01-15.88) between , cost of treatment of more than one thousand five hundred naira per day, combination of drugs and presence of side effects and monthly income as positive predictors of good knowledge on medication adherence among the study participants in the experimental group

Limitations

1.   Study participant might decide to withdraw from the study at any time in the course of this research;

2.   Time, financial and logistic constraints

Compliance with ethical standards

Acknowledgments

Disclosure of conflict of interest

As the Author; no any area of conflict of interest in the manuscript

Statement of Ethical approval

Ethical clearance was obtained from the ethical committee of Jigawa State Ministry of Health, before commencement of the study. The provisions of the HELSINKI declaration will be respected.

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