Original Research Article

PREVALENCE AND BARRIERS TO TREATMENT COMPLIANCE AND ITS DETERMINANTS AMONG ILL SECONDARY SCHOOL STUDENTS

ABSTRACT

Compliance and adherence to medication which requires an individual to complete their medication for an illness without skipping doses is an issue for patients. This research is a secondary school-based study to determine the prevalence and barriers to medication compliance and its determinants among students with acute illness in Elele, Ikwerre Local Government Area, Rivers State, Nigeria. This is a cross-sectional descriptive study. The study was conducted in Adventist Comprehensive High School (ACHS) Elele, Ikwerre LGA, a semi urban area of Rivers state, between July-August 2021. Using a purposive sampling technique, 104 students met the inclusion criteria. The instrument for data collection is a standardized univariate questionnaire called Morisky Medication Adherence Scale that is normally used to measure the level of compliance to medication. Data collected were presented in frequencies and percentages in tables, pie charts and bar charts using Microsoft Excel 2016 Version. Data were analysed using bivariate analysis (Chi-square test/Fisher's Exact test) to test for association between socio-demographic factors and medication adherence (Compliance) at 95% CI. Result from the study showed that 88.5% of patients had low compliance while, only 11.5% showed moderate to high compliance to medication among patients attending ACHS Clinic. Similarly, the reasons for intentionally low adherence to medication included; studying, unpleasant taste of the drug, fear of taking too many drugs and absent health worker in the sick bay, while, forgetfulness was the key reason for unintentional low compliance. Also, snacking was a common habit among low adherent students (about 78%). Low compliance to prescribed medications amongst the students was observed to be high due to studying, unpleasant taste of medication, fear of taking too many drugs, unavailability of health worker in sick bay and forgetfulness among secondary school students presenting for treatment with acute illness. Hence, medications with pleasant tastes, few drugs yet effective for presented illness and employment of a school stationed health worker are advised. Also, notice should be passed to the student's parents/guardian to supervise the compliance of students to medication at home. Finally, supervision both in school and at home is a leeway to improving medication compliance.

Key words: Prevalence, Barrier, Treatment Compliance, Medication Adherence, Secondary School

1. INTRODUCTION

Understanding the etiology of illness states has progressed significantly, and the introduction of new treatment drugs has made it possible to cure or reduce symptoms. However, in many cases, medications are not utilized in a way that provides the most benefit and safety. Patients' reluctance or partial compliance has been blamed for efforts to maintain or enhance health falling

short of the goals considered realistic [1]. Medication adherence (taking one's medications exactly as recommended) is a key concern because it reduces up to 5.5 percent of hospitalizations and increases mortality due to medication errors by 8.48 times. Treatment completion is hampered by the high cost and a lack of knowledge of the treatment's instructions [2]. Only half of people who are prescribed long-term therapy for chronic illnesses finish it, according to the World Health Organization. Due to cognitive challenges, depression, or physical problems, half of all prescriptions for medications to be taken on a regular basis are either not filled or never filled at all [3, 4]. Medication for asymptomatic diseases is unlikely to be used carelessly, as it could result in long-term complications, particularly with conditions such as diabetes, high blood pressure, or high cholesterol [2]. According to the American Heart Association, approximately 60% of patients who are taking five or more medications become confused while doing so.

Young people are occasionally known to play some level of truancy when ill especially if they need it to avoid going on an errand or taking medications. Experiences from health workers has suggested that students in boarding secondary schools could run to school clinic pretend to be sick so as to catch some rest during class hours, and if a diagnosis is made that may require medications, they may not swallow medication when given yet admits to swallowing it. Several factors may account for this which may be intentional or unintentional. Illness (acute) require short course of medication and when people feel some relief they may not bother to adhere to prescription as per completing the dose. Poor compliance to medication leads to poor health outcomes, increased medical costs and increased death rate due to acute malaria or gastroenteritis in resource restrained environments like Nigeria.

2. MATERIALS AND METHOD

Study Area: The study was conducted in Adventist Comprehensive High School (ACHS) Elele, Ikwerre Local Government Area of Rivers State, Nigeria, a semi urban area of Rivers state, between July-August 2021.

Research Design: This study is a cross-sectional descriptive study. The cross-sectional study descriptive study involved data collection at one point in time to assess the prevalence and barriers to medication adherence ill among secondary school students.

Determination of Sample Size: The formula by [5] for determining sample size was used to draw the sample size from the relatively large population of the study area. The sample size was calculated using the formula for populations more than ten thousand. A minimum of 184 subjects were recruited for the study for which 104 met the inclusion criteria. The formula is given below;

$$N = \frac{Z^2 \text{ x P x } 1 - \text{P}}{d^2}$$

Where;

N = minimum sample size required

Z = Confidence level (95%)

P = Standard deviation

d = margin of error

Instrument for Data Collection: The instrument for data collection is a standardized univariate questionnaire called Morisky Medication Adherence Scale that is normally used to measure the level of compliance to medication. MMAS-8 is an easily administered eight-item scale which measures a specific medication-taking behaviour. Each item is rated as 0 or 1 based on the No/Yes response to the individual questions. Cronbach's alpha reliabilities of the questionnaire were found to be 0.86 and 0.89 for medication adherence and their barriers, respectively. Based

on the scores obtained, participants who scored less than 6 were categorized as low adherence, 6-8 as moderate/high adherence.

Calculation of Percentage Compliance:

$$Percentage\ Compliance = \frac{Level\ of\ compliance}{Total\ Level\ of\ Compliance}\ x\ 100$$

Inclusion Criteria: Our respondents were secondary school boarding students - Junior Secondary (JS) to Senior Secondary (SS) who attended school clinic and were given medications for treatment. Of the 184 questionnaires filled completely and returned, only 104 of the students met the criteria as above. The power of the study was deduced to be a total of 104 patients out of 184 school students (respondents) who attended the school clinic to be treated for some medical condition or complaints. Eighty (80) of these respondents were not receiving treatment for any medical problem. Only the 104 (56.5%) of the respondents who were prescribed medication were used for the study, as such, purposive sampling technique was employed to pick only students who met the criteria for inclusion.

Method of Data Analysis: Data collected were presented in frequencies and percentages in tables, pie charts and bar charts using Microsoft Excel 2016 Version. Data were analysed using bivariate analysis (Chi-square test/Fisher's Exact test) to test for association between socio-demographic factors and medication adherence (Compliance) at 95% CI.

3. RESULT

A total of 104 patients out of 184 students who attended the school clinic are being treated for some medical condition or complaints while, 80 of the respondents were not receiving any medication. As such, only the 104 (56.5%) of the respondents will be used for the study.

The study also observed some common medical conditions of patients attending the school clinic, and it was also observed that the following illnesses were prevalent; chest pain, cold, ulcer, malaria, eye defect and allergies. (See result in Figure 1)

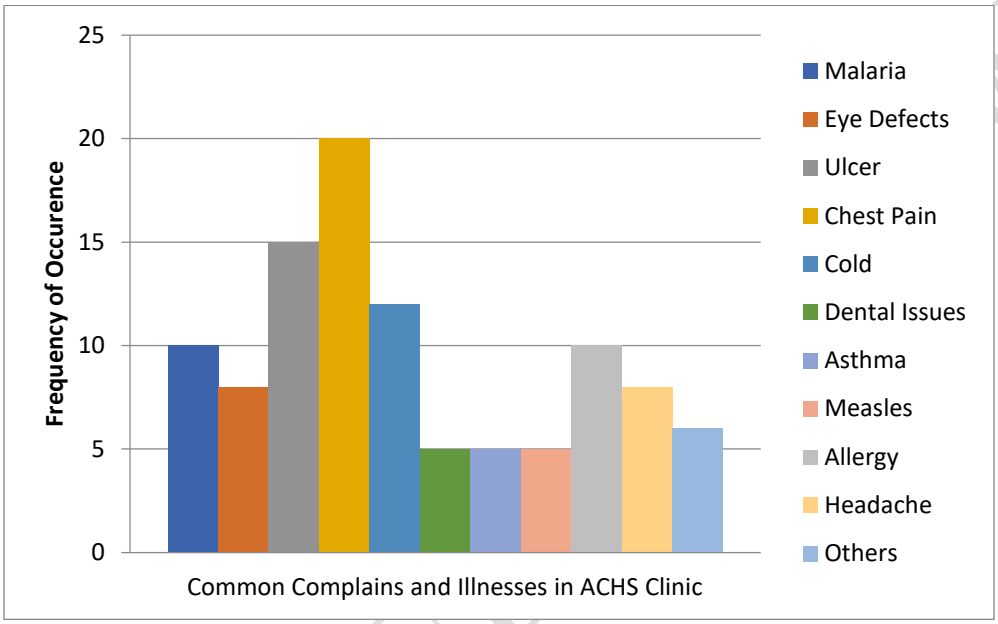

Figure 1: Common Complaints and Illness among patients attending school clinic

The demographic features of the respondents reveals 53.8% were males and 46.2% were females, with 57.7% of them in the Junior secondary (JS) class and 42.3% of them in the senior secondary class (SS). Students 12years and younger constituted 40.4 % of the respondent (See Table 1)

Table 1: Presentation of Demographic data of the Participants

Age	**Frequency**	**Percent (%)**
below 12	42	40.4
12-14yrs	34	32.7

15yrs and above	28	26.9
Total	**104**	**100.0**

Gender	**Frequency**	**Percent (%)**
Male	56	53.8
Female	48	46.2
Total	**104**	**100.0**

Class	**Frequency**	**Percent (%)**
JS	60	57.7
SS	44	42.3
Total	**104**	**100.0**

The results of the percentage distribution of responses by patients who were given the Morisky Medication Adherence (compliance) Scale to measure their level of adherence to medication showed that majority of the respondents affirmed low adherence to most of the items on the scale, which is six out of eight (6 out of 8) items that made up the scale.

However, on the level of non-compliance (low adherence) to medication, the following scoring and interpretation method was adopted as recommended by the scale developer [6]; response choices are “YES” or “NO” for items 1 through 7 and item 8 has a five-point Likert response scale. Each “NO” response is rated as 1 and each “YES” response is rated as 0 except for item 5, in which each “YES” response is rated as 1 and each “NO” response is rated as 0. For item 8, the code (0-4) has to be standardized by dividing the result by 4 to calculate a summated score. Total scores on the MMAS-8 range from 0 to 8, with scores of 8 reflecting high compliance, 7 or 6 reflecting medium compliance, and <6 reflecting low compliance [7]. Therefore, for the purpose

of this study, the interpretation was modified because of the insignificant number of patients who scored 8;

- Low compliance (Non-adherence) – below 6
- Moderate/High compliance (Adherent) – between 6 to 8

Table 2: Percentage Distribution of patients' response to the MMAS

S/N	Items/statement	Yes	%	No	%	Rank
1	Do you sometimes forget to take your medication?	90	86.5	14	13.5	A
2	Over the past 2 weeks, were there any days when you did not take your medicines?	58	55.8	46	44.2	A
3	Have you stopped taking medications because you feel worse when you took it?	32	30.8	72	69.2	D
4	When you travel or leave home, do you sometimes forget to bring along your meds to school?	56	53.8	48	46.2	A
*5	Did you take your medicine yesterday?	42	40.4	62	59.6	A
6	When you feel like your health is under control, do you sometime stop taking your meds?	72	69.2	32	30.8	A
7	Do you feel disturbed about sticking to your treatment plan?	36	34.6	68	65.4	D
8	How often do you have difficulty remembering to take all your meds?	66	63.5	38	36.5	A
			54.3		**45.7**	

*Negative Question/Item and should have a reverse scoring

Concerning levels of medication compliance, the result (see table 3) revealed that 88.5% of patients had low compliance while, only 11.5% showed moderate to high compliance to medication among patients attending ACHS clinic. The result showed an overwhelming evidence of low compliance (non-adherence) to medication and consequently will have clinical implications on patients. Thus, non-adherence to medication is prevalent in majority of patients that were treated in ACHS clinic.

Table 3: Level of adherence (Compliance) (compliance) to Medication among Patients attending ACHS clinic

Level of compliance	Frequency	Percent (%)
Low	92	88.5
Moderate/High	12	11.5
Total	**104**	**100.0**

The results for what factors were responsible barriers to medication compliance among patients treated in ACHS clinic captured- *intentional* and *unintentional barriers* to low compliance. Thus, the patients used for this part of the study were only those who showed low compliance to medication (about 92 patients). The result affirmed that both intentional and unintentional non-adherence is common among patients used in this study. Therefore, the common barriers to medication compliance are highlighted below based on their percentages.

Table 4: Factors were responsible barriers to medication compliance among patients

	Factors	No.	%
For intentional Non-adherence	Busy studying	28	30.4%
	Unpleasant taste	23	25%
	Fear of taking too many drugs	20	21%

	Unavailability of health worker in sick bay	12	13%
For unintentional Non-adherence	Forgetfulness	9	10.6%
	N	**92**	**100**

The result as shown in Fig. 2 below reveals that patients who were treated at ACHS clinic largely preferred to snacks instead of cooked school meals, this was affirmed by 75% of the patients. While, Fig. 3 highlights how often patients engage in physical activities. The result revealed that 63.5% engage in physical activities one to three times a week, only 5.7% exercise for more than 3 times a week, 11.5% said they are inconsistent while, 19.2% stated that they do not engage in any physical activities.

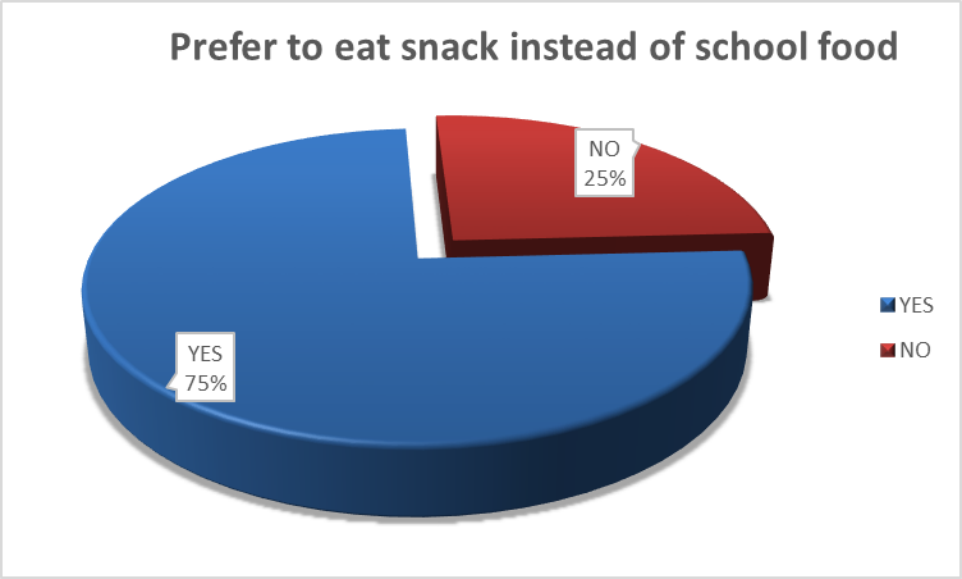

Figure 2: Frequency of Physical Activities among Patients

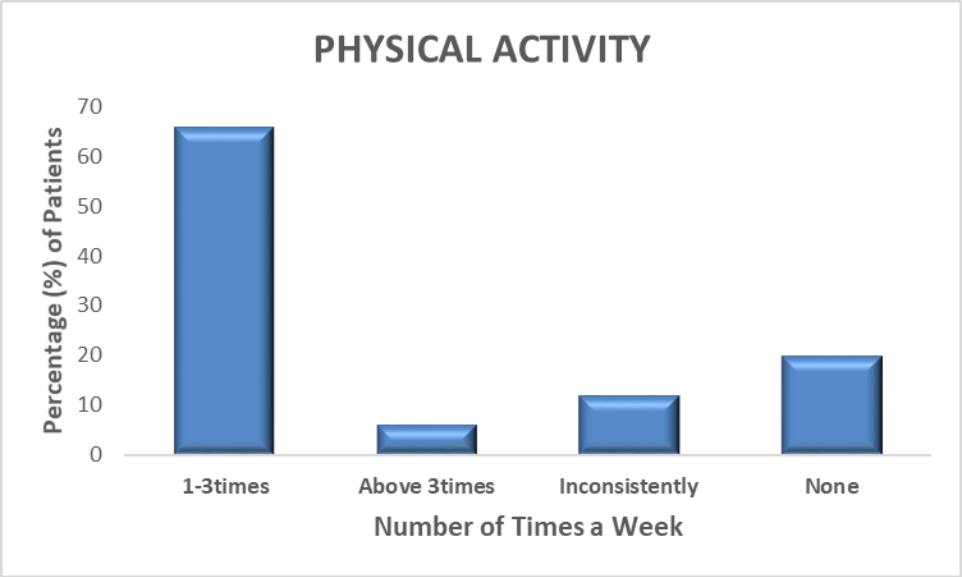

Figure 3: Frequency of Physical Activities among patients

4. DISCUSSION

Although [8] reported age as a factor for determining compliance, the findings in this study revealed that the differences that existed were not statistically significant across gender, age and class, as all the categories maintained low compliance scores. In 2020, [9] study showed that medication adherence was significantly decreased and had a significant positive correlation with gender and economic status, while it had a negative correlation with age. At present, this is the first study about medication compliance among a population of boarding secondary school students at a community level. Several researches in most recent past have limited their studies to adults with chronic diseases and the relevance of the outcomes to prescription drug users in general has been unclear [10]. To increase the success of drug intervention in acute illness, drug

compliance and adherence is a major part of the solution. The low compliance to treatment has significant adverse consequences and impedes effectiveness of the treatment protocol. Hovstadius and Petersson [11] noted the concerns associated with under-treatment in current clinical practice, because it leads to complications, an increase in the number of hospitalizations and cost of treatment. [10] averred that in industrialized countries, compliance to treatment by patients with chronic diseases is about 50%. Our results showed 88.5% of low compliance to medications. Thirty percent of the interviewed participants by Unni and Farris [12], claim forgetfulness as the reason for their low compliance, this study found 67% of forgetfulness accounting for unintentional low compliance thus making it a prominent reason for unintentional low adherence. Study by Lakshmi [13] found 35% were unintentional and the major reason was forgetfulness (23.6%). Using the MMAS-8, this study identified an intentional and unintentional behaviour that causes low compliance [6]. Intentional reasons according to this study for low medication compliance were due claims by respondents to be busy studying (82.6%); unpleasant taste (78.3%), fear of taking too many drugs (74%); unavailability of health worker in sick bay. Intentional low compliance indicates a lack of understanding and misconceptions regarding the intensity of a health condition [10]. This behaviour can be related to lack of concordance intended as the fact that the Health workers and patients must come to an acceptable treatment regimen for the patient. Taking medications continuously and according to the instructions of the Physician is an important aspect of drug treatment. This aspect, however, does not seem to be considered by the patients, the analysis in this study showed that no more than 11.5% of patients have a moderate/high level of compliance. Samuel [14] indicated that 72.0% of secondary school students were treated for headache and 69.0% received malaria treatment; [15] ranked diseases such as malaria (87.4%), diarrhoea (79.5%), cough (58.2%), etc as common diseases adolescents

experience in schools. The findings in this study also confirmed malaria as one of the common complaints although chest pain, cold and ulcer were mostly reported by the respondents, and we observed that they were largely uninterested in eating school food hence the reason for snacking. Further analysis showed that class level significantly influenced the snacking habits and physical activities of patients attending school clinic. This study revealed 9 out of every 10 senior students who had low compliance preferred to snack. [16] revealed that when low compliance is identified, responding to the patient for being forthcoming with appreciation and sharing their behaviour is very important. Recognizing their reason for non-adherence as legitimate leads to a fruitful non-confrontational discussion is followed by a tailored solution. Responding with motivational interviewing techniques is helpful.

5. CONCLUSION

Not very many studies have looked at medication compliance is boarding secondary school students so it may be new in very many ways. This study found that 88.5% of patients had low compliance while, only 11.5% showed moderate to high compliance to medication among patients attending ACHS clinic. Low compliance to prescribed medications amongst the students was observed to be high due to studying, unpleasant taste of medication, fear of taking too many drugs, unavailability of health worker in sick bay and forgetfulness among secondary school students presenting for treatment with acute illness. Hence, medications with pleasant tastes, few drugs yet effective for presented illness and employment of a school stationed health worker are advised. Also, notice should be passed to the student's parents/guardian to supervise the

compliance of students to medication at home. Finally, supervision both in school and at home is a leeway to improving medication compliance.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

RECOMMENDATION

It is recommended that measures to best prevent medication non-compliance among secondary school students should be put in place by school management, parents/guardians and healthcare workers.

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ANNEXURE 1

Gender * Unpleasant taste

Crosstab

			item15		Total
			NO	YES	
Gender	Male	Count	20	36	56
		% within Gender	35.7%	64.3%	100.0%
	Female	Count	8	40	48
		% within Gender	16.7%	83.3%	100.0%
Total		Count	28	76	104
		% within Gender	26.9%	73.1%	100.0%

X^2 (1) = 4.77 with P< 0.05, **Significant**

Forgetfulness * Gender

			Gender		
			Male	Female	Total
item19	NO	Count	22	8	30
		% within Gender	45.8%	18.2%	32.6%
	YES	Count	26	36	62
		% within Gender	54.2%	81.8%	67.4%
Total		Count	48	44	92
		% within item19	52.2%	47.8%	100.0%

X^2 (1) = 7.99 with P< 0.05, **Significant**

Fear of taking too many drugs*Class

			Class		
			JSS	SS	Total
item13	NO	Count	18	6	24
		% within Class	34.6%	15.0%	26.1%
	YES	Count	34	34	68
		% within Class	65.4%	85.0%	73.9%
Total		Count	52	40	92
		% within item13	56.5%	43.5%	100.0%

X^2 (1) = 4.522 with P< 0.05, **Significant**

Forgetfulness * Class

			Class		
			JSS	SS	Total
item19	NO	Count	22	8	30
		% within Class	42.3%	20.0%	32.6%
	YES	Count	30	32	62
		% within Class	57.7%	80.0%	67.4%
Total		Count	52	40	92

X^2 (1) = 5.12 with P< 0.05, **Significant**

Snacking * Class for non-adherent group

Crosstab

			Class		Total
			JSS	SS	
item21	NO	Count	16	4	20
		% within item21	80.0%	20.0%	100.0%
		% within Class	30.8%	10.0%	21.7%
	YES	Count	36	36	72
		% within item21	50.0%	50.0%	100.0%
		% within Class	69.2%	90.0%	78.3%
Total		Count	52	40	92
		% within item21	56.5%	43.5%	100.0%
		% within Class	100.0%	100.0%	100.0%

X^2 (1) = 5.732 with P< 0.05, **Significant**

Snacking * Class

			Class		
			JSS	SS	Total
item21	NO	Count	20	6	26
		% within item21	76.9%	23.1%	100.0%
		% within Class	33.3%	13.6%	25.0%
	YES	Count	40	38	78
		% within item21	51.3%	48.7%	100.0%
		% within Class	66.7%	86.4%	75.0%
Total		Count	60	44	104
		% within item21	57.7%	42.3%	100.0%
		% within Class	100.0%	100.0%	100.0%

X^2 (1) = 5.25 with P< 0.05, **Significant**

Class * Physical Exercise

Crosstab

			modified_item22				
			1-3times	Above 3 times	inconsistently	None	Total
Class	JSS	Count	44	4	4	8	60
		% within Class	73.3%	6.7%	6.7%	13.3%	100.0%
	SS	Count	22	2	8	12	44
		% within Class	50.0%	4.5%	18.2%	27.3%	100.0%
Total		Count	66	6	12	20	104
		% within Class	63.5%	5.8%	11.5%	19.2%	100.0%

X^2 (1) = 7.858 with P< 0.05, **Significant**