Medication adherence among outpatients at the Jos University teaching hospital.

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ABSTRACT

Background: For every 100 prescriptions written, 25 to 30 are taken properly. Non adherence to medication is a reality to be addressed by detecting the barriers in order to make interventions aimed at improving medication adherence among patients.
The aim of this study is to assess the level of medication non adherence among outpatients at the Jos University Teaching Hospital in Nigeria and to identify the factors and barriers to medication adherence among the patients; alongside educating and counseling the patients in an effort to promote adherence.

Methods: A cross-sectional prospective study was carried out for 2 months from June 2013 to July 2013 at 6 outpatient departments of the Jos University Teaching Hospital in Plateau State, Northern Nigeria. Patients visiting the departments were involved in the study after taking their consent and completing a structured questionnaire. Statistical analysis was done using Microsoft Excel and Statistical Package for Social Sciences (SPSS) version 17.

Results: Out of 324 patients, 72 (22%) were non adherent to medication. The common cause of non-adherent behavior was forgetfulness (32%). Chi square test was conducted for categorical variables and adherence to medication was positively associated with psychiatry clinic recruits, male gender, higher educational level, absence of health insurance, fewer comorbidities, longer duration of condition and therapy, asking questions and satisfactory knowledge of medicines ($p < 0.05$). The result showed that 40% (25) of the 62 non adherent patients that needed interventions were educated and counseled on the need to link frequency of administration with routine activities so as to promote adherence.

Conclusion: This study reiterates the need for a systematic assessment of adherence to medication among patients alongside proffering adequate interventions to promote adherence to medication.

Keywords: barriers, adherence, medication, out patients

Observation de médication en consultation externe au Centre Hospitalier Universitaire de Jos.

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RESUME

Contexte: Pour chaque 100 prescriptions écrites, 25 à 30 sont prises correctement. La non-observation de la médication est une réalité à traiter en détectant les barrières afin de faire des interventions censées améliorer l'observation de médication chez les patients. L'objectif de cette étude est d'évaluer le niveau de non-observation de la médication chez les patients externes au Centre Hospitalier Universitaire de Jos au Nigeria et identifier les facteurs et les barrières à l'observation de la médication chez les patients; Avec l'éducation et le conseil des patients dans un effort pour la promotion de l'observation.

Méthodes: Une étude prospective globale fut réalisée pendant 2 mois de juin 2013 à juillet 2013 dans 6 départements de consultation externe au Centre Hospitalier Universitaire de Jos dans l'état du Plateau, au Nord du Nigeria. Les **p**atients visitant les départements étaient impliqués dans l'étude après avoir reçu leur consentement et le remplissage d'un questionnaire structuré. L'analyse statistique fut faite à l'aide de Microsoft Excel et de la version 17 du logiciel (SPSS) de statistique pour les sciences sociales.

Résultats: Parmi 324 patients, 72 (22%) n'observaient pas la médication. La cause courante de la non-observation était l'oubli (32%). Le test Chi-carré était conduit pour des variables catégoriques et l'observation à la médication fut positivement associée au recrues de la clinique de psychiatrie, le sexe masculin, le niveau avancé d'éducation, l'absence d'assurance santé, la réduction en comorbidités, la durée prolongée de la condition et de la thérapie, les questions qu'on posait et la connaissance adéquate des médicaments ($p < 0,05$). Le résultat montre que 40% (25) des 62 patients non-observateurs qui avaient besoin d'interventions étaient éduqués et conseillés sur le besoin de lier la fréquence d'administration aux activités routinières afin de promouvoir l'observation.

Conclusion: Cette étude réitère le besoin d'une évaluation systématique de l'observation de la médication chez les patients avec l'offre adéquate d'interventions pour promouvoir l'observation de la médication.

Mots-clés: barrières, observation, médication, patients externes

INTRODUCTION

Adherence to medication is the connection between medical practice and patient outcomes since drugs will only work in patients who actually take them.[1] Globally, poor adherence costs approximately $177 billion annually.[2] Non adherence is the cause of 30% to 50% of treatment failures.[3] Non adherence to medications causes about 125,000 deaths annually.[4]

Adherence is defined as the extent to which a person's behavior — which includes taking medication, following a diet, or making healthy lifestyle changes — corresponds with agreed-upon recommendations from a health-care provider.[2] Medication adherence is the patient's conformance with the provider's recommendation with respect to *timing*, *dosage*, and *frequency* of medication. Three types of non adherence include non-fulfillment, non-persistence and non-conforming.[5] Non-fulfillment or primary medication non-adherence involves delaying or not filling a prescription or patients who fill the first prescription for a new medication but never take it. Patients who stop taking a medication after starting it, without the advice of a health professional are guilty of *non-persistence*. *Non-conforming* involves not taking medications as prescribed — skipping doses, taking medications at incorrect times or at incorrect doses and even taking more than the prescribed dose. Full adherence to a prescribed medication therefore includes filling of the prescription, initiation and continuation of therapy, alongside taking the medication properly.

According to a study, out of every100 prescriptions written, only 25 to 30 are taken properly.[6]

Non adherence to medication is therefore a reality that needs to be addressed by answering the question "what makes a patient non adherent to medication?" The answers elicited, better known as "barriers to medication adherence" will forearm the health care provider especially the pharmacist to make meaningful interventions aimed at improving medication adherence among patients. Aim of the study is to identify the barriers to medication adherence among outpatients at the Jos University Teaching Hospital while the specific objectives were to assess the level of medication non adherence among these patients and to identify the factors or barriers to medication adherence among outpatients at the Jos University Teaching Hospital as well as provide education and counseling to the patients in order to promote adherence to medication where necessary.

METHODS

Study design

The study was a cross-sectional, prospective study, carried out for a period of 2 months from June 2013 to July 2013. The study was carried out at 6 outpatient departments of the Jos University Teaching Hospital (JUTH), which is a tertiary care hospital in Plateau State, Northern Nigeria. The 6 outpatient departments included were:

- General Out Patient Department Clinic (Permanent site): GOPD
- Out Patient Pharmacy (Permanent site) : OPDP
- Medical Out Patient Department Clinic (Permanent site): MOPD
- Surgical Out Patient Department Clinic (Permanent site): SOPD
- Psychiatric Clinic (Temporary site): PSY
- Out Patient Pharmacy (Temporary site):OPDT

Patients visiting the above mentioned departments were involved in the study after taking their consent.

Approval

Approval to carry out the study was obtained from the Ethical Committee of the Jos University Teaching Hospital.

Sampling

Using the following sample size determination formula, we obtained a sample size of 324.

$$N = \frac{Z^2 P(1-P)}{E^2}$$

N = Sample size

Z = Standard Normal deviation at 0.05 level of significant = 1.96 (obtained from statistical table)

E = Precision of accessing level of prevalence that is acceptable error level = 5% (0.05)

P = prevalence.

A review of adherence to medication in Nigeria for different health conditions reported non-adherence figures ranging from 15% - 70%.[7-17] Therefore 70% was used as the prevalence. Inclusion criteria

Patients who met the following criteria were involved in the study:

- All patients (or caregivers) who had been taking (or administering) at least one prescription medicine for at least one week;
- and were able to communicate and understand English, Hausa , Ibo or Yoruba

Collection of data

All eligible patients were invited to complete a

structured questionnaire (appendix 1) consisting of four parts:

- socio-demographic profile,
- medication and health condition profile
- eight item Morisky Medication Adherence scale
- barriers to medication adherence

A score greater than 2 obtained on the Morisky Medication Adherence Scale was categorized as ''poor adherence (non adherence)'' and scores ranging from zero to two were categorized as good adherence.

Subsequent interventions (education, counseling) were made based on elicited barrier(s) to medication adherence

Statistical analysis of data

Statistical analysis was done using Microsoft Excel and Statistical Package for Social Sciences (SPSS) version 17. Chi square test was used for categorical variables. All p values $\leqslant 0.05$ were regarded as statistically significant.

RESULTS

Patient characteristics

Three hundred and twenty four (324) patients participated in this study and their characteristics are detailed in Table 1.

Table 1: Patient characteristics

Patient Characteristics		(N = 324)	
		n	%
Site of recruitment	GOPD Clinic (PERM)	53	16
	OPD Pharmacy (PERM)	62	19
	MOPD Clinic (PERM)	57	18
	SOPD Clinic (PERM)	54	17
	Psychiatric Clinic (TEMP)	44	14
	OPD Pharmacy (TEMP)	54	17
Age (years)	*Mean (SD)*	*41.1 (15.8)*	
	< 1	1	0.3
	1 – 19	21	7
	20 – 39	155	48
	40 – 59	105	32
	60 – 79	36	11
	80 and above	6	2
Gender	Male	150	46
	Female	174	54
Education level	Primary or below	84	26
	Secondary	114	35
	Tertiary	126	39
Occupation	Employed	245	76
	Unemployed / retired / student	73	22
	Housewife	6	2
Marital status	Married	217	67
	Single / widowed / divorced	107	33
Living alone		47	15
NHIS		66	20
Religion	Muslim	85	26
	Christian	239	74
Substance use		8	2

Three hundred and three (303) patients (table 2) had satisfactory knowledge of their medical condition(s) while 309 had knowledge of the number of comobidities.

Table 2: Patients Health Self-Assessment

Patient Characteristics		N=324	
		n	%
Number of comorbidities	*Mean (SD)*	1.0 (0.3)	
	1	286	93
	2 – 3	23	7
	Missing and excluded from sub-analysis (patients that did not select number of comorbitities)	15	
Comorbidities duration (years)	*Mean (SD)*	2.5 (4.4)	
	< 1 year	173	53
	1 – 3 years	91	28
	3 – 5 years	20	6
	> 5 years	40	12
Number of medications used	*Mean (SD)*	2.9 (2.7)	
	1	41	13
	2	105	32
		178	55
Medication duration (years)	*Mean (SD)*	2.4 (4.4)	
	< 1 year	173	53
	1 – 3 years	91	28
	3 – 5 years	18	6
	> 5 years	42	13
Perceived disease severity	Normal/Not severe /a little bit	87	27
	Severe / extremely severe	237	73
Perceived current health Status	Normal/Excellent / good	268	83
	Poor / very poor	56	17
Non-adherent to medication		72	22
Asks questions	Yes	306	94
	No	18	6
Knowledge of medicine(s)	Satisfactory	219	68
	Not satisfactory	105	32
Knowledge of medical condition(s)	Satisfactory	303	94
	Not satisfactory	21	6

Association between patient characteristics and medication adherence

Using Chi square analysis, we compared patient characteristics with good or poor adherence (Table 3a and 3b). Seventy two patients (22%) were non adherent to medication (poor adherence). Adherence to medication was positively associated with psychiatry clinic recruits, male gender, higher educational level, absence of health insurance, fewer comorbidities, longer duration of condition and therapy, asking questions and satisfactory knowledge of medicines ($p < 0.05$).

Table 3a: Association between patient characteristics and medication adherence

Patient Characteristics		Good adherence		Poor adherence		p
		n	%	n	%	
	Total Study Population	252		72		
Departments	GOPD Clinic (PERM)	43	81	10	19	<0.001
	OPD Pharmacy (PERM)	55	89	7	11	
	MOPD Clinic (PERM)	31	54	26	46	
	SOPD Clinic (PERM)	44	81	10	19	
	Psychiatric Clinic (TEMP)	40	91	4	9	
	OPD Pharmacy (TEMP)	39	72	15	28	
Age (years)	< 1	1	100	0	0	0.383
	1 – 19	11	85	2	15	
	20 – 39	128	81	30	19	
	40 – 59	81	75	27	25	
	60 – 79	28	74	10	26	
	80 and above	3	50	3	50	
Gender	Male	126	84	24	16	0.013
	Female	126	72	48	28	
Education level	Primary or below	58	69	26	31	<0.001
	Secondary	103	90	11	10	
	Tertiary	91	72	35	28	
Occupation	Employed	195	80	50	20	0.142
	Unemployed/retired/student	54	74	19	26	
	Housewife	3	50	3	50	
Marital status	Married	174	80	43	20	0.138
	Single/widowed/divorced	78	73	29	27	
Living alone	Yes	32	68	15	32	0.081
	No	220	79	57	21	
NHIS	Yes	44	67	22	33	0.015

Table 3b: Association between patient characteristics and medication adherence continues

Patient Characteristics		Good adherence		Poor adherence		P
		n	%	n	%	
	No	208	81	50	19	
Religion	Muslim	66	78	19	22	0.976
	Christian	186	78	53	22	
Substance use	Yes	5	63	3	37	0.304
	No	247	78	69	22	
	Total study population	241		68		
No. of comorbidities	1	227	80	58	20	0.010
	2 – 3	12	57	10	43	
	Total study population	252		72		
Comorbid duration- yrs	< 1 year	146	84	27	16	<0.001
	1 – 3 years	73	80	18	20	
	3 – 5 years	18	90	2	10	
	> 5 years	15	38	25	62	
No. of medications	1	32	78	9	22	0.615
	2	85	81	20	19	
	⩾ 3	135	76	43	24	
Meds. duration (yrs)	< 1 year	147	85	26	15	<0.001
	1 – 3 years	73	80	18	20	
	3 – 5 years	16	89	2	11	
	> 5 years	16	38	26	62	
Disease severity	Normal/Not severe /a little	64	74	23	26	0.265
	Severe / extremely severe	188	79	49	21	
Current health Status	Normal/Excellent / good	211	79	57	21	0.357
	Poor / very poor	41	73	15	27	
Asks questions	Yes	242	79	64	21	0.020
	No	10	56	8	44	
Knowledge of meds	Satisfactory	180	82	39	18	0.006
	Not satisfactory	72	69	33	31	
Knowledge of conditions	Satisfactory	237	78	66	22	0.481
	Not satisfactory	15	71	6	29	

Drug categories and medical conditions

The drug categories prescribed to the patients and the medical conditions reported by the patients are detailed in Tables 4 and 5 respectively. Two hundred and forty one patients reported use of different drug categories (Table 4). The others had no knowledge of their prescribed drugs. Similarly, medical conditions were known to 307 patients (table 5).

Table 4: Drug categories

Drug class	Frequency (n=241)	%
Cardiovascular system drugs	75	31
Central nervous system drugs	66	27
Vitamins and minerals	35	15
Analgesics	23	10
Anti diabetics	22	9
Ophthalmic preparations	18	7
Antibiotics	15	6
Anti inflammatory drugs	11	5
Anti histaminics (H1)	10	4
Anti asthmatics	10	4
Antacids	7	3
Anti neoplastic agents	7	3
Proton pomp inhibitors	7	3
Corticosteroids	5	2
Wound dressings	4	2
Anti histaminics (H2)	4	2
Endocrine system drugs	2	0.8
Benign prostrate hypertrophy drugs	2	0.8
Anti retro virals	2	0.8
Cough preparations	1	0.4
Disease modifying anti rheumatics	1	0.4

Table 5: Medical conditions

Medical Condition	Frequency (n = 307)	%
High blood pressure	82	27
Psychiatric conditions	62	20
Diabetes	30	10
Eye conditions	17	6
Pain	18	6
Ulcer (peptic)	14	5
Post Surgical care	12	4
Antenatal care	12	4
Cancer	8	3
Epilepsy	9	3
Asthma	10	3
Ulcer (wounds)	6	2
Typhoid	6	2
Allergy	6	2
Scaloids	4	1
Benign prostrate hypertrophy	3	1
Arthritis	3	1
Kidney disease	3	1
Stroke	3	1
Growth	2	0.7
Retro viral disease	2	0.7
Goiter	1	0.3
Constipation	1	0.3
Hernia	1	0.3
Parkinsonism	1	0.3
Cardiac insufficiency	1	0.3
Tuberculosis	1	0.3
Systemic lupus erythematosus	1	0.3
Ischemic heart disease	1	0.3
Headache	1	0.3
Fungal infection	1	0.3
Thyrotoxicosis	1	0.3
Cold	1	0.3

Barriers to medication adherence

Different reasons were given by the 72 patients for non-adherence (Table 6). The most common cause for non-adherence was forgetfulness (32%) followed by side effects (21%).

Table 6: Reasons for non-adherence to medication

Reasons for non-adherence	Frequency(n=72)	%
Forgetfulness	23	32
Side effects	15	21
Symptoms under control	15	21
Travelling	10	14
Exhausted drugs	8	11
Inconvenience	6	8
Insufficient funds	5	7
Sleeping off	5	7
Indifference	3	4
Difficulty in obtaining a new prescription	3	4
Fasting	2	3
Perceived efficacy of faith methods	2	3
No liking for drugs	1	1
Busy schedule	1	1
Too many drugs	1	1
High frequency of administration	1	1
Perceived side effect	1	1
Perceived over medication	1	1
Confusion	1	1
After food constraint	1	1

Interventions

Education and counseling interventions were made for 62 of the 72 non adherent patients, based on elicited barrier(s) to medication adherence (Table 7). The result showed that 40% (25) of the 62 patients that had these interventions were educated and counseled on the need to link frequency of administration with routine activities so as to promote adherence. The remaining 10 patients either had non negotiable barriers including "perceived efficacy of faith methods" (2 patients); "fasting" (2 patients); "insufficient funds" (5 patients) or an already resolved barrier – "perceived over medication" (1 patient).

Table 7: Education and counseling to promote adherence to medication

Education and counseling	Frequency(n=62)	%
Link frequency of administration with routine activities	25	40
Counseled patient on the importance of adhering to treatment regimen even in the absence of symptoms	19	31
Counseled patient on the need to consult with physici an if side effects occur before deciding to skip doses	14	23
Make time / have drug on you when out or travelling	12	19
Make refill a week before drugs get exhausted	6	10
Take drug before lying down – don't wait for time	4	6
Side effects occur in a small percentage of patients, use the drug first and if it occurs, consult your doctor	2	3
Synchronize the different times of drug administration	1	2
Food must not necessarily be a full meal - yoghurt, milk drink, etc qualifies too	1	2

DISCUSSION

The overall percentage of patients who were non adherent to medication was 22%. This is similar to the 28.4% found in one study on hypertensive patients.[21] Other studies carried out on hypertensive patients revealed the following rates of non-adherence: 34.9% [20]; 47% [22]; 9% [23]; and 57.1% [12]

The age interval 20 - 39 years was the most prevalent (48%). The mean age of 41.1 ± 15.8 years found in our study is less than the mean age (68.4 ±13.2 years reported in a study that assessed adherence only among chronic heart failure patients.[18] The gender distribution was almost equal (females - 54%). More females (65%) were involved in a previous study of asthmatic patients.[19] Most patients had secondary and tertiary levels of education (74%). This is similar to findings (75.9%) in a study of patients with epilepsy.[14]

Most patients were employed (76%). This is similar to the 83.6% reported in a study of hypertensive patients[12].

Sixty seven percent (67%) of the patients were married. This is higher when compared with the 44.4% reported in a study of patients with epilepsy.[14]

Only 2% of patients affirmed to substance use (drinking alcohol). This is considerably lower than the 19% (smoking) reported in another study involving asthmatic patients.[19]

Most patients were Christians (74%). This is similar to the 70% reported in another study in Nigeria.[14] Our study site is predominantly inhabited by Christians so this result is reflective.

The average number of medical conditions was 1.0 ± 0.3. This is lower than the 6.4 ± 2.4 reported in a study of patients with chronic heart failure.[18.] About half (55%) of the patients were on a minimum of 3 medicines. The average number of medicines was 2.9 ± 2.7. This is lower than the 10.6 ± 3.4 reported in a study of chronic heart failure patients.[18.] About half of the patients (53%) had their medical condition for less than a year. This sharply contrasts with the finding in another study with nearly half of the patients (48%) having their medical condition (asthma) for more than 6 years[19]. This could be attributed to late presentation and diagnosis in our setting.

About half of the patients (53%) had been on treatment for less than a year, with an average treatment duration of 2.4 ± 4.4 years. This average is low compared to the 7.7 ± 6.9 years reported in another study on hypertensive patients.[20.] Most patients (83%) rated their current health status as normal or good or excellent. This agrees with the 83.4% reported in another study of hypertensive patients.[20]

Most patients had satisfactory knowledge of their medicines (68%) and medical condition (94%).

In this study, department (site of recruitment), gender, educational level, NHIS status, number of co-morbidities, duration of medical condition and medicine use, question asking and number of medicines were found to be associated with good drug adherence ($p < 0.05$).

The rate of adherence decreased in the following order: PSY > OPDP >SOPD / GOPD > OPDT >MOPD - Site of recruitment (department) was found to be associated with adherence in this study, with the patients at the psychiatric clinic being the most adherent to medication. The rationale behind this is not clear as this even deviates from the expected norm as psychiatric patients would be expected to be less adherent due to varying levels of cognitive impairment. However, in Nigeria, the psychiatric patients have high family support and care as well as the patients/family members trying hard to avoid the stigmatization associated with their medical condition, we think these could lead to improvement in adherence.

Males > Females - The male gender was more adherent when compared with the female gender. This deviates from the popular view that women are more attentive to details and respect of rules. We think this may be because women may be forgetful due to multitasking including care for their families.

Secondary level > Tertiary level > Primary - Patients with secondary and tertiary levels of education were more adherent than patients with primary or no level of education. As expected, a higher literacy level would be positively associated with medication adherence as these patients would have a better understanding of the implications of non adherence.

Non NHIS > NHIS - In this study, patients who were not covered by the National Health Insurance Scheme (NHIS) were more adherent than those who were insured. This disagrees with the findings of another study as adherence was negatively associated with higher copayments.[25] However, the NHIS in Nigeria cover mostly federal government workers and most of our participants (over two-third) are not in this category and thus pay out of pocket. Indeed higher copayments imply the possibility of cost related non adherence.

One medical condition > 2 - 3 conditions - In one study, the number of medical conditions was positively associated with adherence.[24] This disagrees with the finding in this study; patients with 1 medical condition were more adherent to medication than patients with 2 - 3 medical conditions. We expect patients with a greater number of medical conditions to have more

drugs and have more difficulty adhering to their medication. This is confirmed in our study as the number of medical conditions was found to be negatively associated with medication adherence.

Duration of medical condition and therapy: 3 - 5 years > less than 1 year > 1 - 3 years > over 5 years. In two studies, patients with longer duration of drug use, reported better adherence than patients with shorter duration of drug use.[20,21] This is attributed to patients' having acquired enough time to get used to their treatment regimen. In this study patients with 3 - 5 years of drug use were the most adherent.

Patients asking questions > Patients not asking questions - In this study, patients who felt free to ask their care provider questions were more adherent to medication when compared with patients who were not free to ask questions. This was confirmed in another study as adherence was positively associated with being comfortable asking doctor questions.[21] Patients' freedom to communicate with their health care provider implies the existence of a trusting relationship between both parties. Patients would therefore be more apt to discuss challenges encountered with their medications and the healthcare provider would give appropriate solutions to improve medication adherence.[21]

Satisfactory knowledge of medicines > non satisfactory knowledge of medicines.

Though this study did not elicit the association of adherence with certain factors, other studies reported the association of medication adherence with these factors namely:

Age: in three different studies, older patients were found to be more adherent than younger patients.[20,26,27] This is attributed to older patients having a larger number of severe comorbidities, prompting their adherence to medication.

Occupation: in a study; patients who were unemployed or retired were more likely to be adherent.[20] This is attributed to social packages being made available for the unemployed and retired.

Perceived health status: in one study; patients who reported a health status of ''poor or very poor'' were less likely to be adherent when compared with those who reported a health status of ''excellent or good''[20] This could be attributed to pessimism existing in the former population.

Social support from a family caregiver: in one study; social support was significantly associated with better adherence as patients are better encouraged to adhere to medication.[28]

Substance use: in one study; drinking and smoking were associated with non adherence to medication as a patient's judgment was likely to be impaired.[29]

Number of medications: the number of medications was positively associated with adherence in one study.[24] Pill burden would be a factor for non adherence.

Perceived severity of medical condition: non adherence to medication was positively associated with perceived disease severity in one study as the more severe a medical condition was, the more despondent the patient would be.[30] This would lead to non adherence to medication, and hence the need for proper motivation from the healthcare provider.

Knowledge of medical condition: non adherence, was associated with lower knowledge about medical condition in one study as the more patients are knowledgeable about their condition and the implications of non adherence, the more likely they are to be adherent.[31]

The most common cause of non-adherent behavior reported by patients in this study was forgetfulness (32%). Another study also reported forgetfulness as the most common barrier in 32.4% of hypertensive patients.[12] Other studies revealed the following most common barriers:

In chronic heart failure patients, poor and complex medication instructions was the barrier to medication adherence in 71% of the non-adherent population.[18] Secondly, in asthmatic patients, poor inhaler technique or trouble operating inhalers was the barrier to medication adherence in 43.5% of the non-adherent population.[19]

Eighty six percent (86%) of the non-adherent patients in our study were counseled and educated in order to promote drug adherence. The remaining 14% were patients whose reasons for non-adherence were non-negotiable namely; perceived efficacy of faith methods, fasting, and cost related barriers. Another study also reported the use of counseling and education to promote drug adherence in 100% of non-adherent chronic heart failure patients.[18] The same study affirmed to the use of other interventions in addition to counseling and education to promote medication adherence namely; altering dosing frequency (64%), supplying medication list (32%), giving dose administration aids (20%) and following up through multiple home visits (15%). These represent the use of the above interventions.

CONCLUSION

The overall rate of non-adherence to medication was 22%. The most common cause of non-adherent behavior reported by patients in this study was

forgetfulness.

Adherence to medication was positively associated with being recruited from the psychiatric clinic, male gender, higher educational level, absence of health insurance, fewer comorbidities, longer duration of condition and therapy, asking questions and satisfactory knowledge of medicines ($p < 0.05$). Age, occupational and marital status, perceived health status, social support from a family caregiver, substance use; number of medication, perceived severity of medical condition and knowledge of medical condition were not significantly associated with medication adherence.

This study reiterates the need for a systematic assessment of adherence to medication among patients alongside proffering adequate interventions to promote adherence to medication.

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