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Predictors of adherence to Isoniazid Preventive Therapy among people living with HIV: A cross-sectional study in Kisumu Central, Western Kenya

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ABSTRACT: *Background:* Despite scaling up Isoniazid preventive therapy implementation in areas with a high prevalence of HIV and latent tuberculosis infection >30%, there is a paucity of data assessing adherence which is pivotal to END TB control and elimination. We sought to determine the adherence level and its correlates among people living with HIV initiated on IPT in selected hospitals in Kisumu Central, Kisumu County.
Methods: A facility-based cross-sectional study was conducted at Jaramogi Oginga Teaching and Referral Hospital, Kisumu County Hospital and Lumumba Sub-County Hospital between June and July 2018. A random sample of PLHIVs aged ≥18 years, initiated on IPT between 2016 and 2018 were interviewed. Self-reported method was used to ascertain adherence. Data was collected using Commcare and analysed with STATA 14.0. A generalized linear regression model was used to generate the adjusted prevalence ratios and 95% confidence intervals.
Results: Of 462 respondents, 282(61%) were females. The mean age of respondents was 37.9 [±10.4, SD]. Forty percent (40% [n=185; 95 C.I = (35.6%-44.6%) adhered to treatment. Respondents who had knowledge of latent tuberculosis infection were more likely to adhere compared to those who had no knowledge [aPR=1.6; 95%CI= (1.16-2.2), P=0.004]. Respondents who experienced IPT stock-outs were less likely to adhere as compared to those who experienced no stock-outs [aPR=0.15; 95%CI= (0.02-0.93); P=0.042].
Conclusion: The overall adherence level is sub-optimal against a set threshold (≥ 80%). Knowledge and IPT stock-outs were associated with adherence. Sustained awareness campaigns and uninterrupted supply of IPT would optimize on adherence.

KEYWORDS: Adherence, Treatment, latent, tuberculosis, Infection.

1 INTRODUCTION

Tuberculosis has re-emerged as a major threat to global public health and ranks the second leading cause of mortality among infectious diseases worldwide [1]. The epidemic is largely fueled by co-infection with HIV, through a bi-directional relationship where HIV drives a majority of TB associated morbidity and mortality, while TB is the leading cause of mortality among PLHIVs [2],[3]. Moreover, HIV is the strongest predictor of progression among those with latent or new Mycobacterium tuberculosis infection to active TB disease4. The incidence is increased in countries with high HIV prevalence5. Kenya is among the 10 out of 22 highly burdened countries with TB world over [6], with a prevalence of 558 per 100,000 population [7]. Kisumu County is considered HIV/TB endemic region with HIV prevalence of 19.9% and TB case notification rate of 379 per 100,000 population [8], [9].

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People living with HIV (PLHIV) are 20-37 times at risk of reactivation of latent TB infection to active TB in their lifetime [10]. Approximately, two billion people (23%) are infected with latent tuberculosis infection (LTBI) worldwide, forming an enormous reservoir for potential TB cases and a barrier to global TB elimination and control [11], [12]. Exposure to *Mycobacterium tuberculosis* may result in latent tuberculosis infection, a state in which the host immune system controls replication of the bacillus thereby hindering progression to TB disease [13],[14]. The pathway of progression from LTBI to active TB follows immune suppression, reactivation, and exposure to new infection or reinfection with Mycobacterium tuberculosis [13], [15], [17].

Initiation of PLHIVs on Antiretroviral therapy (ART) confers a protective effect against incidences of TB and significantly reduces TB/HIV associated mortality [10]. However, ART as a standalone intervention is inadequate in reducing the risk of TB among HIV infected individuals. The WHO collective Implementation of the three I's TB specific interventions including but not limited to Infection prevention (IPC), Intensified case finding (ICF) and Isoniazid preventive therapy (IPT) is recommended to further reduce the risk of TB in HIV-infected individuals [18],[19]. Intensified Case Finding (ICF) clinical algorithm enables initiation of Isoniazid Preventive Therapy (IPT) to latent TB HIV infected persons in order to avert disease progression and reduce TB/HIV associated morbidity and mortalities among PLHIV [20].

In 2015, the Kenya National Tuberculosis Leprosy and Lung Disease Program (NTLD-P) with assistance from the US government President's Emergency Plan For AIDS Relief (PEPFAR) support initiative, piloted the implementation of IPT in predetermined pilot health facilities in all HIV hyper-endemic regions [21]. Three hundred (300) mg of Isoniazid (INH) and 25 mg of pyridoxine was administered in a self-fashioned to all latent TB HIV infected eligible adults on scheduled monthly visits at the respective comprehensive care clinics. Documented evidence has shown that IPT reduces the risk of individuals from progressing to active TB by 33% and 56% if given for 36 months [21], [22]. Concomitant use of IPT and ART have a synergetic effect in averting incident TB among HIV positive patients [22]. Different studies on IPT provision have reported variable rates of acceptance and completion with a significant proportion of PLHIV complying with treatment [23]. In addition, the previous meta-analysis revealed sub-optimal rates of initiation and completion varied across different populations [24]. Treatment completion rates have ranged from 19% to 82% for both 9 and 6 months regimens respectively [25], [29].

Despite scaling up of IPT implementation in areas with a high prevalence of HIV and LTBI (> 30%) as per WHO recommendation [10], [30], Kenya targeted 90% countrywide roll-out of IPT for PLHIVs by December 2016 [31], [32]. However, despite this ambitious rollout of IPT for programmatic implementation, there is a paucity of data exploring the levels of adherence and associated factors among PLHIVs initiated on IPT in these settings. Determination of uptake, adherence levels, and surveillance for Isoniazid mono-resistance is recommended in order to realize the full risk reduction benefit among PLHIV [33], [34]. Monitoring of IPT adherence strengthens program implementation by identification of probable gaps and advocacy for the adoption of appropriate adherence strategies, which enables improvement of the health outcomes among most at-risk groups. In this study, we sought to determine the adherence level and associated factors among PLHIV initiated on IPT in selected hospitals in Kisumu Central, Kisumu County.

2 MATERIAL AND METHODS

2.1 ETHICAL CONSIDERATION

We obtained the ethical approval from Jaramogi Oginga Odinga Teaching and Referral Hospital's Scientific Steering and Ethics Review Committee [Ref; ERC/IB/Vol., 1/451]. Administrative approval was obtained from the County Government of Kisumu, Ministry of Health, through the Director of Health Services. Informed consent was administered orally to all eligible respondent explaining the purpose of the study. Respondents were informed of voluntary participation and room for withdrawal at any stage of the study or interview. In addition, the respondent's confidentiality was guaranteed through non-disclosure of individual identifiers or recording of real names.

2.2 STUDY SETTING

A facility-based cross-sectional study was conducted in Kisumu Central, Kisumu County at Jaramogi Oginga Teaching and Referral Hospital, Kisumu County Hospital and Lumumba Sub-County Hospital between June and July 2018. Kisumu County was among the national pre-determined TB/HIV endemic regions where IPT implementation was started. The-selected hospitals are among the high tier hospitals offering comprehensive TB/HIV integrated services to a larger population of PLHIVs that were targeted for IPT roll out in 2015.

2.3 INCLUSION AND EXCLUSION CRITERIA

We targeted PLHIVs scheduled for daily care at the respective hospitals. PLHIVs aged ≥18 years, referred for IPT, declined IPT initiation, initiated on IPT between January 2016 through January 2018, reported full 6 months completion of IPT, consented orally and willing to be interviewed were enrolled. In addition, those who were discontinued from IPT due to development of symptoms suggestive of active TB while on treatment or had adverse drug reactions were also enrolled in the study. PLHIVs aged ≤ 18 years, who IPT was not indicated, on-going with IPT from July 2018, initiated on IPT from 2015 and below and declined consent or were unwilling to be interviewed, were excluded from the study.

2.4 SAMPLE SIZE DETERMINATION

Cochran formula $n=Z^2$ PQ÷e2 for cross-sectional studies was used in calculating the sample size [35], based on the assumption of initial adherence rate of 33% [36], 5% level of precision, 95% confidence interval and 47.5% non-response rate. The sample size was estimated and corrected for small population assuming 4000 population. The final sample size was 462.

2.5 SAMPLING PROCEDURE

Purposive sampling was used in the selection of the three hospitals followed by probability proportionate to the size distribution to determine the number of PLHIVs to be enrolled per hospital. Simple random sampling was used in the recruitment of PLHIV at the selected hospitals. The number of respondents enrolled in the study was based on the average number of PLHIVs scheduled for daily visits, and this was used to distribute the calculated sample size proportionately among the hospitals during enrolment. Jaramogi Oginga Odinga Teaching and Referral Hospital enrolled 177, Kisumu County Hospital 148 and Lumumba Sub-County Hospital 136 PLHIVs respectively.

2.6 DATA COLLECTION

Commcare was used to administer a structured questionnaire to the respondents. The questionnaire collected participants socio-demographic, patient-related and health systems data. Self-reported adherence was the outcome variable and it was measured against a cut-off of ≥ 80% set threshold, which is equivalent to the successful completion of IPT for six months. Commcare automatically generated completion dates upon keying in the initiation date that was highlighted by the primary clinician. Besides; the primary clinicians screened PLHIVs and reviewed the eligibility criteria for possible enrolment. All eligible respondents were highlighted in the clinic review forms and referred to the research assistants for consenting. Ten to fifteen minutes of interviews were conducted before directing the respondents for ART refills at the pharmacy.

2.7 DATA QUALITY CONTROL

The research assistants were trained on Commcare and data integrity. Data validation checks with seamless skip logic patterns were incorporated during programming of the questionnaire. The questionnaires were pre-tested and tested among 46 respondents 10% of 462 in a different health facility for a period of two weeks targeting at least five PLHIVs per day. Common data errors were identified and necessary corrections made. The questionnaire was reprogrammed using Enketo software. Cronbach's alpha test was computed in STATA and α reliability coefficient score of 0.80 obtained. This was used to validate the questionnaire. We piloted the study in the three hospitals to at least five eligible respondents on a daily basis for two-weeks. The primary clinician reviewed all PLHIVs scheduled daily for care for their eligibility. The principle investigator shuttled in the three hospitals to ensure that all eligible respondents were highlighted in the clinic review forms before handing them over to the research assistants for possible enrolment. Data from the pilot study were excluded from the final analysis.

2.8 DATA MANAGEMENT AND ANALYSIS

Data were synchronized to Commcare for storage and assessed daily for completeness and integrity. Raw data were exported in excel, cleaned, validated and imported to STATA version 14.0, Stata Corp, Texas, the USA for analysis. Frequencies and proportions were calculated for categorical variables. Chi-square ($\chi 2$) was used to assess the association among categorical variables. A Generalized linear model customized with a log link function with Poisson distribution was used to compare the adjusted prevalence ratios since our outcome of interest was >10% [37]. Stepwise selection criteria were used to assess for interactions and select variables significant at bivariate $P<0.20$ then fitted to the final model. The statistical level of significance was set at $P\leq0.05$.

3 RESULTS

3.1 SOCIODEMOGRAPHIC CHARACTERISTICS

The mean age of the respondents was 37.9 (±10.4, SD). Out of 462 respondents, 282 (61%) were females. Three hundred and twenty-eight (71%) were married. Two hundred and six (44.6%) had a secondary level of education. Majority of the respondents, 244(52.8%) were self-employed. Two hundred and four (44.2%) had income levels of between Ksh 0-5000 with 452 (97.8%) predominantly Christians as shown in [Table 1].

Table 1. Sociodemographic characteristics of the study Participants in Kisumu Central

Social-demographic factors	N (%)	Adherence n (%)	PR (95%CI)	P-value
Adherence Level	462	185	40 (35.6-44.6)	
Age in Years Mean Age (37.9± 10.4 SD)				
18 - 29	108(23.4)	57(52.8)	2.08(1.32-3.25)	0.001
30 - 39	166(35.9)	64(38.6)	1.49(0.94-2.35)	0.083
40 - 49	121(26.2)	47(38.8)	1.49(0.93-2.39)	0.092
>50	67(14.5)	17(25.4)	1.0	1.0
Sex				
Male	180(39.0)	77(42.8)	1.11(0.88-1.39)	0.357
Female	282(61.0)	108(38.3)	1.0	1.0
Marital status				
Single	75(16.2)	38(50.7)	2.53(1.02-6.27)	0.044
Married	328(71.0)	132(40.2)	2.01(0.82-4.88)	0.122
Divorced	20(4.3)	5(25.0)	1.0	1.0
Widowed	39(8.4)	10(25.6)	1.15(0.40-3.29)	0.789
Level Of Education				
None(illiterate)	8(1.7)	4(50.0)	1.71(0.81-3.57)	0.154
Primary	147(31.8)	43(29.3)	1.0	1.0
Secondary	206(44.6)	91(44.2)	1.49(1.11-2.00)	0.008
Tertiary	101(21.9)	47(46.5)	1.55(1.11-2.16)	0.009
Occupational Status				
Unemployed	87(18.8)	38(43.7)	1.0	1.0
Self-employed	244(52.8)	95(38.9)	0.88(0.66-1.17)	0.391
Formal Employment	131(28.4)	52(39.7)	0.89(0.64-1.22)	0.483
Income Levels(Ksh)				
0-5000	204(44.2)	65(31.9)	1.0	1.0
5000-10,000	74(16.0)	30(40.5)	1.27(0.90-1.79)	0.167
10,000-15,000	69(14.9)	30(43.5)	1.36(0.97-1.91)	0.070
>15,000	115(24.9)	60(52.2)	1.58(1.21-2.07)	0.001
Religion				
Christian	452(97.8)	179(39.6)	1.0	1.0
Muslim	10(2.2)	6(60.0)	1.53(0.91-2.57)	0.107

Legend, Footnotes *CI, Confidence Intervals; SD, Standard Deviation; PR, Prevalence Ratio; Reference category=1.0*

3.2 ADHERENCE LEVEL AND ASSOCIATED FACTORS

Out of 462 respondents, 40% [n=185; 95% C.I (35.6%-44.6%)] adhered to six months IPT medication successfully as shown in [Table 1].

3.3 PATIENT-RELATED FACTORS

Majority of the respondents 394 (85.2%) disclosed their IPT consumption status to either family or friends. Most respondents 192(91.87%) perceived LTBI as infectious. Three hundred and ninety-three (85.1 %) respondents had no known TB contact with 253 (54.8%) having no awareness of latent TB infection. Most respondents 413(89.4%) did not partake to

alcohol, drugs and related substances. Four hundred and fifty-nine (99.3%) were not stigmatized and out of 282 females, 275(97.5%) were not pregnant. In bivariate analysis, respondents who had awareness on LTBI were more likely to adhere to IPT medication compared to those who had no awareness [PR=1.95; 95% CI (1.54-2.47); P=0.001].

3.4 HEALTH SYSTEM FACTORS

One hundred and eighty-three (61%) respondents had viral load results between ranges 0-50 ml/copies. One hundred and ninety-nine (43.2%) respondents lived 0-5Kilometres in proximity to respective hospitals. Majority of the respondents 344(82.3%) experienced no side effects and 451(97.6%) reported no stock-outs during the course of treatment. Four hundred and forty-four (96.1%) were counselled on the rationale behind IPT initiation with 458(99.1%) of respondents acknowledging a good provider attitude during the course of therapy. In bivariate analysis, respondents who experienced IPT stock-outs were less likely to adhere to IPT medication as compared to those who experienced no stock-outs [PR=0.23; 95% CI (0.03-1.46); P< 0.119]. Respondents who covered a distance of 5-10 kilometers [PR=0.56; 95% CI (0.42-0.74); P<0.001] and 11-15kilometres [PR=0.69; 95% CI (0.48-0.99); P<0.0047] were less likely to adhere to IPT medication compared to those who covered a distance of > 30 kilometers to the health facilities.

Table 2. Prevalence ratios of factors associated with adherence to Isoniazid Preventive Therapy among PLHIV in selected hospitals in Kisumu Central, Kisumu County

Variables			Bivariate Analysis		Multivariate Analysis	
	N (%)	Adherence n (%)	PR (95% CI)	p value[a]	aPR (95% CI)	P value[b]
Age in Years						
18 - 29	108(23.4)	57(52.8)	2.08(1.32-3.25)	0.001	1.38(0.81-2.35)	0.236
30 - 39	166(35.9)	64(38.6)	1.49(0.94-2.35)	0.083	1.29(0.79-2.1)	0.302
40 - 49	121(26.2)	47(38.8)	1.49(0.93-2.39)	0.092	1.35(0.81-2.23)	0.237
>50	67(14.5)	17(25.4)	1.0	1.0	1.0	1.0
Marital status						
Single	75(16.2)	38(50.7)	2.53(1.02-6.27)	0.044	1.54(0.58-4.09)	0.38
Married	328(71.0)	132(40.2)	2.01(0.82-4.88)	0.122	1.4(0.56-3.51)	0.468
Divorced	20(4.3)	5(25.0)	1.0	1.0	1.0	1.0
Widowed	39(8.4)	10(25.6)	1.15(0.40-3.29)	0.789	1.31(0.45-3.75)	0.61
Level Of Education						
illiterate	8(1.7)	4(50.0)	1.71(0.81-3.57)	0.154	1.98(0.41-9.53)	0.393
Primary	147(31.8)	43(29.3)	1.0	1.0	1.0	1.0
Secondary	206(44.6)	91(44.2)	1.49(1.11-2.00)	0.008	1.13(0.8-1.6)	0.463
Tertiary	101(21.9)	47(46.5)	1.55(1.11-2.16)	0.009	1.07(0.75-1.52)	0.694
Aware of Latent TB						
Yes	209(45.2)	113(54.0)	1.95(1.54-2.47)	<0.001	1.6(1.16-2.2)	0.004
No	253(54.8)	70(27.6)	1.0	1.0	1.0	1.0
Viral Load Results						
0-50ml/copies	183(61.0)	101(55.2)	1.14(0.99-2.03)	0.056	1.23(0.87-1.73)	0.226
51-999ml/copies	63(21.0)	20(31.8)	0.81(0.49-1.33)	0.420	0.93(0.58-1.49)	0.785
≥1000ml/copies	54(18.0)	21(38.8)	1.0	1.0	1.0	1.0
Disclosure						
Yes	324(70.1)	142(43.8)	1.49(0.99-2.22)	0.051	1.1(0.73-1.66)	0.635
No	138(29.8)	41(29.7)	1.0	1.0	1.0	1.0
Distance						
5-10Kms	199(43.2)	58(29.2)	0.56(0.42-0.74)	<0.001	0.71(0.48-1.03)	0.077
11-15Kms	71(15.4)	25(35.2)	0.69(0.48-0.99)	0.047	0.85(0.58-1.24)	0.413
16-20Kms	71(15.4)	39(54.9)	1.08(0.82-1.42)	0.580	1.17(0.94-1.47)	0.154
≥30Kms	120(26.0)	62(51.7)	1.0	1.0	1.0	1.0
Stock Outs						
Yes	11(2.4)	1(9.1)	0.23(0.03-1.46)	0.119	0.15(0.02-0.93)	0.042
No	451(97.6)	184(40.8)	1.0	1.0	1.0	1.0

Legend, Footnotes: *aPR, adjusted Prevalence Ratios; CI, Confidence Intervals; Reference category, =1.0; P-value [a, b], statistical significance determined by a generalized linear regression model.*

In the multivariate generalized linear regression model, respondents who had knowledge of LTBI were more likely to adhere to IPT compared to those who had no knowledge of LTBI [aPR=1.6; 95% CI (1.16-2.2); P=0.004]. Respondents who experienced IPT stock-outs were less likely to adhere compared to those who experienced no stock-outs [aPR=0.15; 95% CI (0.02-0.93); P=0.042] as shown in [Table 2].

4 DISCUSSION

Determination of adherence levels and its correlates is integral in informing public health policy, practice, interventions and investments. Studies have shown IPT adherence levels to range from 19% to 90% for both 6 and 9 months regimen [25], [30]. Furthermore, initiation and completion rates vary greatly within and across different populations [24]. In this current study, we established an adherence level of 40% [n=185; 95 C.I (35.6%-44.6%)] among PLHIV initiated on IPT for six months, against a cut off >80% constituted by International Union against Tuberculosis (I.U.A.T) in determining compliance to IPT [38]. Our adherence level (40%) was higher than 33.6% adherence rate established in Uganda [36]. The variation can be attributed to the adoption of a cross-sectional survey as opposed to retrospective cohort study design and use of secondary data in the Ugandan study that more often fail to examine exhaustively all possible covariates of interest. In addition, we used a short regimen of IPT (6months course) to ascertain adherence compared to a long course regimen (9 months of IPT) scenario that might have led to the underestimation of adherence in Uganda.

The level of adherence in this current study was lower compared to results from studies conducted in New York and South Africa that reported adherence rates of 45% and 47.1% respectively [39], [40]. We used primary data for the survey while the New York study adopted a registry that reported some inadequacies. The registry data was deficient in capturing essential information among sub-groups of the homeless population and drug abusers. Exclusion of these variables plus perception on risk on LTBI from the analysis might have overestimated compliance. Moreover, the two studies incorporated directly observed preventive therapy (DOPT), a supportive intervention known to reinforce compliance.

Our level of adherence was much lower than 90.3% and 87% rates reported in Ethiopia and Tanzania respectively [33], [41]. Variation in time points of assessing adherence could be attributed to the high levels of adherence reported in Ethiopia. For instance, in our study, we used six months period as to ascertain adherence level while in Ethiopia, adherence was monitored for seven days without a standard questionnaire33. Consistent with a study conducted in South Africa [40], both studies relied solely on self-reports without corroboration with external approaches, a situation that might have underestimated or overestimated adherence level in the two studies. However, adherence levels of 84.5% and 79.7 %, and 81.8% and 73.9% were reported through self-reports and pill counts among PLHIVs with positive tuberculin skin test (TST) and non-tuberculin skin test in Thailand [42]. Differentials in practices including but not limited to TST screening and transport reimbursement, have been demonstrated to augment adherence especially in research settings, a feat that is hardly replicated in routine clinical care [41],[43]. The difference in adherence rates among these studies could be explained further by the lack of a gold standard in determining adherence. Myriad methods unlimited to the number of clinic visits, medication events monitoring (MEMS), self-reports, pill collection, pill counts and urine metabolite (Arkansas) have been used to assess adherence with each yielding different results [44]. It is therefore imperative to use a combination of the above methods to accurately measure adherence and yield plausible results [45].

Notably, respondents who had knowledge of LTBI were more likely to adhere to IPT compared to those without knowledge on LTBI. These findings were consistent with studies that revealed inadequate knowledge, awareness and information pertaining to latent tuberculosis infection as an impediment to adherence [25], [46]. The respondent's knowledge was gauged using a multi-nominal Likert scale to assess the level of awareness, opinions on the severity of the risk and general understanding of variant forms of tuberculosis disease. Knowledge informs decision-making, health-seeking behaviour and an overall improvement in perception, risk appraisal and compliance with therapy33. Conversely, inadequate knowledge propagates low-risk appraisal leading to poor health-seeking behaviour and health outcomes. In order to optimize on adherence, all PLHIVs screened for LTBI need to be furnished with necessary information on the treatment of latent tuberculosis infection and its rationale. This can be achieved through advocacy, communication and social mobilization, adoption of educational programs that modify therapeutic behaviour through enhanced adherence counselling or dissemination of information, education and communication (IEC) materials to improve on cognitive barriers that impede adherence [33], [40], [43], [47]. In addition, nuanced approaches that integrate both structural and behavioural intervention, with ancillary methods mainly stepped care model, supplemented with directly observed preventive therapy (DOPT) and cognitive behavioural therapy (CBT) should be incorporated in TB/HIV clinics in order to bridge the gap in knowledge and optimize on adherence. These interventions have been widely used to boost adherence in other novel biomedical interventions [48], [49].

We established that respondents who missed doses of Isoniazid were less likely to adhere to therapy compared to those who did not. Consistent with these findings, operational barriers characterized by the erratic and intermittent supply of IPT

have been demonstrated to promote poor treatment outcomes in studies conducted in Ethiopia and Nairobi Kenya [50], [51]. However, in this current study, we did not conduct a key informant interview that might have solidified this finding. Moreover, a previous study revealed that shortage of IPT and pyridoxine prompted health care providers to devise mechanisms of dispensing pediatric IPT doses to adults that eventually led to bill burden and overall noncompliance [52]. This can be attributed to lack of clarity in the procurement processes, support or commitment among policymakers and program implementers. Therefore, a high level of engagement among stakeholders working with TB/HIV programs aimed at continuous resource mobilization, procurement and monitoring should be reinforced in order to ensure a continuous uninterrupted supply of IPT for successful implementation.

Our study had the following limitations. Adoption of the self-reported method as a way of establishing adherence was not corroborated with other approaches like medication events monitoring (MEMS), pill counts, refill records or pharmacy claims. In addition, in self-reported method, respondents are susceptible to recall and social desirability biases and as a result; the level of adherence could be overestimated or underestimated at the same time. These limitations notwithstanding, self-reports offer advantages of low cost, minimal patient and clinician burden, flexible design that suits individual language capabilities, and ease of data collection in resource-constrained settings [53]. The questionnaire used in data collection incorporated the requisite elements of the Morisky, Green and Levine adherence scale (MGLS), and Tuberculosis Medication Adherence Scale (TBMAS). These approaches have been widely used to ascertain adherence in cases of self–reported medication. Nonetheless, the analysis was not stratified per health facility, as this would elicit adherence dynamics in each hospital. We assessed IPT adherence for six months as compared to other studies and since there are limited studies done in these settings, findings from this study can be extrapolated in other programmatic areas in Kisumu County and be used as a baseline for program strengthening and practice.

5 CONCLUSION

The level of adherence to IPT among PLHIV is sub-optimal despite scale-up of TB/HIV collaborative activities. Knowledge of latent tuberculosis infection and IPT stock-outs were significantly associated with adherence. Adoption or tailoring of ancillary approaches including but not limited to advocacy, communication and social mobilization, enhanced adherence counselling and dissemination of information, education and communication materials could optimize adherence. In addition, relevant stakeholders need to ensure uninterrupted supply of IPT and related commodities in order to avoid shortages. Future studies need to examine the underlying factors associated with high levels of non-adherence among PLHIV initiated on IPT in these settings.

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