

## TREATMENT COMPLIANCE AMONG WOMEN WITH PREGNANCY INDUCED HYPERTENSION ATTENDING SELECTED HEALTH FACILITIES IN RACHUONYO NORTH SUB-COUNTY, HOMABAY COUNTY, KENYA

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*Submitted 17<sup>th</sup> November 2021, Accepted 08<sup>th</sup> May 2022, Published 20<sup>th</sup> December 2022*

### ABSTRACT

Treatment compliance among expectant women with pregnancy-induced hypertension (PIH) is a global health challenge. Gestational hypertension remains a leading cause of Maternal and infant mortality and morbidity. However, very little has been done to mitigate the situation. The general objective of this study was to assess treatment compliance among women with gestational hypertension in Rachuonyo North Sub-County. The specific objectives were to establish the socio-demographic factors that affect compliance, to determine the level of knowledge and to establish the health system factors affecting treatment compliance. A cross-sectional study was undertaken targeting pregnant women aged 15-49 years with gestational hypertension. Data was collected using structured questionnaires, Focused Group Discussion guides and Key Informant Interviews. A total of 175 women responded. The women who were pregnant, had been diagnosed with gestational hypertension and were on treatment for at least one month were included in the study. Two doctors, two clinical health officers, and two Nurses were included as key informants. Data was analyzed using Chi-Square, Fishers Exact, and Mann-Whitney U-test. Treatment compliance was 18.3% whereas level of knowledge was 68.1%. Age ( $p=0.007$ ), education ( $p=0.038$ ), explanation of gestational hypertension ( $p=0.001$ ), medication counseling ( $p=0.024$ ) and frequency of follow up ( $p<0.001$ ) were significantly associated with treatment compliance. However, education level was the only significant factor that could predict treatment compliance with respondents who had completed primary schools being 4.968 times more likely to comply (O. R= 4.968,  $p=0.05$ ) compared to those who had not completed primary. The study findings are useful for planning and designing appropriate interventions for improving treatment compliance among women with gestational hypertension

Key Words: compliance, pregnancy induced hypertension, Rachuonyo North Sub-County, HomaBay County

## I. INTRODUCTION

Pregnancy-induced hypertension (PIH) is a condition of high blood pressure during pregnancy that occurs after 20 weeks of gestation (Barra et al., 2012.). Global statistics indicates that the incidence of PIH has been estimated at 5% - 14% of all pregnancies. In developing countries, pregnancy- induced hypertension is the second most obstetric cause of still birth and early neonatal deaths, while worldwide it is the third leading pregnancy related cause of death after hemorrhage and sepsis. The estimated 790 maternal deaths per 100,000 live births accounting for 23.6% (NGQPOC, 2004). According to Sajith et al. (2014), pregnancy-induced hypertension is categorized into three typical stages; chronic hypertension, gestational hypertension and preeclampsia.

### Statement of the Problem

More than half of globally reported maternal deaths occur in sub-Saharan Africa (WHO, 2015). Of these deaths, hypertensive disorders were the second cause at 14.0% (Say et al., 2014), and it complicates eclampsia 14 times more than developed countries (Dolea et al., 2000). Kenya is considered to have made insufficient progress in reducing maternal mortality which as of 2015 it stood at 510/100,000 live births, a reduction of 17%, while infant mortality rates stand at 39/1000 live births (WHO, 2015; World Bank, 2015; KNBS, 2015; WHO, 2014). HomaBay is among the leading counties with high maternal mortality (583/100,000 live births) and infant mortality rates (51/1000 live births) (KNBS, 2011; UNFPA, 2014). Rachuonyo North is within HomaBay County. The problem of PIH is compounded by several other challenges like poverty levels estimated at 44% (Commission on Revenue Allocation, 2011). Regarding infrastructure, only 12 of the 147 public health facilities in HomaBay have the equipment to diagnose high blood pressure in pregnant women, and only a few (20% in Nyanza) can treat high blood pressure and fatal complication in pregnancy (MOH, 2010; MOH, 2016). Treatment compliance is critical in managing PIH, yet noncompliance is a growing concern worldwide, both developed and developing countries (Meads et al., 2008). Antihypertensive medication use has been associated with decreased severe maternal hypertension, fewer prenatal admissions to hospital, and fewer instances of respiratory distress syndrome in the newborn but non-compliance are related to poor pregnancy and health outcomes, it increases the cost of care and interventions to improve compliance are rare in the provision of health care. Little

information is available on the rate of adherence to PIH medication and the factors that affect compliance nationally and in Rachuonyo North sub-county. This study came up with the strategies of patient education on pregnancy-induced hypertension and its treatment and more information on risk of non-compliance. Follow-up on continuous medication education among the medical personnel to understand the risk of noncompliance. Against this background, this study sought to assess treatment compliance among pregnant women with pregnancy induced hypertension in Rachuonyo North Sub County HomaBay.

## II. METHODOLOGY

The study employed a descriptive cross-sectional study design among women already diagnosed with PIH and who had been on treatment for a minimum of one month were followed back in time to establish compliance to PIH treatment for that period. From a sampling frame of 1138 derived from three-level four health facilities in the study area, one hundred and seventy-five study respondents were selected to participate in the study. A proportionate sampling technique was used to determine study participants. Critically ill pregnant women, those who were mentally challenged, and those who had a previous history of hypertensive disorders were excluded from the study. A self-administered questionnaire, key informant interview schedule, and focus group discussion guides were used to collect quantitative and qualitative data. Informed signed consent was sought and obtained from study participants before the study was administered. Treatment compliance was measured as a categorical variable coded as; 1. Yes, for having skipped a dose, and 2 as No as not having missed a dose. Quantitative Data collected were entered into SPSS version 20, which was further cleaned to the desired quality before analysis. Qualitative data from focus group discussions were transcribed verbatim into Microsoft Word. Thematic content analysis was used to analyze the qualitative responses. In analysis, various codes were manually coded and grouped to form themes. Frequencies and percentages were used to describe categorical quantitative data. Chi-square test of independence was used to test for association between categorical independent and dependent variables. Associations were considered significant at  $p < 0.05$ . Ethical approval for this study was obtained from Kenyatta University Ethics and Review Committee, and further approvals were obtained from the Kenya National Commission of Science Technology and Innovation (NACOSTI).

## IV RESULTS

### A. Social Demographic Characteristics

Table 1 shows that most study participants (81.7%) aged between 20-30 years and married (80.6%), while 99.6% were Christians. Of the 141 women who were married, 110 were in a monogamous marriage while the others were in a polygamous marriage. Over a third 68(38.9%) had completed primary level of education, and 32.0% were engaged in business activities while 47.1% were earning less than Sh. 5000 per month.

**Table 1:**  
*Socio-demographic Characteristics*

Characteristic	Frequency	Percent (n=175)
<b>Age category (years) &lt;20</b>		
	17	9.7
20-30	143	81.7
30-40	15	8.6
<b>Education</b>		
Primary incomplete	29	16.6
Primary complete	68	38.9
Secondary	64	36.6
Tertiary	14	8.0
<b>Marital status</b>		
Single	30	17.1
Married	141	80.6
Divorced/separated	4	2.3
<b>Religion</b>		
Christian	174	99.4
Muslim	1	0.6
<b>Work</b>		
Housewife	54	30.9
Farming	21	12.0
Businesswoman	56	32.0
Office work	32	18.3
House help	10	5.7
Other*	2	1.1
<b>Monthly earnings (n = 121) &lt;5000</b>		
	57	47.1

5000-10000	33	27.3
10000-20000	16	13.2
>20000	15	12.4

## B. Clinical and Obstetric Characteristics in Current and Previous Pregnancies

Nearly half (47.4%) of the respondents were in their second pregnancy, and that slightly more than half, 54.3%, were diagnosed with PIH between the 4 and 6 months. Further, 69.1% of the respondents had been on treatment for PIH for a period of two months. Among the Multigravidas (n=143), a majority (88.1%) had reported to having a history of PIH in the previous pregnancy. 66.4% had had a previous birth or miscarriage within a period of more than two years before the time of the interview.

**Table 2:**

*Clinical and Obstetric Characteristics in Current and Previous Pregnancies*

Attribute	Frequency	Percent (n=175)
<b>Current pregnancy</b>		
First	32	18.3
Second	83	47.4
Third +	60	34.3
<b>Stage of pregnancy when PIH was diagnosed</b>		
		80 45.7
		95 54.3
<b>Period on PIH medication</b>		
≤3 months		
4-6 months		
2 months	121	69.1
3 or more months	54	30.9
<b>Characteristic of PIH in previous pregnancy among Multigravidas</b>		
	Frequency	Percent (n=143)
<b>Previous birth/miscarriage</b>		
< 1 year		4
1 - 2 years		44
> 2 years	95	66.4
<b>PIH in the previous pregnancy</b>		
Yes	126	88.1
No	17	11.9

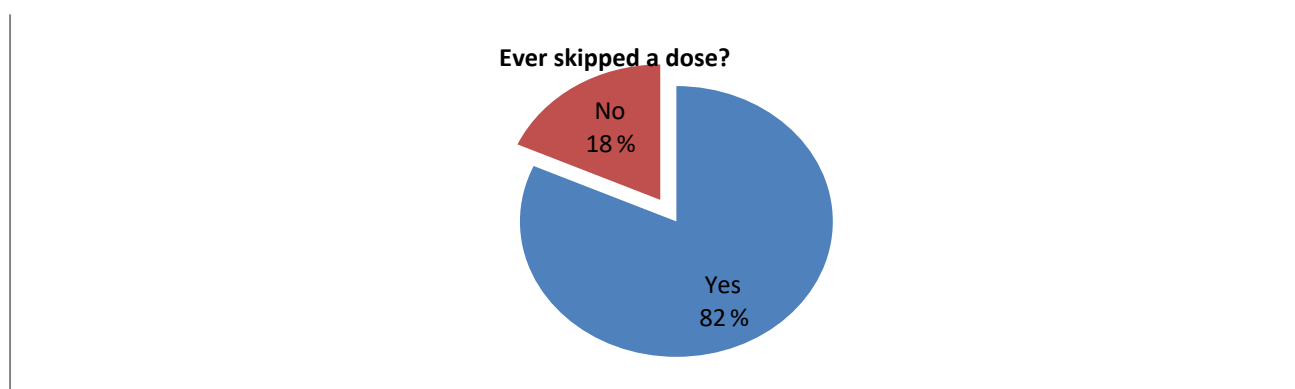
### C. Treatment compliance for PIH among study participants Compliance to Treatment for PIH among Study Participants

#### *Elements of treatment compliance in PIH-pregnant women*

The study dependent variable was PIH treatment compliance. Patients in this study were deemed compliant if they have taken all of the prescribed medications consistently since beginning treatment for PIH. A patient was deemed non-compliant if they admitted to skipping any of the prescribed medications since they began taking PIH medications. The socioeconomic, PIH knowledge, and health system components were the independent variables: Socioeconomic characteristics included the patient's greatest level of education reached, age as of her most recent birthday, marital status, her source of income, and the average monthly income she got from these sources, PIH knowledge was determined by a cumulative score from true-false questions about the perceived importance and effects of PIH, the necessity of seeking treatment for PIH, and the necessity of regular drug use, Health system factors included patients' perceptions of the cost of services and medications, their experiences of finding the medications they needed in medical facilities, the follow-up care provided by health professionals after taking the medications, and the clarity of the medical explanation provided by health professionals on the PIH condition. Figure 1 below illustrates the majority of study participants, 82% (N=143), reported having skipped a dose during treatment for PIH during pregnancy. Only 18% were compliant to treatment doses as prescribed.

**Figure 1:**

*PIH Treatment Compliance*



### D. Reason for Non-Compliance for Treatment

Among those who reported having skipped a dose during treatment (N=143), 36.4% cited adverse effects as a reason for missing treatment; drug shortage was cited by 18.9%, 9.1% forgot while 2.1% of study participants noted the lack of money to either purchase drugs or bus fare to a health facility.

**Table 3:**

*Reasons for Treatment Non-Compliance*

<u>Reasons for skipping a dose</u>	<u>Frequency</u>	<u>Percent (n = 143)</u>
Adverse effects	52	36.4
Was on other drugs	39	27.3
Drugs shortage	27	18.9
Forgot	13	9.1
Travelled	9	6.3
Lack of money for fare/drugs purchase	3	2.1

### **E. Socio-Demographic and Economic Characteristics Influencing Treatment Compliance among Study Participants**

Table 4 shows the socio-demographic and economic characteristics influencing treatment compliance among study participants. Chi-square test of independence association and fisher's exact tests indicate that compliance with PIH was significantly associated with the age of the respondent ( $p= 0.007$ ) and respondents' highest level of education attained ( $p=0.038$ ). There was no association between socioeconomic characteristics and treatment compliance.

**Table 4:**

*Socio-Demographic and Economic Characteristics Influencing Treatment Compliance*

<u>Socio-Demographic/Economic characteristic</u>			
<u>Variables</u>	<u>PIH Treatment Compliance Compliant</u>	<u>Non-compliant</u>	<u>Chi-Square</u>
<b>Age category</b>			
<20	6(35.3%)	11(64.7%)	

20-30	20(14%)	123(86%)	$\chi^2=9.794, df=2, p=0.007$
30-40	6(40%)	9(60%)	

**Age of husband**

20-30	3(23.1%)	10(76.9%)	$\chi^2=.879, df=2, p=0.644$
30-40	9(13%)	60(87%)	
>40	9(15.3%)	50(84.7%)	

**Highest education level attained**

Primary incomplete	9(31%)	20(69%)	$\chi^2=8.396, df=3, p=0.038$
Primary Complete Secondary	6(8.8%) 13(20.3%)	62(91.2%) 51(79.7%)	
Tertiary	4(28.6%)	10(71.4%)	

**Husband education level**

Primary incomplete	2(33.3%)	4(66.7%)	$\chi^2=5.461, df=3, p=0.141$
Primary Complete Secondary	1(9.1%) 11(11.3%)	10(90.9%) 86(88.7%)	
Tertiary	7(25.9%)	20(74.1%)	

**Marital status**

Single	10(33.3%)	20(66.7%)	$\chi^2=5.753, df=2, p=0.056$
Married	21(14.9%)	120(85.1%)	
Divorced/separated	1(25%)	3(75%)	

**Occupation**

Housewife/No working	7(13%)	47(87%)	$\chi^2 = 6.597, df=5, p=0.252$
Farming	4(19%)	17(81%)	
Businesswoman Office work	8(14.3%) 10(31.3%)	48(85.7%) 22(68.8%)	
Other	0(0%)	2(100%)	
House help	3(30%)	7(70%)	

**Husband Occupation**

Not employed	6(11.5%)	46(88.5%)	$\chi^2=1.522, df=4, p=0.823$
Farming	10(16.9%)	49(83.1%)	
Businessman	2(13.3%)	13(86.7%)	
Office work	2(16.7%)	10(83.3%)	
Other	1(33.3%)	2(66.7%)	

**Monthly Earning**

<5000	8(14%)	49(86%)	$\chi^2 = 4.097, df=3, p=0.251$
5000-10000	7(21.2%)	26(78.8%)	
10000-20000	5(31.3%)	11(68.8%)	



>20000 5(33.3%) 10(66.7%)

## F. Level of Knowledge on Treatment Compliance among Women with Pregnancy Induced Hypertension

A series of Knowledge treatment compliance questions were posed to study participants. Tow which they responded to a true or false as illustrated in table 5.

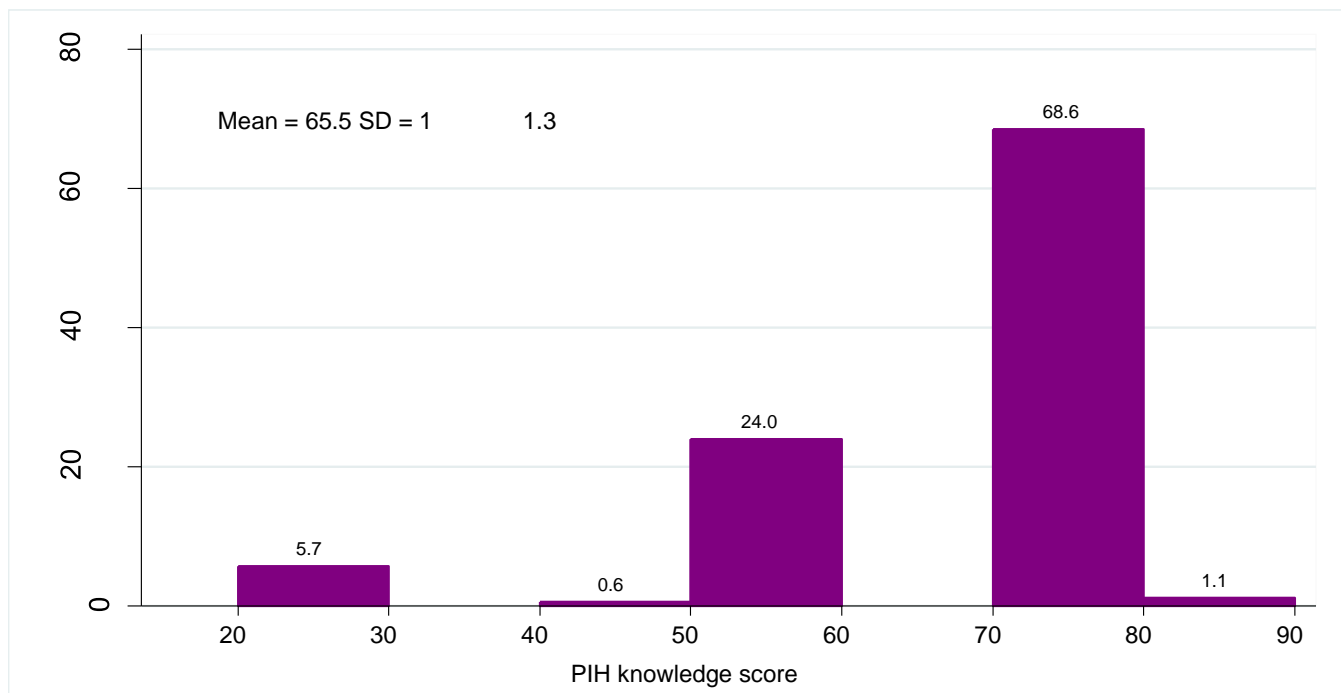
**Table 5:**

*Knowledge on Treatment on Pregnancy Induced Hypertension*

<u>Knowledge Constructs</u>	<u>True</u>	<u>False</u>
Hypertension in pregnancy can cause the death or severe illness of a pregnant mother if it is not managed	124(70.9)	51(29.1)
HIP can cause the death or severe illness of an unborn child if it is not managed	164(93.7)	11(6.3)
HIP occurs to all expectant mothers	163(93.1)	12(6.9)
Drugs for managing HIP should be taken throughout the term of pregnancy	165(94.3)	10(5.7)
For a woman to experience HIP, they must have been hypertensive before the pregnancy	164(93.7)	11(6.3)
HIP conditions heal after delivery or a few weeks after delivery	164(93.7)	11(6.3)
With proper drug compliance, a woman can effectively manage PIH and have a normal pregnancy and delivery	<u>163(93.1)</u>	<u>12(6.9)</u>

From table 5, a knowledge index score was formulated wherein; Respondents were considered knowledgeable if they answered correctly to all statements. A score of 1 was awarded for every statement correctly answered and 0 otherwise. These scores were then summed up and converted to a percentage to indicate the level of Knowledge. Figure 2 shows that the majority (68.6%) of the respondents scored between 70% and 80%, while the average level of Knowledge on PIH was high (mean = 65.5%) although there were high levels of variations (standard deviation).

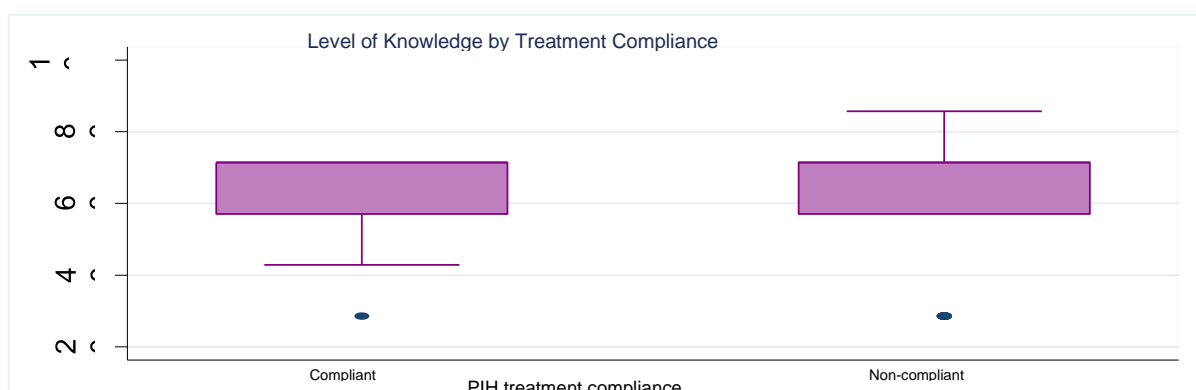
**Figure 2: PIH Knowledge score**



Man-whitney U-test was used to assess the difference in Knowledge among those who were compliant and those who were non-compliant. Findings show that there was no significant difference in Knowledge among the compliant and non-compliant. (Mann Whitney U test:  $U = 2002.5, p = 0.176$ ).

**Figure 4:**

*Level of Knowledge by Treatment Compliance*



## G. Health System Factors Influencing Treatment Compliance among Pregnant Women with PIH in Rachuonyo North Sub-County

### Medical Personnel Related Factors

Chi-square test of association indicated that medical explanation of PIH during diagnosis by health personnel ( $p=0.001$ ), advice on the importance of taking PIH medications ( $p=0.025$ ), and explanation on schedule and timing of taking medications were significantly associated with PIH treatment compliance ( $p=0.024$ ) as shown in table 6

**Table 6:**

	PIH Treatment Compliance		Chi-Square
	Compliant	Non-compliant	
	Count	Count	
<b>Medical personnel explanation of the PIH condition on diagnosis</b>			
Very clearly	6(75%)	2(25%)	$\chi^2 = 18.077$ df=2, $p=0.001$
Somewhat clearly	16(16%)	84(84%)	
Not clear at all	10(14.9%)	57(85.1%)	
<b>Advice on the importance of taking PIH medications</b>			
Very clearly	4(57.1%)	3(42.9%)	$\chi^2 = 7.373$ , df=2, $p=0.025$ *
Somewhat clearly	16(16.5%)	81(83.5%)	
Not clear at all	12(16.9%)	59(83.1%)	
<b>Instructions on the schedule and timing of taking those drugs</b>			
Very clearly	4(57.1%)	3(42.9%)	$\chi^2 = 7.439$ , df=2, $p=0.024$
Somewhat clearly	15(17.4%)	71(82.6%)	
Not clear at all	13(15.9%)	69(84.1%)	

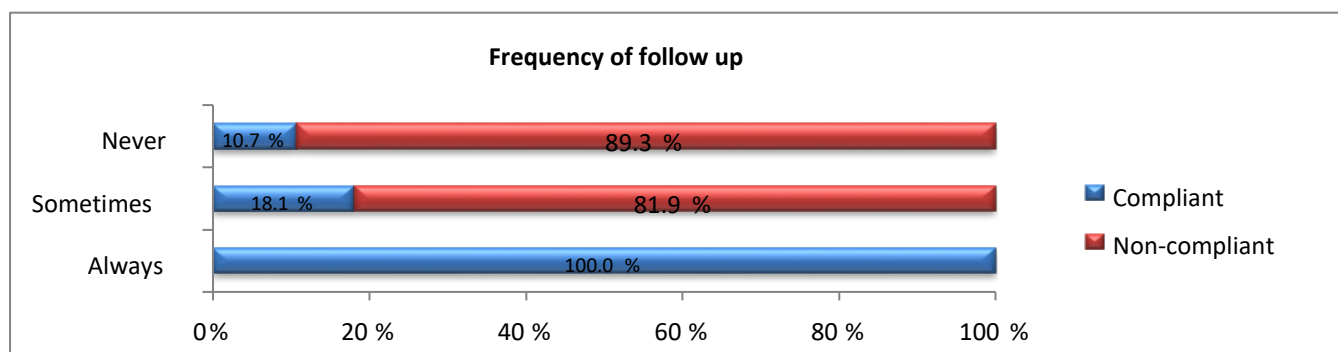
\* Fisher's Exact

### Follow up and PIH Treatment Compliance

Of the 3(1.7%) respondents who on return visits were always followed up to ask if they were taking PIH drugs consistently, all of them were compliant with PIH treatment. Of the 144(82.3%) who were followed up sometimes if they were taking PIH drugs consistently, only 18.1% of them were compliant with PIH treatment, while of the 28(16.0%) who were never followed up to ask if they were taking PIH drugs consistently only 10.7% were compliant with

PIH treatment as shown. Chi-square test of association (Fisher's Exact) indicated that frequency of follow-up was significantly associated with PIH treatment compliance ( $\chi^2 = 4.486$ ,  $df = 2$ ,  $p = 0.001$ ).

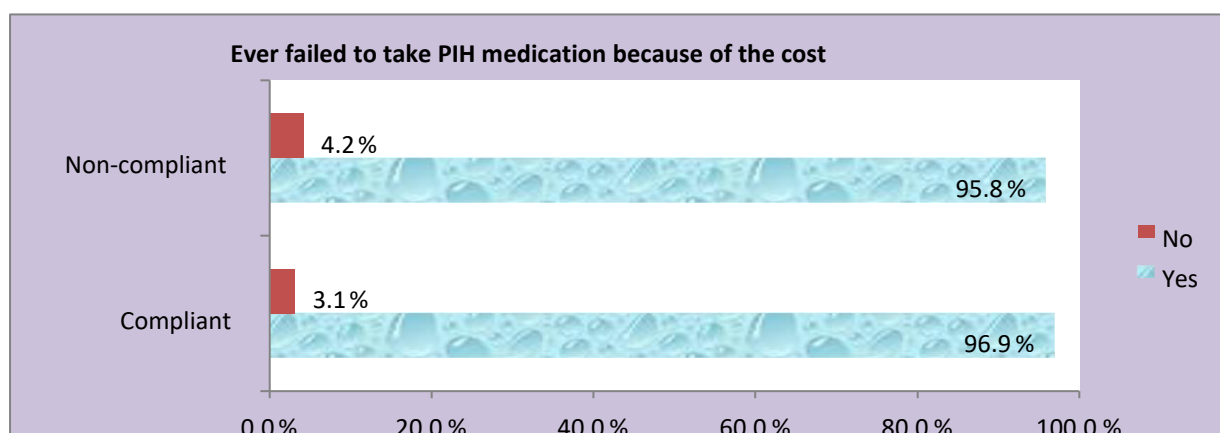
**Figure 5:**  
*Frequency of Follow-up*



**Affordability and PIH Treatment Compliance**

Figure 4 illustrates that 96% (n=168) had failed to take PIH medication because the drugs' cost was not affordable, while 7(4.0%) had not failed to take PIH medication because of cost-related issues. Of the 32 treatment compliant respondents, 31(96.9%) failed to take PIH medication because the drugs' costs were not affordable. There was no significant association between PIH drugs affordability and PIH treatment compliance ( $\chi^2 = .078$ ,  $df = 1$ ,  $p = .780$ ).

**Figure 6:**  
*Proportion of Respondents who Ever Failed to Take PIH Medication Due to Cost*

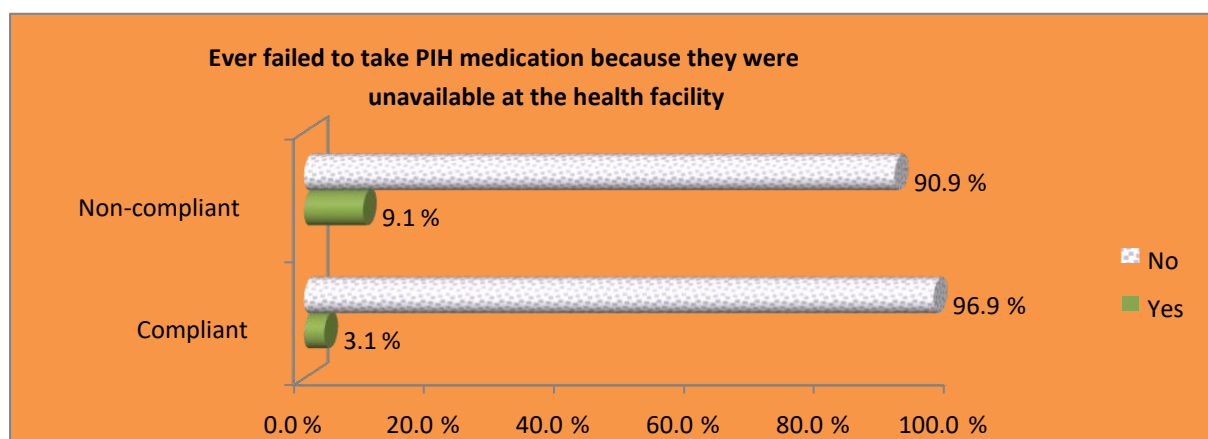


### Availability of Treatment at Health Facility

A paltry 14(8.0%) respondents had failed to take up medication because they were not available at the health facility. Of the 143 respondents who were not treatment compliant, only 13(9.9%) failed to take PIH medication because the cost of the drug was not available at health facilities, as shown in Figure 4.9. There was no significant association between PIH drugs affordability and PIH treatment compliance ( $\chi^2 = 1.265, df = 1, p = .261$ ).

**Figure 7:**

*Proportion of Study Participants Whoever Failed to Take PIH Medication Because they were Unavailable at the Health Facility*



## V: DISCUSSION

### Level of Treatment Compliance to PIH

The main objective of this study was to assess the level of treatment compliance with women diagnosed with PIH. Analysis shows that compliance to treatment among women with PIH was low (18.3%). This was also lower compared to the levels reported in Sunderland (76.5%) (Khan, Shah, & Hameed, 2014), Egypt (25.9%) (Youssef & Moubarak, 2002), and Ethiopia (64.6 %) (Ambaw et al., 2012). The difference in compliance rate could be due to the cost of medical care and drugs, better care services, and patient awareness about medication adherence which is different in Kenya as compared to those countries.

### **Socio-demographic Factors Affecting Treatment Compliance among Women with PIH**

In this study, level of education and age were found to be significantly associated with treatment compliance. Type of marital status, income level, and occupation were essential factors in treatment compliance though they did not meet the statistical threshold for significance. This finding concurred with another study done in Zimbabwe that showed significant associations existed between treatment compliance and age and compliance and marital status with those who were married adhering more (Wariva et al., 2014). In a study done in Saudi Arabia, age was shown to have a significant association with treatment compliance (Al-Hewiti, 2014) and was incongruent with the findings of this current study.

### **Level of Knowledge on PIH and Treatment Compliance**

In this study, the level of Knowledge on treatment compliance was generally high. With 68.6% of the respondents scoring more than 70% in a set of true/false PIH questions. For instance, in Zimbabwe, a study among PIH patients showed a deficiency of Knowledge on treatment compliance (Wariva et al., 2014). In a study among pregnant women attending ANC in Nigeria, results indicate that most of the pregnant women were aware, but 80% of them only visited the hospital on noticing swollen legs, while 60% believed the swelling was a result of being bewitched (Oyira et al., 2009)

### **Health System Factors Affecting Compliance among Women with PIH**

In this study, the five health system factors studied included: affordability of care and drugs, availability of drugs, PIH medical explanation during diagnosis, advice on the importance of taking PIH medications, explanation on schedule, and timing of taking pills and follow-up by the health workers. Although not significant predictors of PIH treatment compliance, it was found out that explanation of PIH during diagnosis, advice on the importance of taking PIH medications, explanation on schedule and timing of taking medications frequency of follow up were significantly associated with PIH treatment compliance. This finding concurred with a similar study by Rahmathulla et al. (2014), which showed that the patients who had received extensive counselling from a pharmacist regarding disease management showed a more significant improvement in medication adherence.

## Recommendations

- i. Come up with strategies for patient education on PIH and its treatment to effectively improve medication compliance as it has been that their levels were just above average.
- ii. Education is a predictor of PIH treatment compliance; there is a need to ensure basic education for all girls as non-completion of primary schools increases non-compliance.
- iii. There is a need for medical personnel to enhance their practice on these matters, especially regarding PIH.
- iv. Further research can be done on the influence of husband or significant other support on PIH treatment compliance and replication of this study in a broader geographical scope. There is also a need to explore further the influence of cultural beliefs in health-seeking behavior among PIH patients.

## Conflict of interest

Authors declare no conflict of interest.

## Ethical approval

This study was approved by Kenyatta University Ethics Review Committee *PKU/306/1282*.

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