Original Research Article

PREVALENCE AND BARRIERS TO TREATMENT COMPLIANCE AND ITS DETERMINANTS AMONG SECONDARY SCHOOL STUDENTS WITH ACUTE ILLNESS IN IKWERRE LOCAL GOVERNMENT AREA OF RIVERS STATE, NIGERIA

Comment [LKK1]: Recommended to rephrase the title especially the word "acute illness" and add the year of study conducted.

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. When people feel some relief or even feel better they may not bother to adhere to prescription with regard to completing the dose. Poor compliance to medication comes with significant medical implications including poor health outcomes and high cost of treatment. 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. 104 met the inclusion criteria, using a purposive sampling technique. 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 were analysed using bivariate analysis (Chi-square test/Fisher's exact test) to test for association between socio-demographic factors and medication compliance at 95% CI.

Comment [LKK2]: Recommended to highlighted the calculation of sample size for the study

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. 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 among secondary school students presenting for treatment with acute illnesses. It is recommended these students be made to take these medications under supervision as a leeway to improving compliance.

Comment [LKK3]: The Conclusion is not complete

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

1. INTRODUCTION

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. Acute illness 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.

Comment [LKK4]: Recommended to highlighted the prevalence of previous study in other countries and in Nigeria

The Morisky Medication Adherence Scale (MMAS), also widely known as the Morisky Scale (MMAS-8) is an age long validated assessment tool reserved for the measurement of medication compliance in a variety of population [1]. The wordings of the questions were rephrased in such a way as to minimize bias and elicit certain behaviours exhibited by boarding secondary school students who use school clinic when acutely ill. The responses that followed allows for the patient to respond to questions about poor compliance in a way that ensures full disclosure for the researcher. If a patient scores higher on the scale, they are evaluated as more adherent (moderate to severe adherence). If they score lower on the scale, the interpretation that follows represents low compliance. Besides using MMAS-8 structured questionnaire, this study accesses

Comment [LKK5]: The instrument should be in Method section

intention or non-intentional concerns of poor adherence in student-patients attending school clinic. By understanding how the patient scored on the scale, this study identifies underlying issues that prevent patients from taking and or completing their medications correctly when ill, if at all. With the rising incidence of non-adherence to medication, it will be necessary to know what percentage of acutely ill patients in boarding secondary schools within rural settings are adherent and what barriers influence low adherence alongside what corrective measures (if any) will be needed and at what level it should start. To date, not very many studies have focused on medication adherence in boarding secondary school students in rural setting. This makes the study significant.

Comment [LKK6]: Rural setting should be in Title

2. MATERIALS AND METHOD

The school Principal, teachers and students were presented with the research questions of the study and assured of confidentiality and anonymity in case information contrary to school regulations was disclosed; their approval was sought and obtained. Respondents were informed of their absolute freedom to opt in or out of the study at any time. Permission for students to participate in the study was granted by the school principal. Our respondents were secondary school boarding students- Junior Secondary (JS) to Senior Secondary (SS) who attended school clinic and were given medications for treatment. A cross sectional descriptive survey was employed in this study. Of the 184 questionnaires filled completely and returned, only 104 of them 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

Comment [LKK7]: Recommended to highlighted the required sample size. Please insert the formula in this section

Comment [LKK8]: Please highlighted how the data collection was conducted ? Who are responsible to collect the data ?

medication were used for the study, as such, purposive sampling technique was employed to pick only students who met the criteria for inclusion.

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.

This study answers questions as (i) what is the prevalence of medication adherence of acutely ill patients attending a school clinic in Ikwerre Local Government Area (LGA)? (ii) Is low adherence to medication intentional or non-intentional? And (iii) what are the behaviours/lifestyle of acutely ill patients attending Adventist Comprehensive High School (ACHS) Clinic in Ikwerre LGA? Data were analyzed using SPSS version 25.0. Continuous variables were summarized as mean (standard deviation). Prevalence of low adherence was summarized as proportion with 95% confidence interval (CI). Bivariate analysis (Chi-square test/Fisher's exact test) was used to find the association between socio-demographic factors and medication compliance. Simple linear regression was used to compare scores of medication treatment barriers for patients who were classified as low adherence versus moderate/high compliance. Determinants of low compliance to medication were identified using multivariate logistic regression analysis, considering medication compliance as dependent variable and gender, age category, class as explanatory variables. We calculated adjusted prevalence ratio (PR) ratio to identify the factors associated with medication compliance with 95% CI was calculated. *P* value less than 0.05 was considered statistically significant.

Comment [LKK9]: Not important

Comment [LKK10]: Too long, should summarized further

Comment [LKK11]: There are no bivariate analysis and 95% CI. Please check the result

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 (See Table 1).

Table 1: The number of Patients treated for any Medical problems

	Response	Frequency	Percent
Patients taking treatment	**YES**	**104**	**56.5**
	NO	80	43.5
	Total	184	100.0

Comment [LKK12]: Recommended to just highlighted in writing, as the table 1 is not important finding.

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)

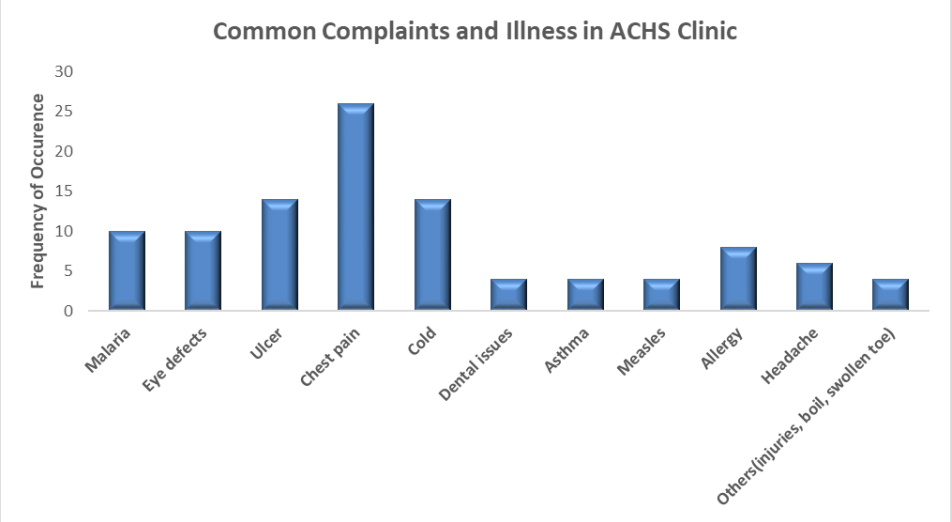

Figure 1: Common Complaints and Illness among patients attending school clinic

Comment [LKK13]: Is this from 104 patients ?..If not, it is not related to the study

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 2)

Table 2: Presentation of Demographic data of the Participants

Comment [LKK14]: Figure 1 can combine in Table 2

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**

To answer the question of what is the prevalence of medication adherence of acutely ill patients attending a school clinic in Ikwerre Local Government Area (LGA), frequency counts and percentages were used (See Table 3). 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.

Comment [LKK15]: This paragraph shoul not be in Result section..It's repeated from method section.

However, the answer the research question on the level of non-compliance (low adherence) to medication, the following scoring and interpretation method was adopted as recommended by the scale developer [2]; 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 [3]. 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 3: 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 4) 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 4: 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**

Comment [LKK16]: Recommended to highlighted how to calculate the low compliance ?

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.

Comment [LKK17]: Should highlighted the important result from the Table 5

Table 5: Factors were responsible barriers to medication compliance among patients

For intentional Non-adherence	Busy studying	82.6%
	Unpleasant taste	78.3%

	Fear of taking too many drugs	74%
	Unavailability of health worker in sick bay	61%
For unintentional Non-adherence	Forgetfulness	67.4%

More so, further analysis revealed that some barriers to medication were significantly influenced by students' demographics such as gender, age and level (Junior or Senior). Females 83.3% and 81% times more likely to complain about unpleasant taste and forgetfulness respectively as a barriers for low compliance, worsen as they moved higher in class as a predictor to low compliance. As regards the behaviours/lifestyle of patients attending ACHS clinic in Ikwerre LGA, two items were used to measure patients eating habit and physical activity. 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.

Comment [LKK18]: What is the eating habit and Physical activity have to do with the compliance ?

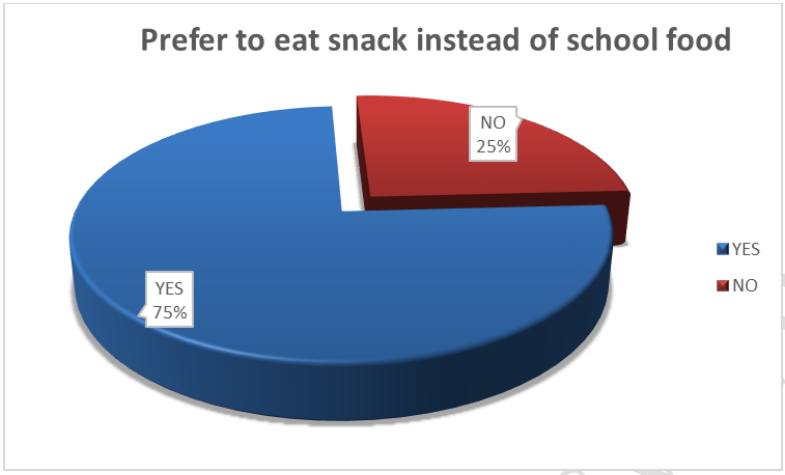

Figure 2: Frequency of Physical Activities among Patients

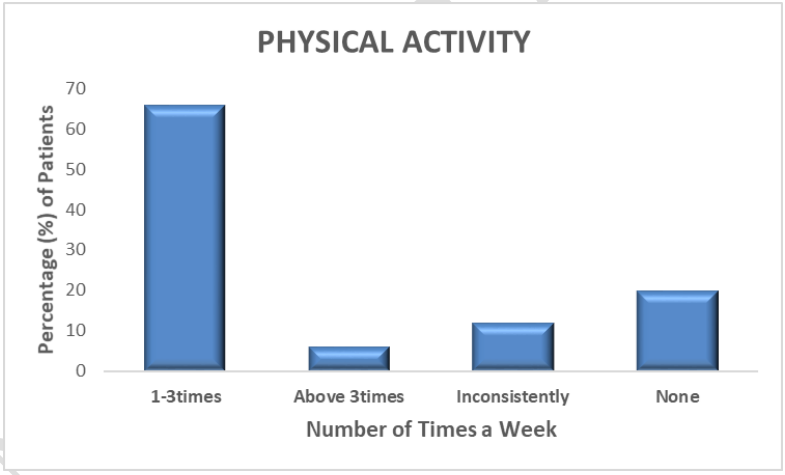

Figure 3: Frequency of Physical Activities among patients

4. DISCUSSION

Although [4] 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, [5] 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 [6]. 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 [7] 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. [6] 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 [8], 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 [9] 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 [2]. Intentional reasons according to this study for low

Comment [LKK19]: No statistical analysis done in the result section

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 [6]. 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 in 2019 indicated that 72.0% of secondary school students were treated for headache and 69.0% received malaria treatment; [10] 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 (see Fig. 2). 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. [11] 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

Comment [LKK20]: Please review for the language

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. The reason for being intentionally low adherent span across areas of student claiming to be studying, unpleasant taste of the drug and fear of taking too many drugs. Absent health worker in the sick bay and forgetfulness played a significant role in contributing to unintentional low compliance. This study also observed that being a female in the senior class predicted low compliance and snacking and exercise were common behaviours with low medication adherence.

Comment [LKK21]: No statistically analysis done for this

6. RECOMMENDATION

Comment [LKK22]: Very poor recommendation, please rephrase

However is may be extremely important to track students using school alarms or bells and ensuring hostel master and mistresses help remind students on the need to adhere strictly to prescribed medication especially among females and senior students. Emphasis should be made to improve quality and taste of food so as to discourage snacking especially when students are ill as healthy meals aid quick recovery. The need for exercising could improve immune function and this will help reduce risk for falling ill and requiring school clinic care in the first instance. Inquiring about medication-taking behaviour in a nonjudgmental and blame-free atmosphere is key.

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Comment [LKK23]: Please refer to reference writing format

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