AFRICAN JOURNAL OF MEDICINE and medical sciences

VOLUME 34 NUMBER 1 MARCH 2005

ISSN 1116—4077

Afr J. Med med. Sci. (2005) 34, 15-23

Financial cost of treating Nigerian in-patients with schizophrenia

G Amoo and AO Ogunlesi
Aro Neuropsychiatric Hospital, P.M.B 2003, Abeokuta, Nigeria

Summary
Fifty seven each of hospitalised schizophrenic patients (fulfilled diagnostic criteria for research version of I.C.D. 10) and diabetic patients respectively, matched for age and sex, were followed up from admission to discharge (July 1997 - December 1997). B.P.R.S. was used to measure the severity of psychopathology at admission and discharge for the former, while the levels of blood glucose at admission and discharge were assessed for the latter. Also, interviewed during the study were 374 relatives comprising 102 and 272 relatives of schizophrenic and diabetic patients respectively. Weekly assessments of cost of treatment were done from admission to discharge using the proforma which took cognisance of aspects of direct and indirect costs for patients and relatives of both groups. Schizophrenic patients had a poorer employment record (P = 0.000), more diabetic patients were married (P = 0.000), relatives shouldered the financial burden of care of more schizophrenic patients (P = 0.000), more schizophrenic patients travelled over an average of 122 km to reach the hospital whereas diabetic patients travelled averagely 19.8 km (P = 0.000) and the mean duration of admission for schizophrenic patients was significantly longer (P=0.000). The mean monthly income for diabetic patients was significantly higher than for schizophrenic patients (P = 0.000), and the mean direct cost for schizophrenia per admission ₦9,882.00 was significantly higher than that of diabetes mellitus ₦7,892.00 (P = 0.000). The mean indirect cost for schizophrenic patients per admission which is ₦3,604.00 did not differ significantly from that of diabetic patients of ₦1,488.00 (P = 0.288). The mean total cost of schizophrenia per admission - is ₦11,337.00 and was significantly higher than for diabetes ₦8,571.00 (P = 0.000). However, the mean direct cost per week for diabetes mellitus ₦4,494.00 was significantly higher than for schizophrenia ₦1,011.00 (P=0.00 The mean indirect cost for diabetes mellitus per week ₦406.00 did not differ significantly from that of schizophrenia ₦168.00 (P = 0.602). The mean total cost of diabetes mellitus per week ₦4,910.00 was significantly higher than for schizophrenia ₦1,235.00 (P = 0.000). Cost of medication ranked highest in all items of cost for both the schizophrenic and diabetic cohorts. The implications of the findings on clinical practice in Nigeria and our current socio- economic scenario (especially with regard to schizophrenic patients and their families) are discussed. The need to reinforce the socio-economic support from government and the larger society for schizophrenic patients and their families is highlighted.

Keywords: *Schizophermia, cost of trearment, diabetes patients*

Correspondence: Dr. A.O. Ogunlesi, Aro Neuropsychiatric Hospital, P.M.B. 2002, Abeokuta, Nigeria.

Résumé
Chaque cinquante sept de malades schizophrènes hospitalisés (un critère diagnostique a accomplir pour une version de la recherche de l' I.C.D. 10) et de malades diabétiques respectivement du meme âge et sexe, ont été suivi des le temps d'admission jusqu'au renvoi (Juillet 1997 - Décembre 1997). Pendant la période, le B.P.R.S était utilisé pour mésurer la sévérité de psychopathologie de schizophrènique et les niveaux de glucose du sang pour le diabétique. Pendant cet étude, les relations de ces maladies (374, 102 de schizophrènique et 272 de malades diabétiques respectivement ont été interrogés. Les estimations hébdomadaires de coût de traitement étaient fait, utilisant le proforma qui considere les coûts directs et indirects pour les malades les relation des deux groupes. Les malades schizophrènes avaient un dossier de l'emploi plus pauvre (P = 0.000), plusieurs des malades diabétiques se sont mariés (P = 0.000), les parents sont plus financiellement responsible pour les malades schizophrènes (P = 0.000), plusieurs d'eux voyageaient a l'hopital sur une moyenne de 122km pendant que les malades diabétiques couvrent une moyenne de 19.8 kms (P = 0.000) et la durée moyenne d'admission pour les malades schizophrènes était considérablement plus longue (P = 0.000). Le revenu mensuel moyen pour les malades diabétiques était considérablement plus haut que pour les malades schizophrènes (P = 0.000), et le coût direct moyen pour le schizophrénie par admission N9,882.00 était considérablement plus haut que cela de diabète mellitus N7,892.00 (P = 0.000). Le coût indirect moyen pour les malades schizophrènes par admission N3,604.00 n'a pas été considérablement différent de cela des malades N1,488.00 diabétiques (P = 0.288). Le coût total moyen de schizophrénie par admission N11,337.00 était considérablement plus haut que pour le diabète N8,571.00 (P = 0.000). Cependant, le coût direct moyen par semaine pour le diabète mellitus N4,494.00 était considérablement plus haut que pour le schizophrénie N1,011.00 (P = 0.000). Le coût indirect moyen pour le diabète mellitus par semaine N406 n'a pas été totalement différent de cela de schizophrénie N168.00 (P = 0.602). Le coût total moyen du diabète mellitus par semaine N4,910.00 était considérablement plus haut que pour le schizophrénie N1,235.00 (P = 0.000). Le coût de médicament est classifié plus haut dans tous les articles de coût pour les schizophrènes et les diabétiques. Les implications de cette decourvetes au Nigeria sur la vie socio-economique (surtout quant aux malades schizophrènes et leurs familles) est discuté. Le besoin de renforcer le support socio-économique de gouvernement et la plus grande société pour les malades schizophrènes et leurs familles sont mises en valeur. .

Introduction

Schizophrenia is the heartland of psychiatry and the core of its clinical practice. It is also the most costly illness that psychiatrists treat [1], the most common cause of psychiatric hospitalization [2], as well as a great burden on the health services [3].

The assessment of the financial burden of an illness could be done by measuring indices such as direct, indirect and intangible costs of treatment respectively. Direct costs relate to the actual monetary expenditure incurred in treating an illness, while indirect costs involve the financial implications of lost output or productivity due to the illness. Intangible cost would represent the cost implications of reduced quality of life of patients and relatives, stress, etc [4,5].

Some studies in the developed countries have attempted to estimate the financial costs of treating schizophrenia [6,7]. Davies and Drummond [6], using a prevalence-based approach to disease costing reported that the average direct cost of schizophrenia per person per year in the U.K. was approximately £1,670.00. They calculated the total annual cost of treatment and care by multiplying the average cost per person by the average treatment prevalence of schizophrenia, giving an approximate figure of £310 million (1987 prices). Of the latter, hospital and residential care costs represented the major items of expenditure (74%), non residential care costs (excluding drug therapy) amounted to 23% of total direct costs, while the cost of drugs was only 3%. Based on some assumptions, they also gave the annual indirect cost of schizophrenia to be in the region of £1.7 billion. Andrews *et al* [7] employed the incidence-based approach to disease costing. This involves calculating the lifetime costs of a cohort of people with schizophrenia from the onset of the disease to death. They compared the direct and indirect costs of schizophrenia, using this approach, with similar costing of myocardial infarction in Australia and U.S.A. and concluded that the cost associated with a single case of schizophrenia was six times that of myocardial infarction.

In Nigeria, some studies have attempted to examine the burden of schizophrenia in general terms [8,9,10] without specifically assessing in monetary terms, the financial cost of treatment. The only attempt to address this lacuna in the local literature was the study by Suleiman *et al* [11]. In this controlled study, the authors assessed the financial implication of treating 50 schizophrenic out-patients and 40 Insulin dependent, out-patient diabetic controls in Lagos over a six-month period. They reported that 40% of schizophrenics and 20% of diabetics had no income at all. The mean total cost for Schizophrenia (₦2,951.4 or US$35.9) was significantly smaller than that of diabetes (₦11,791 or US$143) ($t = 9.2$; $d.f = 88$; $p = 0.001$). The cost of antipsychotic drugs accounted for 52.8% of the total cost of schizophrenia, while Insulin injection accounted for 92.8% of the total cost of diabetes. Furthermore, they observed that patients with Schizophrenia and their relatives suffered significantly more loss of working days than diabetic controls and relatives. The present study is an attempt to complement the findings in the latter [11] by providing additional information on the financial cost of treating a group of Nigerian in-patients with schizophrenia compared with diabetic controls over a six-month period.

Methods

The study was carried out at the Aro Neuropsychiatric Hospital and the Federal Medical Centre, both located in Abeokuta, over a six-month period (June - December, 1997). The former is a modern psychiatric hospital with a nationwide catchment area, while the latter is a modern secondary care facility.

The study group drawn from the wards of Aro Neuropsychiatric Hospital comprised 57 patients (relapsed and newly admitted) who fulfilled the diagnostic criteria for research version of I.C.D.10 for schizophrenia. Those with concurrent diagnosis of substance abuse, Organic Brain syndrome or who were suffering from physical illnesses were excluded from the study. The controls, matched for age and sex consisted of 57 (Insulin dependent and non Insulin dependent) diabetic patients drawn from the medical ward of the Federal Medical Centre, Abeokuta and the diagnoses were made by the consultant physician.

Instruments

A questionnaire for patients, a self reported questionnaire for relatives and the Brief Psychiatric Rating Scale (BPRS - Kolakowska version) were employed for the assessments. The patients' questionnaire assessed socio- demographic/ clinical data of the patients as well as the items of direct and indirect costs of treatment. Items of direct cost, assessed at weekly intervals included cost of transportation, cost of laboratory investigations, and cost of physical treatments (drugs/E.C.T.), costs of feeding/bedding and registration fees. Receipts obtained were used to confirm costs and where receipts were not available, liaison was made with the appropriate departments. For logistic reasons, the costs of multidisciplinary personnel input were excluded in both centres and the main indirect cost item assessed in this study was the lost earnings by patients and care givers.

The self reported questionnaires for relatives, which were completed on admission and at each visit respectively, assessed socio demographic data of relatives as well as items of direct and indirect costs of treatment. Direct costs included transportation, pocket money given to patients or nurses on behalf of the patient, hotel accommodation and feeding of visiting relatives if applicable, costs of food items and non food items brought for the patient. The B.P.R.S. was administered to the patients on admission and after discharge from the ward.

Table 1: Sociodemographic characteristics of schizophrenic and diabetic subjects

Characterisitics	Schizophrenic patients n = 57	Diabetic Patients n = 57	Test of significance	*P* Value
Age mean (SD) years	44.5 (11.9)	45.7 (11.8)	U = 0.369	$p = 0543$
Sex: Male	27 (47.4%)	27 (47.4%)	$X^2 = 0.04$	$p = 0.851$
Female	30 (52.6%)	30 (52.6%)		
Education				
No formal education	10 (17.5%)	10 (17.5%)	$X^2 = 0.23$	$p > 0.99$
Primary school	18 (31.6%)	17 (29.8%)		
Secondary school	20 (35.1%)	20 (35.1%)		
Post secondary school	7 (12.3%)	7 (12.3%)		
University	2 (3.5%)	3 (5.3%)		
Employment				
Employed	17 (29.8%)	46 (80.7%)	$X^2 = 30.02$	$p = 0.000$
Unemployed	38 (66.6%)	10 (17.5%)		
Retired	2 (3.3%)	1 (1.8%)		
Nature of employment				
Civil service	5 (29.8%)	11 (23.9%)	$X^2 = 0.01$	$p = 0.905$
Private	12 (70.6%)	35 (76.1%)		
Occupational status				
Highly skilled Prof. I	1 (1.8%)	4 (7.0%)	$X^2 = 5.39$	$p = 0.145$
Highly skilled Prof II	4 (7.0%)	6 (10.5%)		
Semi skilled	22 (38.6%)	28 (49.1%)		
Unskilled	30 (52.6%)	19 (33.3%)		
Marital status				
Single never married	15 (26.3%)	3 (5.3%)	$X^2 = 29.2$	$p = 0.000$
Married	23 (40.4%)	48 (84.2%)		
Divorced	1 (1.8%)	1 (1.8%)		
Separated	15 (26.3%)	1 (1.8%)		
Widowed	3 (5.3%)			
Religion				
Traditional	1 (1.8%)	0 (0.0%)	$X^2 = 2.09$	$p = 0.351$
Christianity	32 (40.4%)	27 (47.4%)		
Islam	24 (42.1%)	30 (52.6%)		
Payment for treatment				
Relative	56 (98.2%)	25 (43.9%)	$X^2 = 40.9$	$p = 0.000$
Employer	0 (0.0%)	2 (3.5%)		
Patient himself/herself	1 (1.8%)	30 (52.6%)		
Distance from the hospital(km)				
(Km. Mean (SD)	122.2 (189.0)	19.8 (22.7)	U = 57.14	$p = 0.000$
Monthly Income (N)				
Mean (SD)	1227 (2207)	3128 (2010)	U = 26.8	$p = 0.000$

U = Mann-Whitney Test
X^2 Chi square Test

Procedure

The draft questionnaires were reviewed by four consultant psychiatrists and an economist and thereafter translated into Yoruba and back translated. A pilot study involving 10 schizophrenic patients and 10 diabetic patients excluded from the study resulted in some modifications to the initial versions of the questionnaires. Informed consent was sought from patients and relative preparatory to the commencement of the assessments. In cases where the patient was grossly psychotic and consent could not be obtained, the relation's consent was relied upon. Key relatives who accompanied the patients to hospital were initially assessed. The lead author who is fluent in both English and Yoruba conducted the assessments. Aspects of direct and indirect cost were subsequently assessed at weekly intervals. In the case of relatives who visited while the lead author was unavailable, a senior nurse on duty read out the questionnaires to the illiterate relatives in the local language. The built-in check mechanisms in the study ensured that all visiting relatives completed the questionnaires. The patients were followed up for six months.

Table 2: Sociodemographic characteristics of key relatives of schizophrenic and diabetic patients

Characteristics	Relatives of schizophrenic patients	Relatives of diabetic patients	Test of significance	P value
Age: Mean (SD) years	42.4 (12.01)	36.9 (9.67)	U = 4.57	0.033
Sex: Male	31 (54.4%)	19 (33.8%)	X^2 = 4.31	0.04
Female	26 (45.6%)	38 (66.7%)		
Education:				
No formal education	7 (12.3%)	2 (3.5%)	X^2 = 4.82	0.31
Primary school	16 (28.1%)	16 (28.1%)		
Secondary school	15 (26.3%)	23 (40.4%)		
Post secondary school	14 (24.6%)	11 (19.3%)		
University	5 (8.8%)	5 (8.8%)		
Employment status:				
Employed	44 (77.2%)	52 (91.2%)	X^2 = 5.33	0.07
Unemployed	10 (17.5%)	5 (8.8%)		
Retired	3 (5.3%)	0 (0.0%)		
Nature of employment				
Civil service	13 (29.5%)	20 (38.5%)	X^2 = 0.49	0.48
Private	31 (70.5%)	32 (61.5%)		
Occupational status:				
Highly skilled Prof. I	7 (12.3%)	8 (14.0%)	X^2 = 1.65	0.65
Highly skilled Prof. II	6 (10.5%)	6 (10.5%)		
Semi skilled	25 (43.9%)	30 (52.6%)		
Unskilled	19 (33.3%)	13 (22.8%)		
Relationship of patient				
Father	4 (7.0%)	0 (0.0%)	X^2 = 32.16	0.00
Mother	5 (8.8%)	0 (0.0%)		
Spouse	10 (17.5%)	35 (61.4%)		
Sibling	18 (31.6%)	4 (7.0%)		
Cousin	2 (3.5%)	1 (1.8%)		
Others	18 (31.6%)	17 (29.8%)		
Monthly income (N)				
Mean (SD)	4544 (6881)	3928 (2515)	U = 0.506	0.450
Living together with patient	24 (42.1%)	40 (70.2%)	X^2 = 10.90	0.004
Religion:				
Traditional	0 (0.0%)	0 (0.0%)	X^2 = 0.00	1.000
Christianity	37 (64.9%)	36 (63.2%)		
Islam	20 (35.1%)	21 (36.5%)		

U = Mann-Whitney Test
X2 = Chi square test
Highly skilled Prof. I = Highly skilled professional I
Highly skilled Prof. II = Highly skilled professional II

A key relative for the purpose of this study was denied as any individual aged 18 years and above, who had been finaiclally and morally involved in patients' care during and/or prior to current admission and was responsible for, or at least contributed to crucial decisions concerning patients' care.

Data analysis

A computer analysis of the data was carried out, using EPI-INFO version 5.01b (1991). Frequency tables, cross tabulations of relevant sociodemographic/clinical variables and intervention costs of both groups were drawn up and relevant descriptive statistics/tests of significance employed. The chi-square analysis was used to examine differences between categorical variables, while non-parametric analysis such as Mann-Whitney test was used to examine distribution differences between two continuous variables which did not fulfill "normality" criteria for the student "t" test.

The Kruskal Wallis test was employed for the distribution differences between more than two continuous variables. The level of statistical significance was set at 5%.

Results

All the 114 subjects (57 each of Schizophrenics and diabetics respectively) matched for age and sex were followed up from admission to discharge within the six months period of the study.

Socio- demographic characteristics

As seen in Table 1, more schizophrenic patients were unemployed (66.7%), compared with diabetic patients (17.5%)

Table 3: Clinical characteristics of schizophreni and diabetic patients

Clinical characteristic	Schizophrenic patients n = 57	Diabetic patients n = 57	Test of significance	P value
Length of admission in days: Mean (SD)	71.3 (35.9)	12.3 (7.2)	U = 8061	0.000
Duration of episode in days: Mean (SD)	233 (271)	92 (287)	U = 47.6	0.000
Duration of illness from index illness in days: Mean (SD)	33214 (2752)	1647 (2276)	U = 17.1	0.000
No. of past hospitalizations:				
0	30 (52.6%)	36 63.2%)		
1	15 (26.3%)	8 (14.0%)	X^2 = 5.24	0.26
2	7 (12.3%)	8 (14.0%)		
3	3 (5.3%)	5 (8.8%)		
4	2 (3.5%)	0 (0.0%)		
Severity of illness	BPRScore	Blood glucose level		
At admission Mean (SD)	30.97 (4.86)	2.88.77 (36.07 mg%		
At discharge: Mean (SD)	7.53 (4.74)	108 (14.704) mg%		

U = Mann-Whitney Test
X^2 Chi square test.

and the difference in employment status was statistically significant $X'' = 30.02$; $p = 0.000$). Similarly, significantly more paitents with schizophrenia were single 26.3%) and separated (26.3%) compared to diabetes (5.3% and 1.8% respectively) $X'' = 29.2$; $p = 0.000$.

Schizophrenic patients travelled a significantly longer distance to get to the hospital than Diabetic patients $U = 57.14$; $p = 0.000$ while those with Diabetes earned a significantly higher income $u = 26.8$; $p = 0.000$.

Table 2 shows the comparison of the socio-demographic characteristics of the key relatives who accompanied the patients to the two hospitals on admission. This revealed that, more key relatives of diabetic patients (70.2%) than schizophrenic patients (42%) were currently living with the patients and this difference was statistically significant. $X'' = 10.9$: $p = 0.004$. Similarly, diabetic patients were more likely to be accompanied to hospital by spouses (61.4%) than patients with Schizophrenia (17.5%) while schizophrenic patients were more likely to be accompanied by their mothers (8.8%) than diabetic patients (0%). The differences between both groups with regard to the nature of such relationship between the patient and the key relatives who accompanied him/her to the hospital was statistically significant $X'' = 32.16$, $p = 0.00$. The key relatives accompanying the schizophrenic patients were slightly older in age, mean age (S.D) years was 42.4 (12.01) compared to diabetic patients relatives 36.9 (9.67). $u = 4.57$; $p = 0.033$.

Clinical characteristics

The mean (S.D.) length of admission of schizophrenic and diabetic patients respectively were 71.3 (35.9) and 12.3 (7.2)days and the difference as seen in Table 3 was statistically significant $u = 80.61$; $P = 0.000$.

The mean (S.D.) duration of current episode of illness for schizophrenic and diabetic patients respectively was 233 (271) and 92 (287) days ($u = 47.6$; $p = 0.000$). Similarly the mean duration of illness from index illness for schizophrenic and diabetic patients respectively was 3314 (2752) and 1647 (2276) days ($u = 17.1$; $p = 0.000$. Both groups did not differ significantly on the basis of numbers of previous hospitalization.

Table 4: Direct, indirect and total cost of inpatient management of schizophrenic and diabetics per admission

Variable	Schizophrenic Patients n = 57	Diabetic patients n = 57	Test of signifi- cance	P value
Direct cost (N) Mean (SD)	9882(4314)	7892(5778)	U = 13.7	0.000
Indirect cost (N) Mean (SD)	3604(5323)	1488(1361)	U - 1.129	0.288
Total cost (N) Mean (SD)	11337(5631)	8571(5976)	U - 15.67	0.000

U = Mann-Whitney test

Costs of illness

(a) Cost of illness per admission

Table 4 shows that the mean (SD) direct cost of treatment of schizophrenia of ₦9,882.00 per admission (4314) was significantly higher than for diabetes mellitus ₦7,892.00

Table 5: Breakdown of direct cost of treatment of schizophrenics and diabetics

Direct cost of treatment (N)	Schizophrenics	Diabetics	Test of significance	P value	Direction of significance
Transportation Mean (SD)	1562 (1232)	993 (1111)	U = 19.77	0.000	Schi > Diab
Articles/goodsd Mean (SD)	1046 (559.8)	826 (389)	U = 5.3	0.02	Schi > Diab
Pocket money Mean (SD)	1000 (552.7)	739.7 (4895)	U = 10.54	0.001	Schi > Diab
Investigations Mean (SD)	228 (214)	2117 (1135)	U = 92.87	0.000	Diab > Schi
Medication Mean (SD)	2698 (214)	2117 (3104)	U = 60.8	0.000	Schi > Diab
Feeding Mean (SD)	2133 (1081.6)	733 (427)	U = 60.8	0.000	Schi > Diab
Accommodation Mean (SD)	928 (1796)	366 (213)	U = 33.5	0.000	Schi > Diab
Occupational therapy Mean (SD)	200 (0.000)	0.000 (0.00)	U = 113.00	0.000	Schi > Diab
Registration fees Mean (SD)	25.0 (0.000)	10.0 (0.000)	U = 113.00	0.000	Schi > Diab

U = Mann-Whitney test

(5778) u = 13.7, $P = 0.000$. Similarly, the mean (SD) total cost of schizophrenia per admission ₦11,337.00 (5631) was significantly higher than for diabetes mellitus ₦8,571.00 (5976) u = 15.67, $P = 0.000$. The mean (SD) indirect cost of schizophrenia per admission ₦3,604.00 (5323) did not significantly differ from that of diabetes mellitus ₦1,488.00 (1,361) u = 1.129, $P = 0.288$. The direct cost of treatment of Schizophrenia was significantly higher than that of diabetes mellitus in all but one item of direct cost as seen in Table 5.

Table 6: Direct, indirect and total cost of in-patient management of schizophrenia and diabetess mellitus per week.

Variable	Schizophrenic Patients n = 57	Diabetic patients n = 57	Test of significance	P value
Direct cost (N) Mean (SD)	1,011(306)	4,494(1261)	U = 81.75	0.000
Indirect cost (N) Mean (SD)	168(306)	406(629)	U = 0.272	0.288
Total cost (N) Mean (SD)	1,235(647)	4,910(152)	U = 79.633	0.000

U = Mann -Whitney test

(b) *Cost of illness per week*

The mean (SD) direct cost of treatment of diabetes mellitus per week ₦4,494.00 (1,261) was significantly higher than for schizophrenia ₦1,011.00 (306) u = 81.75, $P = 0.000$. Similarly, the mean (SD) total cost of diabetes mellitus per week ₦4,910.00 (152) u=79.63, $P=0.00$ was significantly higher than for schizophrenia ₦1,235.00 (647) u=79.63, $P=0.000$. However, there was no statistically significant difference between the mean (SD) indirect cost of treatment of diabetes mellitus per week ₦406.00 (629) and ₦168.00 (306) per week for schizophrenia, u=0.272, $P=0.602$.

The effect of socio demographic and clinical factors on total cost of treatment for both groups is presented in Table 7.

The mean (S.D.) Total cost of treatment was higher for the eight patients with Insulin Dependent Diabetes Mellitus ₦16,974.00 (10,324) than for the Non-Insulin Dependent diabetics ₦7,199.00 (3526) and the difference was statistically significant (Mann- Whitney test = 6.271; $P = 0.0123$).

Discussion

The observation that 7 out of every 10 schizophrenic patients were unemployed compared with 2 out of every 10 patients with diabetes, coupled with a tendency for more of the schizophrenic patients to be engaged in unskilled jobs, to earn a lower income and to be single or separated, highlights the greater social disability of schizophrenic patients and the crippling nature of the disorder.

It was therefore not surprising that the relations largely bore the financial burden of caring for them, unlike the diabetics. The need to introduce measures aimed at alleviating such economic burden on schizophrenic patient families is therefore imperative; otherwise such patients will continue to swell the ranks of vagrant psychotics, especially when the families become overwhelmed by this burden. Schizophrenic patients travelled a significantly longer distance to reach the hospital com-

Table 7: Effect of sociodemographic and clinical factors on total cost.

Factors	Schizophrenic			Diabetics		
	Mean (SD)	Test of significance	P Value	Mean (SD)	Test of significance	P Value
Education:						
No formal education	9820 (3127)	H = 3.80	0.43	7229(3393)	H = 3.75	0.44
Primary school	12041 (5859)			7369(3137)		
Secondary school	10854 (6313)			8326(7161)		
Post secondary school	10869 (4755)			11496(8168)		
University	19054 (7341)			14660(8637)		
No. of past hospitalizations:						
0	10765 (5288)	H = 7.15	0.13	8053(5328)	H = 2.53	0.64
1	10689 (4430)			11868(9317)		
2	9758 (3325)			8968(6117)		
3	12966 (2381)			6390(1939)		
4	27843 (3629)					
Sex:						
Male	12162 (7229)	U = 0.03	0.87	7629(7390)	U = 10.84	0.000
Female	10595 (3629)			9419(4294)		
Employment status						
Employed	11966 (8156)	H = 4.40	0.11	7806(4469)	H = 1.86	0.4
Unemployed	10593 (3659)			12385(10112)		
Retired	20125 (5827)			5628(0.00)		
Nature of employment						
Civil service	9956 (6106)	H = 0.34	0.56	8403(6078)	H = 0.000	0.99
Private	12804 (8978)			7618(3926)		
Occupational status:						
Highly skilled Prof. I	31441 (0.000)	H = 5.94	0.11	15644(7412)	H = 4.23	0.24
Highly skilled Prof. II	15881 (3567)			6652(3173)		
Semi skilled	10277 (5876)			8668(7118)		
Unskilled	10838 (3567)			7545(3111)		
Marital status:						
Single/never married	12018 (6527)	H = 1.53	0.82	25824(7316)	H = 10.56	0.03
Married	10600 (5712)			7567(4339)		
Divorced	12316 (0.000)			4692(0.00)		
Separated	11968 (5383)			13180(0.00)		
	10102 (3537)			7499(2932)		
Religion						
Traditional	7468 (0.000	H = 0.76	0.68	8452(5555)	H = 0.004	0.95
Christianity	11047 (5442)			8678(6425)		
Islam	11885 (6017)					
Previous treatment						
Traditional	11770 (8234)	H = 5.12	0.16	7548(4698)	H = 2.20	0.53
Spiritual	8997 (3022)			62689(2997)		
Orthodox	12298 (8622)			9910(6321)		
Mixture	11907 (4394)			8839(6949)		

H = Kruskal-Wallis Test
U = Mann-Whitney Test

pared to patients with diabetes. This might be a reflection of the sparsely distributed psychiatric services in the country, the ignorance of patients/relatives about the location of nearby mental health facilities or the stigmatizing consequence of mental illness that leads to the non-patronage of mental health facilities nearer their domiciles.

The finding that diabetic patients were significantly more likely to be accompanied to the hospital by spouses than patients with schizophrenia appears to be a reflection of the fact that significantly more schizophrenic patients in this sample were never married. Schizophrenic illness by its nature may retard a person's ability to engage in relationships of social intimacy like marriage.

Schizophrenic patients significantly stayed longer on admission than diabetic patients. Hence, the finding in this study that the mean direct cost of in-patient treatment

per admission was significantly higher for schizophrenia is understandable. Similarly, one would have expected a concurrent significant rise in indirect cost arising from lost earnings [11]. However, their lost earnings were not commensurate with the length of stay because of their diminished capacity to engage in gainful employment as earlier highlighted [12].

In this study, the mean direct cost of treatment of schizophrenia per admission and the mean total cost of treatment of schizophrenia per admission were significantly higher than that of diabetes mellitus. These findings may reflect the significantly longer length of admission of the schizophrenic patients. However the mean direct cost and mean total cost of diabetes respectively per week were significantly higher than that of schizophrenia. This finding is in consonance with the findings of Suleiman *et al* (11). In the latter study, it was further revealed that Insulin Dependent Diabetes Mellitus (IDDM) was significantly more costly (direct cost) than the Non-Insulin Dependent Diabetes Mellitus (NIDDM).

An analysis of the inputs into direct cost of treatment per admission revealed that Schizophrenia costs more in all respects, except in the cost of investigations where diabetes was more expensive. In the latter, assessment of clinical progress required repeated biochemical investigations, whereas in schizophrenia, clinical progress is assessed by interview method/mental state assessment.

Furthermore, the cost of medication (the bulk of which are imported) contributed the highest to direct cost of treatment in schizophrenia, in agreement with findings of Suleiman *et al* [11], but at variance with European and American reports, where drug therapy accounted for only 2 - 5% of costs. The need to pursue socioeconomic policies that translate to the strengthening of the Naira, enhance local production of psychotropic medications as well as introduce subsidy to the current exorbitant financial cost of drugs used in treating Schizophrenia in Nigeria is therefore imperative.

In this study, there was a preponderance of direct cost over indirect cost of treatment for schizophrenia. This is in agreement with the finding of Suleiman *et al* [11]. One United States study [13] reported that direct and indirect costs were about the same while some European and American reports, have estimated a preponderance of indirect cost over direct cost. This apparent cultural difference in the cost of schizophrenia may be due to the fact that the indirect burden of care for the European and American Schizophrenic patients includes in-built disability payment during episodes of illness, payments for services received in half way homes, rehabilitation agencies, and other community based after-care programmes. All these add up to the indirect costs of treatment, whereas in Nigeria, such social support networks are virtually non-existent.

Conclusion and clinical implications

The mean direct cost of in-patient management of schizophrenia per admission in this study was significantly higher than that of diabetes mellitus. Direct cost was the major determinant of total cost for both schizophrenia and diabetes Mellitus. For both Schizophrenia and diabetes respectively, costs of medication ranked highest in all items of cost, while for diabetes, costs of medication and investigations were equivalent. Investigations in diabetes mellitus was significantly more costly.

In the current socioeconomic scenario in Nigeria, a dollar equal approximately ₦130.00, the National budgetary allocation to health stagnates at between 3 - 4% of National budget and most drugs used in treating schizophrenia are imported at the current exchange rate.

Therefore schizophrenia is very costly financially, thus affirming previous demonstrations of its socio-economic burden on the patient and the family, [11]. The need to reinforce the socio-economic support from the government and the larger society for schizophrenic patient is therefore imperative, so that the resources of families of these patients are not unduly strained.

It was observed in this study that some schizophrenic patients were not picked up by their relatives after discharge from in-patient status. This may be due to lack of resources on the part of relations to take them home and continue to care for them or might be due to the stigmatizing effect of having been admitted to a well-known psychiatric hospital like Aro. Such abandonment inevitably results in extra expenditure on the part of the hospital, since the intervention of social workers who will repatriate them home becomes imperative. It is also likely that it will increase the social cost of in-patient treatment of schizophrenia. Psychiatric hospitals may therefore need to integrate counselling of relatives on the ostensible social "stigma" associated with this particular condition into their treatment programme for schizophrenia.

Limitations

The results of this study are limited by its sample size as well as its inability to include some aspects of indirect, intangible and personnel costs in calculating the total costs of management. This was largely due to logistic reasons. A one-way transport fare was used across board for the patients (return-home journey excluded). This was because some schizophrenic patients were not yet picked up by their relatives after discharge from in-patient status.

Finally, the in-patient schizophrenic population used in this study may not be broadly representative of the population of patients with schizophrenia. They are more likely to fall into "severe" end of the spectrum of patients with this disorder in view of the possibility that the hospital appears to attract more of such patients.

Acknowledgements
We hereby express gratitude to the managements of the Neuropsychiatric Hospital, Abeokuta and the Federal Medical Centre, Abeokuta for the permission to carry out this study. We are also grateful to the members of staff and patients of both institutions that facilitated the conduct of the study.

References

1 Andreasen, N. **Assessment** issues and the Cost of Schizophrenia.Schizophrenia Bulletin; 1991; 17: 408 - 410.

2 Shur, E. **The** Epidemiology of Schizophrenia. British Journal of Hospital Medicine; 1988; 40: 38-45.

3 Kendell, R.E. Schizophrenia. In: Companion to Psychiatric Studies(ed. Kendell, R.E. and Zealley, A.K. , 6th Edition, Churchill Livingstone, London, 1987.

4. Andrews, G.. **The** Cost of Schizophrenia Revisited. Schizophrenia Bulletin; 1991; 17: 389 - 394.

5. Price, D.P; Kelman, and Miller, L.S. The Economic Burden of Mental **illness** Hospital and Community Psychiatry; 1992; 43: 1227-1232.

6. Davies, L. and Drummond, M.F The Economic Burden of Schizophrenia. Psychiatric. Bulletin; 1990; 14: 522 - 525.

7. Andrews, G; Hall, W; The Economic Cost of Schizophrenia. Archives of Golstein, G *et. al.* General Psychiatry; 1985: 42: 537 - 543.

8. Ojesina, J.O. Some Social and Psychological Problems of Schizophrenics in Nigeria. African Journal of Psychiatry; 1979; 5 (3 and 4): 97 - 101.

9. Martyns-Yellowe, I.S. The Burden of Schizophrenia on the family: A Study from Nigeria. British Journal of Psychiatry, 1992; 161: 779 - 782.

10. Ige, A.O. Burden of Psychiatric illness on the Family. Part II Dissertation to West African College of Physicians 1993.

11. Suleiman, T.G, Ohaeri, J.U, Lawal, R.A, Haruna, Y.H. and Orija, O.B Financial Cost of Treating Out-patients with Schizophrenia in Nigeria. British Journal of Psychiatry; 1997; 171: 364 - 368.

12. Fenton, W.S. and McGlanshan, T.H. Natural History of Schizophrenia Subtypes Longitudinal Study of Paranoid , Hebephrenic and Undifferentiated Schizophrenia. Archives of General Psychiatry 1991; 48: 969 - 977

13. Rupp, A. and Kriyh, S.J. The Costs of Schizophrenia: Assessing the Burden. Psychiatric Clinics of North America, (1993);16: 413 -423.

Received: 15/04/02
Accepted: 14/10/04