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Factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya: A qualitative study

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Factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya: A qualitative study

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Research question

What are the factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya?

ABSTRACT

Objective

Despite being globally recommended as an effective intervention in tuberculosis (TB) prevention among people living with HIV (PLHIV), Isoniazid preventive therapy (IPT) implementation remains sub-optimal, especially in sub-Saharan Africa. This study explored the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya, a high HIV/TB burden country.

Design

A qualitative study was conducted using in-depth interviews with health care providers in selected HIV clinics. All conversations were audio-recorded, transcribed verbatim and thematic content analysis done.

Setting

The study was conducted in the HIV clinics of three purposefully selected public health care facilities in Nairobi County, Kenya between January 2017 and April 2017.

Participants

Eighteen purposefully selected health care providers (clinicians, nurses, pharmacists and counsellors) working in the HIV clinics participated in the study.

Results

IPT was not fully accepted by health care providers in this context. Provider acceptability was influenced by factors at different levels of health service provision. These included factors related to the organizational context, provider training on IPT and their percerption on its efficacy, length and clarity of IPT guidelines and standard operation procedures, and structural level (policy, physical and working environment) factors. Among them, structural, provider, and patient-related factors stood out as key influencers of IPT acceptability among the health care providers.

Conclusion

Even though Kenya has adopted the WHO recommended guidelines on HIV/TB management through IPT, a general low level of acceptability of this therapy among health care providers is a barrier to its successful implementation. To overcome this barrier, policy makers and programme managers should address the acceptability among providers. Ensuring optimal acceptability of IPT among health care providers will require expanded depth of engagement

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with both providers and patients and on-the-job design specific actions to support providers in implementation.

Key Words: Acceptability, Isoniazid, Comprehensive care centre, health care provider, HIV/TB

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Article Summary:

Strengths and Limitations of this study

- To our knowledge, this is among the first qualitative studies exploring factors influencing the acceptability of Isoniazid preventive therapy among health care providers in the context of HIV clinics providing integrated HIV and TB services.
- The inclusion of both clinical and non-clinical health care providers in the study enabled the collection of information at different levels and cadres of health service provision thereby enhancing the breadth and validity of the information obtained.
- The adaptation of existing theory and literature to guide the study enabled the collection of exhaustive context-specific information at different levels of the health system.
- Purposive selection of the health facilities included in the study may limit the generalizability of our findings beyond the study context though the conclusions and recommendations are useful and applicable in other contexts.

INTRODUCTION

Tuberculosis (TB) and (Human Immunodeficiency Virus) HIV co-infection remain a major public health threat and challenge to health systems in many Low and Middle-income Countries (LMICs). The threat is more pronounced for people living with HIV (PLHIV). The World Health Organization (WHO) estimates that PLHIV account for 1.2 million (11%) of the 10.4 million reported incidence of TB in 2015 (1). PLHIV are about 20 to 30 times more likely to develop active TB compared to those without HIV. Moreover, TB is the leading cause of death among PLHIV (in 2015, one in three deaths in PLHIV was attributed to TB) (2). HIV and TB co-infection also places immense burden on health systems in LMICs and threatens global TB and HIV reduction targets (3, 4). The HIV/TB co-infection burden is heaviest in Africa which accounts for 74% of cases globally (2).

The high burden countries account for 85-89% of the estimated global burden of TB cases each year among PLHIV (5). Kenya is one of the countries with high burden of TB, HIV/TB and multi-drug resistant TB (MDR-TB) (5). Nonetheless, Kenya has made considerable progress in reducing the HIV/TB co-infection rate (from 45% in 2008 to 33% in 2015) (6). Although this rate is higher than the current global average of 15%, it is lower than the African region co-infection rate which was 36% in 2015. In 2015, approximately 25,030 (31%) of the 81,518 persons who developed TB in Kenya were HIV infected (6).

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To reduce the burden of TB among people living with HIV, the WHO recommends three interventions collectively termed 'the Three I's for TB/HIV namely: intensified TB case-finding, Isoniazid Preventive Therapy (IPT) and infection control for TB (7, 8). IPT is an evidence-based intervention with proven effectiveness of reducing the risk of TB in PLHIV by 33-62% (9). It is recommended for individuals with documented latent infection with *Mycobacterium tuberculosis* to prevent progression to active disease, and for PLHIV in areas with high HIV prevalence and latent TB prevalence greater than 30% (7-9). IPT involves the provision of isoniazid (INH) tablets to PLHIV who are TB negative or have latent TB. The dose varies between 5mg/kg for children to 300 mg/kg for adults (10, 11). WHO guidelines strongly recommend at least 6 months of IPT for children and adults including pregnant women, PLHIV, those receiving anti-retroviral therapy (ART) and those who have successfully completed TB treatment (12). In areas of high prevalence and transmission of TB among PLHIV, IPT is conditionally recommended for 36 months as a proxy for lifelong or continuous treatment (12).

In 2012, Kenya adopted the 6 month IPT regimen for eligible persons intended to elicit TB prevention for a maximum period of two years (13). Countywide scale-up of IPT begun in March 2015 with Siaya, Kisumu, Migori, Homa-bay and Nairobi as the pioneer counties due to their high HIV rates (6). Its roll-out was complemented with an ambitious target of countrywide enrolling 90% of PLHIV (839,797 adults and 79,594 children) on IPT by December 2016 (6). However, widespread evidence of sub-optimal IPT implementation has been reported in Kenya (1, 6, 7). The latest IPT coverage survey indicated that only 29,924 (3.6%) adults and 7,934 (10%) children eligible were initiated on IPT in 2015 (6). While suboptimal IPT implementation is well documented, little is known about contextual factors that influence its implementation.

Moreover, the literature on its acceptability among health care providers is scant. This study responds to this gap through an in-depth analysis of the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya (a high HIV/TB burden country). Acceptability is one of the implementation outcomes used to assess how well implementation has occurred and provide insights on how this contributes to important health outcomes (14, 15). The study adopted Proctor and colleagues' definition of acceptability as 'the perception among implementation stakeholders that a given treatment, service, practice or innovation is agreeable, palatable or satisfactory' (14).

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METHODS

Study design: This was a qualitative descriptive study using semi-structured, in-depth interviews. The design, data collection, analysis and reporting were conducted in accordance with the consolidated criteria for reporting qualitative research (COREQ) (16).

Study setting: The study was conducted in three facilities in Nairobi City County which is one of the 47 counties in Kenya with a population of about 3,138,369 people between January and April 2017 (17). Nairobi County was selected because it is one of the pioneer counties for the national rollout of IPT in 2015 and hence it was expected that the health facilities in the county would be implementing the intervention. The study adopted a cross-sectional approach. Three public healthcare facilities - Facility A, Facility B and Facility C - were purposefully selected based on physical location, size, and the high volumes of HIV and TB patients who access integrated treatment services. Data were gathered from in-depth interviews with staff working in the HIV clinics- referred to here as Comprehensive Care Centres (CCCs) - in the three facilities. Facility A is a national referral hospital whose CCC houses about 45 health personnel of different cadres. At the time of the study, the total number of patients in HIV care was 10,226, with an IPT uptake of 5,733 in the last quarter of 2016. An average of 1,974 patients visited the clinic per month in the last quarter of 2016. Facility B is a County referral hospital. At the time of the study, it had about 25 healthcare providers in the CCC, 4,860 patients enrolled for care, with IPT uptake at 839 patients in the last quarter of 2016. Facility C is a sub-county hospital with about 25 healthcare providers in the CCC. At the time of the study, it had 1,133 patients enrolled in care, 205 of which were initiated on IPT in the last quarter of 2016.

Study participants: The study participants were health care providers (clinicians, nurses, pharmacists and counsellors) working in the HIV clinics of the selected health facilities between January and June 2017. Respondents must have been involved in the IPT programme and worked in the clinic for at least six months prior to the study. Those who were absent during study period were excluded. Eighteen health care providers from the three CCCs were purposefully selected to ensure adequate representation in terms of sex, job cadre and length of stay at the facility. All consented to participate in the study.

Sampling and recruitment: Study participants were recruited through purposive sampling. This was facilitated by the researcher (EW) and the head nurses of the study HIV clinics. Pre-study meetings were convened in the clinics with facility managers and clinic staff to promote the study to eligible participants. EW approached prospective participants and

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established contact to identify possible dates, times and venues for interviews with respect to the study period.

Data collection: In-depth interviews were conducted by the researcher (EW) using an interview guide patterned after the themes of the conceptual framework of factors affecting implementation outcomes by Chaudoir et al. (2013). The framework groups factors affecting acceptability under five main categories: organizational factors, patient-level factors, provider level factors, structural factors and innovation characteristics (Appendix 1). The interviews were conducted in English language at the health facilities, at the convenience of the participant and in private. Each session lasted about 45 minutes long and was audio-recorded. Data were collected between February and April 2017.

Research team: The corresponding author (EW) was a graduate student and not affiliated to the study sites. This provided confidence that the data obtained from the interviews were solely the participants' perceptions and not influenced by previous contact. Other authors had no previous contact with the study sites. EW is a data analyst, early career epidemiologist and implementation researcher. MA is a research scientist with interests in implementation science, health policy and systems strengthening research. EE is a health systems and policy as well as implementation researcher. LI is an associate professor in public health, demographer and implementation researcher. All authors are well versed in qualitative and quantitative methods.

Data analysis: Audio-recorded transcripts were transcribed verbatim. Inductive thematic analysis was conducted. Data verification for accuracy and completeness was done through reading and re-reading of the interview transcripts. Coding of the transcripts was done to identify keywords, messages, and patterns emerging from the data. The developed codes were matched to ensure integrity and similarity between the researchers. A codebook was developed after integration and collation of the identified codes. From the codebook, broader themes and sub-themes that emerged from the data were identified and reviewed to ensure they were appropriate for the interpretation (18). Some interview transcripts were shared with selected participants for cross-checking to enhance trustworthiness and validity of the data (19).

Ethical considerations: Participants were briefed of the study and their rights and provided with an information sheet. All participants signed an informed consent form prior to the interviews. Permission to access the selected health facilities was obtained from the management of the respective health facilities adhering to internal protocol.

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RESULTS

Eighteen health care providers from the CCC of the selected health care facilities participated in the in-depth interviews. Their demographic characteristics are presented in Table 1.

Table 1 Demographic characteristics of health care providers who participated in in-depth interviews at selected HIV clinics in Nairobi County, Kenya

Variable	Value	Facility A	Facility B	Facility C	Total
Sex	Males	5	1	1	7
	Females	3	4	4	11
Job category	Clinical officers	3	3	2	8
	Nurses	2	1	2	4
	Counsellors	2	1	1	4
	Pharmacists	1	1	-	2
Years of	< 1	-	-	2	2
Experience in	2 – 4	1	1	-	2
HIV/TB care	> 4	7	5	2	14
(years)					
Age (years)	≤ 30	1	2	1	4
	31 – 40	5	3	2	10
	41 – 50	1	-	-	1
	> 50	2	-	1	3

Factors affecting acceptability of IPT among health care providers

Although health care providers considered IPT to be an important intervention in provision of care for PLHIV, they indicated a number of concerns with IPT at different levels, which challenged their comfort, and satisfaction with the intervention. The factors are grouped and presented in the following categories: organizational factors, provider factors, patient level factors, innovation characteristics and structural level factors. The categories are adapted from constructs of the conceptual framework of multi-level factors affecting implementation outcomes by Chaudoir et al. (2013).

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1. Organizational factors

Organisational factors encompass factors related to the organizational context where IPT is implemented, in this case the CCCs. These factors should facilitate providers to implement the IPT programme effectively.

Increased workload

Most frontline providers complained of the high workload in the facility, which they felt negatively affected implementation of the IPT programme. Providers reported that the limited number of clinicians did not match the high volume of patients in the CCC. The procedures to be conducted on the patient before IPT initiation were also considered very long and hence a burden to a single clinician. Providers felt that more clinicians should be hired with some dedicated to IPT related activities in the CCCs.

> *"…by the time you do all the screening for conditions like hepatitis, before even convincing the patient to start IPT… it is a big workload because we have many patients waiting in line to be served." (Healthcare provider, Facility A)*

> *"To comment about the environment and the working condition, here as a national referral, we have very high workload...then if you follow the standard operating procedures to give IPT, it will take you very long to complete all those investigations, examinations and what have you… " (Health care provider, Facility A)*

Inconsistent Isoniazid drug supply

Most of the healthcare providers also mentioned stock-out of Isoniazid medication and other supplies related to the IPT programme in the facilities. They reported stock-outs in the previous year and considered this as a factor that greatly affected IPT delivery. Some providers felt that the erratic stocks and poor supply of the medications indicated lack of support for the IPT programme among policymakers and management. This, in turn, negatively affected their perception, morale and delivery of the medication to the patients.

> *"…We started the programme nicely, empowering patients, counselling them on IPT, and encouraging them to take IPT… and then all of a sudden from nowhere, IPT drugs are not available" (Health care provider, Facility C)*

> *"My biggest challenge with the management [in CCC] is when there is erratic supply of IPT…So the patients were out of medication for some time and when you send them*

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out to buy them; of course it's not possible for them to get the drug..." (Health care provider, Facility B)

2. Innovation characteristics

Innovation factors relate to aspects of the intervention (innovation) being implemented (IPT) which enhance its successful implementation by the health care providers.

Unclear IPT guidelines and standard operating procedures (SOPs)

Most of the healthcare providers expressed discomfort with the IPT guidelines and SOPs citing lack of clarity, which affected their delivery of the intervention. Providers recommended a revision of the guidelines with specific regard to eligibility criteria and clarity on ruling-out active and latent TB before prescription; duration of IPT; and national consensus on IPT-related services as part of the HIV/TB collaborative activities since some of the services differed among facilities e.g. provision of IPT with pyridoxine (to prevent peripheral neuropathy) versus IPT alone and monthly versus three-monthly drug re-fills.

"I think it [IPT] is a good idea but the problem is with the protocol, the SOPs. They are not very clear. They are not well documented..." (Health care provider, Facility A)

"...They told us in the training that we should give IPT every month to the patient. We are not comfortable with it...we prefer every three months refill as we have been doing. May be they should re-evaluate these guidelines..." (Health care provider, Facility C)

Long duration of IPT

Health care providers largely expressed discomfort with the long duration of the IPT treatment regimen. They reported this to be a critical factor that influenced their delivery of the intervention mainly because of pill-burden and adverse effects reported by patients on IPT. Most respondents recommended a reduced duration of the drug with the help of suitable research.

"If I had a chance, I would give an IPT that would be taken once. Not the daily one for six months. That's a long time..." (Health care provider, Facility C)

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3. Provider-related factors

Factors related to the health care providers themselves were considered to affect the perception and implementation of IPT in the clinics.

Provider information and training on IPT

Health care providers indicated that they needed to be empowered on the administration of IPT through additional information and training on IPT. Some of the providers cited limited or no specific training on IPT administration, which limited their ability to deliver the intervention. They recommended revision of guidelines and additional training on IPT, driven by policymakers as well as regular monitoring and reporting of IPT outcomes from research to guide implementation.

> *"…Some of us have not been taken through training on IPT. It was just introduced and you are told, "give IPT for this duration"… So I feel we should have been taken through training to know more about the IPT even before rolling it out." (Healthcare provider, Facility A)*

Peer influence and perceptions on IPT

Peer influence also affected the perception of health care providers about IPT. The satisfaction of other health care providers with the intervention influenced their colleagues in the CCCs. Negative perceptions or doubts about the intervention by some health care providers affected the perception and delivery of IPT by the fellow providers.

> *"…Colleagues say that patients tell them "I've seen a friend of my husband who took [IPT]…", you know. So that experience with my colleagues from the patients' mouth talking…. in fact, part of it was the reason why this facility delayed as a hospital to start IPT." (Healthcare provider, Facility B)*

4. Patient-related factors

Factors relating to the patients were thought to considerably affect health care providers' perceptions and delivery of IPT.

Non-adherence to IPT and IPT side effects on Patients

Most health care providers reported non-adherence of their patients to IPT after initiation. Non-adherence was believed to be as a result of fear of side-effects and pill burden among the patients. Health care providers felt that development of side-effects in some patients after IPT affected adherence to IPT by other patients. Participants expressed concern that non-

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adherence would eventually lead to development of resistance to isoniazid drugs in the long run causing multi-drug resistant (MDR-TB) or extensively drug-resistant TB (XDR-TB). Due to this, some providers reported basing their decision to deliver IPT on the immunological, virological and clinical state of the patients, while some considered the drug regimen of the patients. Ultimately, this influenced whether eligible patients were initiated or not. Respondents recommended considerations of patient clinical state and drug regimen and argued for these to be added to the IPT guidelines.

> *"…At least for them to do a research and find out if these side-effects are really associated with IPT. But if it is found to be safe to use, I would not have any other recommendations…Uptake reduced because they were not starting anyone else on IPT for fear of side-effects and death." (Healthcare provider, Facility A)*

Pill burden among patients

Health care providers also felt that IPT increased the pill burden among the patients which affected patients' adherence to the medication. Patients complained of the difficulty in adhering to isoniazid drugs while some completely declined to take the medication due to high number of pills prescribed for PLHIV. As a result, providers recommended that a shorter duration formulation of IPT for the patients would help tackle this problem.

> *…"patients feel that these drugs are so many and some say they don't want to start these drugs together…" (Healthcare provider, Facility A)*

> *"…if they can review the concentration now, then maybe find out the concentration that can still work and still be mild to the patients…because of the pill burden to these clients..." (Health care provider, Facility B)*

Inadequate patient information on IPT

Information about the benefits and effects of IPT was reported to be limited among the patients. This resulted in rumours and misconceptions about IPT among the patients thus straining the IPT programme with patients refusing to be initiated or disposing of the medication even after being briefed. Providers expressed concern over the lack of consensus and support regarding patient education activities in the CCCs for IPT and recommended intervention from stakeholders and policymakers.

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> *"…We should conduct continuous medical education, information which should be given to the patient and how the information should be given…" (Healthcare provider, Facility A)*

> *"I think they need to do more education to the people… actually, most clients decline because they have never heard about it…they would say 'I am being treated for TB yet I don't have TB signs' "... (Healthcare provider, Facility C)*

5. Structural factors

Structural factors relate to the wider policy environment as well as the physical and working environment of the healthcare providers.

Inadequate policymakers' support in the IPT implementation

Most of the providers cited limited commitment at policy level to ensuring effective implementation and streamlining of the IPT programme, which consequently demotivated them. Majority of the interviews were of the opinion that strong commitment and explicit support from the policy makers and programme managers for the IPT programme would be necessary for effective implementation of the programme. Areas of support identified include advocacy for IPT, improved supply of isoniazid drugs and proper monitoring and evaluation of the IPT.

> *"…there is no initiative by those who are concerned in the TB programme. They need to make sure that they insist on IPT, and put some regulations or some rules to be followed to ensure IPT is given to every eligible patient…"(Healthcare provider, Facility A)*

> *"The people concerned should be more involved in the programme. We are giving IPT but they are not fully engaged. We don't get any feedback from them. They should monitor the supply of drugs and effects of IPT." (Health care provider, Facility B)*

Limited health care providers' involvement in IPT guideline development

Respondents also indicated that there was pressure from policymakers to implement the proposed IPT policy guidelines during their introduction or revision at the CCCs without provider involvement. This made them prescribe the intervention without actually being comfortable with its delivery.

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"We were told these are the guidelines and we should follow…before they change the guidelines we should be involved…At the moment I don't feel like we are involved in this…" (Health care provider, Facility C)

Poor integration of IPT-related services

Some health care providers reported poor integration of IPT services in the clinic that affected the programme. They felt that clinical examinations required before IPT initiation should be performed in the same facility and the costs subsidized so that all patients undergo the tests to ascertain eligibility for IPT. They considered this a role of the management and policymakers to ensure that the IPT programme was effectively implemented.

". …if we do [all] the tests from here, it will take like 30 minutes to do everything and give the patient IPT. When they come again for check-ups, we can still do them again from here, and it takes less time and we get results in real time….it will even be faster for the patients" (Healthcare provider, Facility A)

The factors affecting IPT acceptability among healthcare providers in the selected facilities are summarised in a conceptual framework as shown in Appendix 2.

DISCUSSION

This study assessed the factors associated with provider acceptability of IPT in selected clinics in Nairobi City County Kenya. We grouped these factors into five broad categories guided by previous literature viz. organisational, provider, patient, innovation and structural level factors. These constructs were in agreement with those presented in the literature (20).

Among these findings, inadequate high-level commitment and support for the IPT programme by higher programme managers and policymakers stood out as perhaps the biggest barrier to successful IPT implementation. Discussions with care providers reaffirmed previous findings that supportive supervision, consistent engagement of policy makers and higher-level supervisors with care providers as well as the depth of interaction between policymakers and practitioners remain crucial for effective IPT implementation. Indeed, poor monitoring and lack of supervision of the IPT programme by higher managers have been reported to influence IPT uptake in similar context (10, 21).

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Linked to high-level commitment and support is provider involvement in the formulation of policies and guidelines. The study found limited involvement of the health workers in the enactment and implementation of the IPT guidelines. As a result, most respondents did not own the guidelines or were generally uncomfortable implementing them. Since only a few had received training and/or support in its implementation, they saw it as a challenge rather than an opportunity to improve the health of their clients, resulting in the healthcare providers feeling pressured by policymakers into IPT delivery. The look-warm ownership of IPT among providers because of inadequate engagement at formulation stage is not surprising and reflects evidence in this area that suggest successful implementation and compliance with such initiatives require mechanisms that help enforce official guidelines, address capacity gaps, and enhance public awareness (22).

However, lack of involvement in the development of the IPT guidelines was not the only factor that made providers uncomfortable implementing the guidelines: the nature of an intervention itself, (IPT in this case), have been shown to affect implementation outcomes (20, 23). In the case of this study, IPT intervention-related factors greatly influenced the acceptability of IPT among care providers. The lack of clarity on some of the provisions of the guidelines hindered the effectiveness and thus acceptability of the intervention by the providers in the clinics surveyed. This finding resonates with evidence from other studies (21, 24), and echoes the need for a well-planned engagement process with care givers whenever such guidelines are being developed and the need to make these as simple as possible.

Similarly, better integration of IPT-related services at the clinics could significantly improve the delivery of IPT in the study clinics. Integration could entail amalgamating all or most of the IPT-related procedures in one room/space. This can reduce challenges such as loss-to-follow-up in TB/HIV treatment, health worker and patient movements within the clinic. Ultimately, this would lessen provider workload. Lack of coordination between TB and HIV activities has been reported as a barrier to IPT implementation elsewhere (21). In another study indicated that performing reading and interpreting TSTs in the context of busy HIV clinics was a challenge for both patients and staff, negatively affecting the implementation of the IPT programme (25).

Moreover, health providers questioned the efficacy of Kenya's IPT approach to identifying latent TB considering the Kenyan IPT guidelines recommend a symptomatic algorithm and

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no Tuberculin Skin Test (TST) for IPT eligibility. Care providers have previously called for clarity of guidelines (25). Perhaps, this explains the lack of awareness among some providers of the benefits of IPT in some LMIC (21). Investigation of optimal duration, safety and efficacy of IPT and its role in reducing TB risk, particularly under programme conditions has been strongly recommended by the WHO, Stop TB plan (26).

Previous studies have hypothesised that provider-level factors could predict implementation outcomes (23, 27). In our study, provider-related factors such as limited information and inadequate empowerment on IPT influenced acceptability of IPT, confirming similar findings in South Africa where lack of knowledge and experience with IPT were reported to be the primary barriers to IPT implementation (21). A similar study noted that inadequate training and lack of guidelines influenced IPT implementation in Ethiopia (10). It is therefore important that provider training and information is prioritised by the health system before implementation to achieve the desired outcomes (28). Additionally, technical assistance during implementation including retraining of the providers, training new staff, emotional support, and mechanisms to promote local problem solving is critical for the IPT intervention (27).

Patient-level predictors explain meaningful variance in implementation outcomes and are considered important factors that should be measured when assessing the implementation of interventions (20). This study identified poor adherence and pill burden among patients as key barriers to IPT acceptance among providers and patients. Adherence to IPT treatment is a critical factor that needs consideration when scaling treatment services in developing countries. Even though we used an exploratory approach to investigate IPT acceptance among providers, the providers reporting fear of isoniazid drug-resistance among patients should be cause for concern. This is particularly so because of the gradual increase in drug-resistant TB cases in Kenya (from 112 to 1300 in 2016) (29). Policymakers, health care providers and practitioners have questioned the implications of poor IPT adherence to drug-resistant TB disease especially in the case of long course INH mono-therapy (30, 31). To improve information on IPT among patients in order to boost uptake and thus enhance IPT effectiveness, national advocacy and patient empowerment through information provision is needed, among other interventions. The Global Plan to Stop TB has also recommended the investigation of implementation of IPT recommended policies on the proportion of PLHIV who develop TB disease and mortality (12).

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In the organizational context, heavy workload on health care providers and isoniazid stock-outs in the HIV clinics discouraged providers from initiating patients into IPT fearing for lack of drug adherence and associated side effects. Heavy workload among providers can often result in compromised quality and should be addressed as part of organisational context reforms to support IPT. In our study, this could be explained by the fact that the study clinics served a large population catchment area and not necessarily because the quality offered attracted patients to the clinics. Another reason for the heavy workload was inadequate staffing especially with regards to IPT trained staff. Ultimately, both factors risked the quality of care IPT patients received.

Strengths and Limitations

This study, to our knowledge, is among the first to assess the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya. The adaptation of existing theory and literature to guide the study enabled the collection of exhaustive context-specific information at different levels of the health system. The inclusion of both clinical and non-clinical personnel as key-informants in the interviews enabled the collection of information at different levels and cadres of health service provision thereby enhancing validity of the data. This study adhered to consolidated criteria for reporting qualitative research (COREQ).

Purposive selection of the health facilities may limit the generalizability of the findings from this study to other HIV clinics in Nairobi County. However, the study was context-specific and the aim was to elicit in-depth information on IPT acceptability in this context, which may inform health service provision and policy in health systems of similar context.

Finally, the study was conducted among city hospitals, which are presumably better resourced as compared to those in other locations. Therefore, the IPT programme was expected to be better managed as opposed to other non-city HIV clinics. This could contribute to better acceptability of IPT among the providers whose concerns may not entirely reflect that of health care providers in other clinics in Nairobi County. Further studies aiming for generalizability should control for the tier of health facilities in their assessment of IPT acceptability.

Conclusion

The study gives insight of the complexity of factors affecting IPT implementation and the value of qualitative methods and guiding frameworks to elucidate these factors. The

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acceptability of IPT in this context was influenced by factors at different levels namely: organizational level, provider level, patient level, innovation characteristics and structural level factors. Ensuring optimal acceptability of IPT among health care providers will require expanded depth of engagement with both providers and patients, and on-the-job design specific actions to support providers in implementation.

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Patient consent: Not required as study participants were health care providers.

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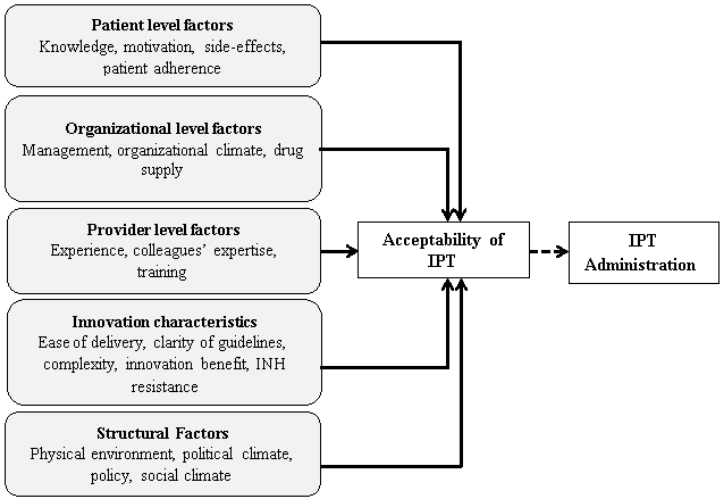

Conceptual framework of factors affecting acceptability of IPT among health care providers. Adapted from Chaudoir et al. (2013)

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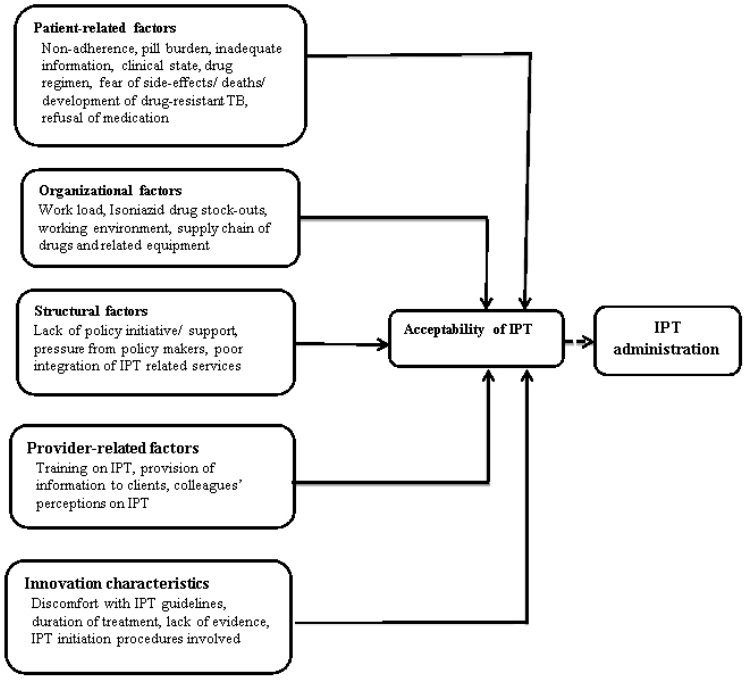

Conceptual framework of factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya

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Reporting checklist for qualitative study.

Based on the SRQR guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

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		Reporting Item	Page Number
	#1	Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended	1
	#2	Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions	2
Problem formulation	#3	Description and signifcance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement	4,5
Purpose or research question	#4	Purpose of the study and specific objectives or questions	5
Qualitative approach and research paradigm	#5	Qualitative approach (e.g. ethnography, grounded theory, case study, phenomenolgy, narrative research) and	6

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Researcher characteristics and reflexivity	#6	Researchers' characteristics that may influence the research, including personal attributes, qualifications / experience, relationship with participants, assumptions and / or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results and / or transferability	7
Context	#7	Setting / site and salient contextual factors; rationale	6
Sampling strategy	#8	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g. sampling saturation); rationale	6
Ethical issues pertaining to human subjects	#9	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	7
Data collection methods	#10	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources / methods, and modification of procedures in response to evolving study findings; rationale	7
Data collection instruments and technologies	#11	Description of instruments (e.g. interview guides, questionnaires) and devices (e.g. audio recorders) used for data collection; if / how the instruments(s) changed over the course of the study	7
Units of study	#12	Number and relevant characteristics of participants, documents, or events included in the study; level of	6

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		participation (could be reported in results)	
Data processing	#13	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymisation / deidentification of excerpts	7
Data analysis	#14	Process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale	7
Techniques to enhance trustworthiness	#15	Techniques to enhance trustworthiness and credibility of data analysis (e.g. member checking, audit trail, triangulation); rationale	7
Syntheses and interpretation	#16	Main findings (e.g. interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-14
Links to empirical data	#17	Evidence (e.g. quotes, field notes, text excerpts, photographs) to substantiate analytic findings	8-14
Intergration with prior work, implications, transferability and contribution(s) to the field	#18	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application / generalizability; identification of unique contributions(s) to scholarship in a discipline or field	14-17
Limitations	#19	Trustworthiness and limitations of findings	17
Conflicts of interest	#20	Potential sources of influence of perceived influence on study conduct and conclusions; how these were managed	18
Funding	#21	Sources of funding and other support; role of funders in data collection, interpretation and reporting	18

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Factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya: A qualitative study

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Factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya: A qualitative study

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Research question

What are the factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya?

ABSTRACT

Objective

Despite being globally recommended as an effective intervention in tuberculosis (TB) prevention among people living with HIV (PLHIV), Isoniazid preventive therapy (IPT) implementation remains sub-optimal, especially in sub-Saharan Africa. This study explored the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya, a high HIV/TB burden country.

Design

A qualitative study was conducted using in-depth interviews with health care providers in selected HIV clinics. All conversations were audio-recorded, transcribed verbatim and analysed using a thematic approach.

Setting

The study was conducted in the HIV clinics of three purposefully selected public health care facilities in Nairobi County, Kenya between February 2017 and April 2017.

Participants

Eighteen purposefully selected health care providers (clinicians, nurses, pharmacists and counsellors) working in the HIV clinics participated in the study.

Results

Provider acceptability of IPT was influenced by factors relating to the organizational context, provider training on IPT and their percerption on its efficacy, length and clarity of IPT guidelines and standard operation procedures, as well as structural factors (policy, physical and work environment). Inadequate high-level commitment and support for the IPT programme by programme managers and policymakers were found to be the major barriers to successful IPT implementation in our study context.

Conclusion

This study provides insight into the complexity of factors affecting IPT implementation in Kenya. Ensuring optimal acceptability of IPT among health care providers will require expanded depth of engagement by policy makers and IPT programme managers with both providers and patients, as well as on-the-job design specific actions to support providers in implementation. Such high-level commitment and support is consequently essential for quality delivery of the intervention.

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Key Words: Acceptability, Isoniazid, Comprehensive care centre, health care provider, HIV/TB

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Article Summary:

Strengths and Limitations of this study

- To our knowledge, this is among the first qualitative studies exploring factors influencing the acceptability of Isoniazid Preventive Therapy among health care providers in the context of HIV clinics providing integrated HIV and TB services.
- The inclusion of both clinical and non-clinical health care providers in the study enabled the collection of information at different levels and cadres of health service provision thereby enhancing the breadth and validity of the information obtained.
- The adaptation of existing theory and literature to guide the study enabled the collection of context-specific information at different levels of the health system.
- Purposive selection of the health facilities included in the study may limit the generalisability of our findings beyond the study context. However, the conclusions and recommendations are useful and applicable in other contexts.

Introduction

Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) co-infection remain a major public health threat and challenge to health systems in many Low and Middle-income Countries (LMICs). According to the World Health Organization (WHO), people living with HIV (PLHIV) accounted for about 10% of the 10.4 million reported TB cases in 2016 (1). PLHIV are about 20 to 30 times more likely to develop active TB compared to those without HIV. Moreover, TB is the leading cause of death among PLHIV (in 2016, 374 000 deaths in PLHIV were attributed to TB) (1). HIV and TB co-infection also places immense burden on health systems in LMICs and threatens global TB and HIV reduction targets (2, 3). The HIV/TB co-infection burden is heaviest in sub-Sahara Africa (1).

Kenya is one of the countries with high burden of TB, HIV/TB and multi-drug resistant TB (MDR-TB) (4). Overall TB incidence for Kenya was 169,000 in 2016 and an incidence rate of 348 per 100,000 population (1, 5). Nonetheless, Kenya has made considerable progress in reducing the HIV/TB co-infection rate (from 45% in 2008 to 30% in 2016) (6, 7). In 2015, approximately 25,030 (31%) of the 81,518 persons who developed TB in Kenya were HIV infected (6).

To reduce the burden of TB among people living with HIV, the WHO recommends three interventions collectively termed 'the Three I's for TB/HIV' namely: intensified TB case-finding (ICF), Isoniazid Preventive Therapy (IPT) and infection control for TB (8, 9). IPT is an evidence-based intervention with proven effectiveness of reducing the risk of TB in

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PLHIV by 33-62% (10). It is recommended for individuals with documented latent infection with *Mycobacterium tuberculosis* to prevent its progression into an active disease, and for PLHIV in areas with high HIV prevalence and latent TB prevalence greater than 30% (8-10). IPT involves the provision of isoniazid (INH) tablets to PLHIV who are TB negative or have latent TB. The dose varies between 5mg for children to 300 mg for adults (11, 12). WHO guidelines recommend at least 6 months of IPT for children and adults including pregnant women, PLHIV and those who have successfully completed TB treatment (13). In areas of high prevalence and transmission of TB among PLHIV, IPT is conditionally recommended for 36 months as a proxy for lifelong or continuous treatment (13).

Kenya adopted the 6 month IPT regimen for eligible persons in 2012. (14). However, IPT implementation for PLHIV started in 2012 at selected facilities under the United States government supported initiative, the President's Emergency Plan For AIDS Relief (PEPFAR) (14). County-wide scale-up of IPT began in March 2015 with Siaya, Kisumu, Migori, Homa-bay and Nairobi being the pioneer Counties due to the high HIV prevalence rates in these Counties (6). The roll-out was accompanied by an ambitious country-wide target of enrolling 90% of PLHIV on IPT by December 2016 (6). Implementation is supported by various cadres of health care providers. IPT is prescribed by a registered clinician (usually clinical officers in most HIV clinics), who also assesses IPT eligibility by ruling out contraindications such as peripheral neuropathy or liver disease and recommend confirmatory laboratory tests if deemed necessary. Nurses are involved in measuring vital signs and linking new patients to care. Clinicians and nurses are also involved in intensified TB case finding procedure using a standard ministry of health standard ICF/IPT screening tool. They also monitor the treatment of patients that remain in care and update their IPT registers. Counsellors are involved in counselling new patients, caregivers (in the case of child patients) and patients that remain in care on the benefits of IPT to enhance adherence. Pharmacists dispense the drugs to the patients at initiation as well as during monthly re-fill visits. Social workers and community health volunteers are involved in contact tracing and linking both HIV and missing TB cases to care.

Despite the country's move to scale-up IPT, there is widespread evidence of sub-optimal implementation (6, 8, 15). The latest IPT coverage survey indicated that only 3.6% of adults and 10% children eligible were initiated into IPT in 2015 (6). While suboptimal IPT implementation is well documented, little is known about contextual factors that influence its implementation. Moreover, limited information exists on popular perceptions regarding its acceptability and factors influencing its application among health care providers in Kenya.

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Yet, it is widely recognised that health care providers are the front-line people delivering health care interventions and their acceptability is key to successful implementation and effectiveness of health care interventions (16, 17). This study responded to this gap through an in-depth analysis of the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya. Assessing IPT acceptability among health care providers can help to better understand barriers and facilitators of IPT delivery at health facilities and therefore guide TB preventive care. Acceptability is also an important outcomes measure used to assess the effectiveness of implementation and to provide insights into how this contributes to health outcomes (18, 19).

The study adopted Proctor et al's definition of acceptability as 'the perception among implementation stakeholders that a given treatment, service, practice or innovation is agreeable, palatable or satisfactory' (19).

METHODS

Study design: This was a qualitative descriptive study using semi-structured, in-depth interviews. The design, data collection, analysis and reporting were conducted in accordance with the Standards for Reporting Qualitative Research (SRQR) (20).

Study setting: The study was conducted in three facilities in Nairobi City County - one of the 47 Counties in Kenya - with a population of about 3,138,369 people between February and April 2017 (21). Nairobi County was selected because it was one of the pioneer Counties for the national rollout of IPT in 2015. The study adopted a cross-sectional approach. Three public health care facilities (for purposes of anonymity coded as Facility A, Facility B and Facility C) were purposefully selected based on physical location, size, and the high volumes of HIV and TB patients accessing integrated treatment services. Data were gathered through in-depth interviews with staff working in the HIV clinics referred to as Comprehensive Care Centres (CCCs). At the time of the study, Facility A had about 45 health personnel of different cadres supporting 10,226 HIV patients in its CCC. The facility's IPT uptake was 70% in the last quarter of 2016. An average of 1,974 patients visited the clinic per month in the last quarter of 2016. Similarly, Facility B had about 25 health care providers in the CCC, supporting 4860 patients and an IPT uptake of 68% in the last quarter of 2016. On the other hand, Facility C had about 25 health care providers in the CCC, 1,133 patients enrolled in care, 65% of whom were on IPT in the last quarter of 2016.

Study participants: The study involved eighteen health care providers – fourteen clinicians (clinical officers, nurses, and pharmacists) and four non-clinicians (counsellors) - working in the care centres of the selected health facilities. Respondents must have been involved in the

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IPT programme and worked in the clinic for at least six months prior to the study. Those who were absent during study period were excluded. The providers were purposefully selected to ensure adequate representation in terms of gender, job cadre and length of stay at the facility. All consented to participate in the study.

Sampling and recruitment: Study participants were recruited through purposive sampling. This was facilitated by the lead researcher (EW) and the head nurses of the study HIV clinics. Pre-study meetings were convened in the clinics with facility managers and clinic staff to promote the study to eligible participants. Prospective participants were approached and contact established to agree on interview logistics such as dates, times and venues.

Data collection: In-depth interviews were conducted using an interview guide patterned after the themes of the conceptual framework of factors affecting implementation outcomes by Chaudoir et al. (2013). The interviews were led by the lead researcher. The framework groups factors affecting acceptability under five main categories: structural factors, innovation characteristics, provider level factors, patient-level factors and organizational factors (Figure 1). The interviews were privately conducted in the English language within the health facilities. Each session was approximately 45 minutes long and was audio-recorded. Data were collected between February and April 2017.

Research team and reflexivity: The corresponding author (EW) is a data analyst, early career epidemiologist and implementation science researcher. EW was a graduate student and not affiliated to the sites at the time of study. This provided confidence that the data obtained from the interviews were solely the participants' perceptions and not influenced by previous contact. Other authors had no previous contact with the study sites. MA is a research scientist with interests in implementation science, health policy and systems strengthening research. EE is a health system, policy and implementation science researcher. LI is an associate professor in public health, with interests in demography and implementation science. All authors are well versed in mixed methods research approaches.

Data analysis: Audio-recorded transcripts were transcribed verbatim. Inductive thematic analysis was conducted. Data verification for accuracy and completeness was done through reading and re-reading of the interview transcripts. Coding of the transcripts was done to identify themes, messages, and patterns emerging from the data. The developed codes were matched to ensure integrity and similarity between the researchers. A codebook was developed after integration and collation of the identified codes. From the codebook, broader themes and sub-themes that emerged from the data were identified and reviewed to ensure they were appropriate for the interpretation (22). As part of a validation process and to elicit

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feedback from the participants, an anonymised summary of the findings was shared with randomly selected participants.

Ethical considerations: Study approval and ethical clearance was obtained from the University of the Witwatersrand Human Research Ethics Committee (HREC) (approval No. M161164), Kenyatta National Hospital - University of Nairobi Ethics and Research Committee (approval No. P11/01/2017) and the Kenya Medical Research Institute Ethics and Research Committee (approval No. RES/7/3/1). A research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI) to conduct the study in Nairobi County, Kenya. Participants were briefed about the study and their rights and provided with an information sheet. Informed consent was obtained from all study participants prior to the interviews. Permission to access the selected health facilities was obtained from the management of the respective health facilities.

Patient and public involvement: The study aimed to address factors affecting the acceptability of IPT among health care providers, an implementation outcome which may affect the delivery of the intervention to patients. The identified factors may help improve the quality of care for PLHIV by improving the implementation of IPT. Initial findings of the broader study were shared with health care providers. Findings of this study will be shared with broader programme and scientific communities through dissemination workshops, conferences and summary fact-sheets.

RESULTS

The demographic characteristics of the eighteen health care providers who participated in the in-depth interviews are presented in Table 1.

Table 1: Demographic characteristics of health care providers who participated in in-depth interviews per health facility

Variable	Value	Facility A	Facility B	Facility C	Total
Sex	Males	5	1	1	7
	Females	3	4	4	11
Job category	Clinical officers	3	3	2	8
	Nurses	2	1	2	4
	Counsellors	2	1	1	4
	Pharmacists	1	1	-	2

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Length of stay in	< 1	-	-	2	2
CCC (years)	2 – 4	1	1	-	2
	> 4	7	5	2	14
Age (years)	≤ 30	1	2	1	4
	31 – 40	5	3	2	10
	41 – 50	1	-	-	1
	> 50	2	-	1	3

Factors affecting acceptability of IPT among health care providers

Although health care providers considered IPT to be an important intervention in the provision of care for PLHIV, they indicated several concerns with IPT at different levels that challenged their comfort and satisfaction with the intervention. The factors are grouped and presented in the following categories: structural factors, innovation characteristics provider and patient related factors, and organizational factors.

1. Structural factors

Structural factors relate to the wider policy environment as well as the physical and working environment of the health care providers.

Inadequate high level support for IPT implementation

Most of the providers cited limited commitment at policy level in ensuring effective implementation and streamlining of the IPT programme, which consequently demotivated providers. A majority of the providers stated that strong commitment and explicit support from the policy makers and IPT programme managers was necessary for effective implementation of the programme. Areas of support identified included advocacy for IPT, improving supply of isoniazid drugs and proper monitoring and evaluation of the IPT.

> *"...there is no initiative by those who are concerned in the TB programme. They need to make sure that they insist on IPT, and put some regulations or some rules to be followed to ensure IPT is given to every eligible patient..." (Non-clinical health care provider)*

> *"The people concerned should be more involved in the programme. We are giving IPT but they are not fully engaged. We don't get any feedback from them. They should monitor the supply of drugs and effects of IPT." (Clinical health care provider)*

Limited engagement with health care providers in the development of IPT guideline

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Providers lamented that there was pressure from policymakers to implement the IPT policy guidelines during their introduction or revision at the CCCs without provider involvement. They noted that the consequence of this was to prescribe IPT without the full understanding its implications.

> *"We were told these are the guidelines and we should follow…before they change the guidelines we should be involved…At the moment I don't feel like we are involved in this…." (Clinical health care provider)*

Poor integration of IPT-related services

Most of the providers spoke of poor integration of IPT services in the clinic, noting that this hampered the delivery of the programme. It was noted that most of the clinical examinations required before IPT initiation were conducted in separate departments at additional costs. They felt that the examinations should be performed in the same facility and the costs subsidized to encourage uptake among patients. Most respondents felt that facility management and policymakers had a key role in supporting effective implementation of the programme

> *". ...if we do [all] the tests from here, it will take like 30 minutes to do everything and give the patient IPT. When they come again for check-ups, we can still do them again from here, and it takes less time and we get results in real time….it will even be faster for the patients" (Clinical health care provider)*

2. Innovation characteristics

Innovation factors relate to aspects of the intervention which enhance the chances of successful implementation. Discussions with care providers revealed two main issues linked to IPT as an innovation that hampered its acceptance and implementation in their context. These are presented below.

Unclear IPT guidelines and standard operating procedures (SOPs)

Providers expressed discomfort with the IPT guidelines and SOPs citing lack of clarity. In particular, providers noted that guidelines on eligibility criteria, on how to decide whether a patient had active and latent TB and on the duration of IPT were unclear. Providers recommended a revision of the guidelines with specific regard to eligibility criteria and clarity on ruling-out active and latent TB before prescription. There was also a lack of national consensus on IPT-related services as part of the HIV/TB collaborative activities

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since some of the services differed among facilities. For instance, the provision of IPT with pyridoxine (to prevent peripheral neuropathy) versus IPT alone and monthly versus three-monthly drug re-fills were reported to vary from facility to facility.

> *"I think it [IPT] is a good idea but the problem is with the protocol, the SOPs. They are not very clear. They are not well documented..." (Clinical health care provider)*

> *"…They told us in the training that we should give IPT every month to the patient. We are not comfortable with it…we prefer three-month refill as we have been doing. Maybe they should re-evaluate these guidelines…" (Clinical health care provider)*

Long duration of IPT

Health care providers largely expressed discomfort with the long duration of the IPT treatment regimen. They reported this to be a critical factor that influenced their delivery of the intervention mainly because of pill-burden and adverse effects reported by patients on long term therapy. Most respondents recommended a reduced duration of the drug with the help of suitable research.

> *"If I had a chance, I would give an IPT that would be taken once. Not the daily one for six months. That's a long time..." (Clinical health care provider)*

3. Provider-related factors

Factors related to individual health care providers such as experience and knowledge of IPT and peer influence also had considerable bearing on the perception and implementation of IPT in the clinics.

Provider information and training on IPT

Both clinical and non-clinical providers indicated that they needed to be empowered on the administration of IPT through additional information and training. Some providers cited limited or no specific training on IPT administration, which limited their ability to deliver the intervention. They recommended revision of guidelines and additional training on IPT, driven by policymakers as well as regular monitoring and reporting of IPT outcomes from research to guide implementation.

> *"…Some of us have not been taken through training on IPT. It was just introduced and you are told, "Give IPT for this duration" … I feel we should have been taken through training to know more about the IPT even before rolling it out." (Clinical health care provider)*

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Peer influence and perceptions on IPT

The satisfaction of other health care providers with the intervention influenced their colleagues in the CCCs. Negative perceptions or doubts about the intervention by some health care providers affected the perception and delivery of IPT by the fellow providers.

> *"…Colleagues say that patients tell them "I've seen a friend of my husband who took [IPT]…", you know. So that experience with my colleagues from the patients' mouth talking…. in fact, part of it was the reason why this facility delayed as a hospital to start IPT." (clinical health care provider)*

4. Patient-related factors

Factors relating to the patients were thought to considerably affect health care providers' perceptions and delivery of IPT. The following are health care providers' reported patient-related factors affecting provider acceptability of IPT.

Non-adherence to IPT and IPT side effects on Patients

Non-adherence to IPT after initiation by patients was considered a demotivating factor in administering IPT. Non-adherence was attributed to fear of side-effects and pill burden among the patients. These views were shared by both the clinical and the non-clinical providers. Providers also reported that some patients stopped using the therapy as a result of reported side-effects. These discouraged others who became aware of these side-effects from enrolling on the programme. Participants expressed concern that non-adherence would eventually lead to development of resistance to isoniazid drugs in the long run resulting in MDR-TB or extensively drug-resistant TB (XDR-TB). Due to this, some providers reported basing their decision to deliver IPT on the immunological, virological and clinical state of the patients, while some considered the drug regimen of the patients. Ultimately, this influenced whether or not eligible patients were initiated. Respondents recommended considerations of patient clinical state and drug regimen and argued for these to be added to the IPT guidelines.

> *"…At least for them to do a research and find out if these side-effects are really associated with IPT. But if it is found to be safe to use, I would not have any other recommendations…Uptake reduced because they were not starting anyone else on IPT for fear of side-effects and death." (Clinical health care provider)*

Pill burden among patients

Health care providers also felt that IPT increased the pill burden among the patients which affected patients' adherence to the medication. Providers described cases where patients

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complained of the difficulty in adhering to isoniazid drugs while some completely declined to take the medication due to the high number of pills prescribed for PLHIV. As a result, providers recommended that a formulation of IPT with shorter duration for the patients.

> *"... patients feel that these drugs are so many and some say they don't want to start these drugs altogether..." (Clinical health care provider)*

> *"...if they can review the concentration now, then maybe find out the concentration that can still work and still be mild to the patients...because of the pill burden to these clients..." (Non-clinical health care provider)*

Inadequate patient information on IPT

Information about the benefits and effects of IPT was reported to be limited among the patients. This resulted in rumours and misconceptions about IPT among the patients which led some patients to refuse to be initiated or to dispose of the medication even after being counselled. Providers expressed concern over the lack of consensus and support regarding patient education activities in the CCCs for IPT.

> *"...We should conduct continuous medical education, and review how we provide patients with information ..." (Non-clinical health care provider)*

> *"I think they need to do more education to the people... actually, most clients decline because they have never heard about it...they would say 'I am being treated for TB yet I don't have TB signs" (Clinical health care provider)*

5. Organizational factors

Organisational factors encompass factors related to the organizational context where IPT is implemented, in this case the CCCs. These factors affect effective implementation of IPT programmes.

Increased workload

Most clinical providers complained of the high workload in the facility, which they felt negatively affected implementation of the IPT programme. Providers reported that the limited number of clinicians did not match the high volume of patients in the CCC. The procedures to be conducted on the patient before IPT initiation were also considered very long and hence a burden to a single clinician. Providers called for hiring of staff to be dedicated to IPT related activities in the CCCs.

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"...by the time you do all the screening for conditions like hepatitis, before even convincing the patient to start IPT... it is a big workload because we have many patients waiting in line to be served." (Clinical health care provider)

"To comment about the environment and the working condition, here we have very heavy workload...then if you follow the standard operating procedures to give IPT, it will take you very long to complete all those investigations, examinations and what have you..." (Clinical health care provider)

Inconsistent Isoniazid drug supply

Providers also mentioned stock-out of Isoniazid medication and other supplies related to the IPT programme in the facilities as a major impediment to effective implementation and acceptance of the therapy. They reported stock-outs in the previous year and considered this a factor that greatly affected IPT delivery. Some providers felt that the erratic stocks and poor supply of the medications indicated lack of support for the IPT programme among policymakers and management. This, in turn, negatively affected their perception, morale and delivery of the therapy.

"...We started the programme nicely, empowering patients, counselling them on IPT, and encouraging them to take IPT... and then all of a sudden from nowhere, IPT drugs are not available" (clinical health care provider)

"My biggest challenge with the management [in CCC] is when there is erratic supply of IPT...So the patients were out of medication for some time and when you send them out to buy them; of course it's not possible for them to get the drug..." (Clinical health care provider)

The factors affecting IPT acceptability among health care providers in the selected facilities are summarised in figure 2.

DISCUSSION

This study assessed the factors associated with provider acceptability of IPT in selected clinics in Nairobi City County in Kenya. The factors have been grouped into five broad categories viz. organisational, provider-related, patient-related, innovation and structural level factors. These constructs are in agreement with those presented in the literature (23).

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Among these findings, limited high-level commitment and support for the IPT programme by higher programme managers and policymakers stood out as perhaps the biggest barrier to successful IPT implementation. Discussions with care providers reaffirmed previous findings that supportive supervision, consistent engagement between policy makers and higher-level supervisors with care providers as well as the in-depth interaction between policymakers and practitioners remain crucial for effective IPT implementation. The findings support previous evidence from similar contexts that showed that poor monitoring and lack of supervision of the IPT programme by higher managers influence IPT uptake (11, 24).

Linked to high-level commitment and support is provider involvement in the formulation of policies and guidelines. The study found limited involvement of the health care providers in the enactment and implementation of the IPT guidelines. As a result, most respondents did not own the guidelines or were generally uncomfortable implementing them. Since only a few had received training and/or support in its implementation, they saw it as a challenge rather than an opportunity to improve the health of their clients. In fact, providers across all the three facilities expressed their frustrations that they were being pressured to implement and deliver an intervention whose origin or implications they knew little about. The lukewarm ownership of IPT among providers as a result of the limited engagement at design stage is not surprising and reinforces evidence in this area suggesting that successful implementation and compliance with such initiatives require mechanisms that help enforce official guidelines, address capacity gaps, and enhance provider and patient awareness (25).
Another important finding from this study is how the nature of interventions (in this case IPT) affect implementation outcomes. The lack of clarity on some of the provisions of the guidelines meant that providers struggled to fully and effectively implement IPT provisions. This in turn, negatively impacted their acceptability of the intervention. This finding resonates with evidence from other studies (24, 26), and echoes the need for a well-planned engagement process with care givers whenever such guidelines are being developed and the need to make them as simple as possible.

Similarly, better integration of IPT-related services at the clinics could significantly improve the delivery of IPT. Integration could entail incorporation of all or most of the IPT-related procedures in one room/space. This can reduce challenges such as loss-to-follow-up in TB/HIV treatment thereby assisting health care providers monitor the patients on IPT. Ultimately, this would lessen clinical provider workload. Lack of coordination between TB and HIV activities has been reported as a barrier to IPT implementation elsewhere (24). One

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study indicated that performing reading and interpreting Tuberculin Skin Tests (TSTs) in the context of busy HIV clinics was a challenge for both patients and staff, negatively affecting the implementation of the IPT programme (27). In our study, providers questioned the efficacy of Kenya's IPT approach to identifying latent TB considering the Kenyan IPT guidelines recommend a symptomatic algorithm and no Tuberculin Skin Test for IPT eligibility. Care providers have previously called for clarity of guidelines, showing that this is a major challenge to effective implementation and acceptance of IPT (27). This may also explain the lack of awareness among some providers of the benefits of IPT in some LMIC (24). Investigation of optimal duration, safety and efficacy of IPT and its role in reducing TB risk, particularly under programme conditions has been strongly recommended by the WHO (28).

Previous studies have hypothesised that provider-level factors could predict implementation outcomes (29, 30). In our study, provider-related factors such as limited information and inadequate empowerment on IPT influenced acceptability of IPT. A general lack of knowledge and experience with IPT have also been reported as primary barriers to IPT implementation in South Africa and Ethiopia (24). It is therefore important that provider training and information is prioritised for both clinical and non-clinical providers before implementation to achieve the desired outcomes (31). Providers in our study also reported that lack of on-the-job training and support through mentorship and supportive supervision left them feeling inadequately equipped to handle emerging challenges associated with IPT implementation. These challenges highlight the need for tailor-made technical assistance during implementation including mentorship, retraining of the providers, training new staff, emotional support, and mechanisms that take into consideration the contextual challenges.

Another important determinant of IPT acceptability among providers in the study location were patient-level predictors. In our context, poor adherence and pill burden among patients were key barriers to IPT acceptance among providers and patients (as reported by providers). In low and middle income settings, adherence to IPT treatment is a critical factor that needs consideration when scaling treatment services. Despite poor patient adherence being a key factor affecting acceptability, there was lack of information among providers on evidence-based methods to monitor IPT adherence among patients. This might signify poor or lack of implementation of methods such as use of treatment buddies, lay health providers, community-based directly observed preventive therapy to monitor and enhance IPT

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adherence. The availability of resources for close monitoring, supervision and evaluation of IPT outcomes is strongly recommended by WHO (32).

Even though we used an exploratory approach to investigate IPT acceptance among providers, the providers reporting fear of isoniazid drug-resistance among patients should be cause for concern. This is particularly so because of the gradual increase in drug-resistant TB cases in Kenya (from 112 to 1300 in 2016) (15). Policymakers, health care providers and practitioners have questioned the implications of poor IPT adherence to drug-resistant TB disease especially in the case of long course INH mono-therapy (33, 34). To improve information on IPT among patients and boost uptake, national advocacy and patient awareness is needed, among other interventions.

In the organizational context, heavy workload on health care providers and isoniazid stock-outs in the HIV clinics discouraged providers from initiating patients into IPT, fearing for lack of drug adherence and associated side effects. Heavy workload among providers can often result in compromised quality and should be addressed as part of organisational context reforms to support IPT. In our study, this could be explained by the fact that the study clinics served a large population catchment area and not necessarily because the quality offered attracted patients to the clinics. Another reason for the heavy workload was inadequate staffing especially with regards to IPT trained staff. Ultimately, both factors risked the quality of care IPT patients received.

The findings of this study have important policy implications. Firstly, the lack of clarity of IPT guidelines highlights a need for revision and standardization which would promote consensus among health care providers. Secondly, the findings highlight the need for strengthened monitoring and evaluation with a well-defined feedback mechanism of reporting by health care providers on IPT indicators. Finally, building both technical and logistic capacity in HIV clinics is important to improving the acceptability and ultimately the delivery of IPT.

We recommend a number of interventions to improve health care provider acceptability in the context of the study clinics. First, involving health care providers in IPT guideline development and revision will make them more comfortable with implementation. Secondly, better integration of all IPT-related services in the same facility may help improve patient initiation, retention and follow-up of IPT. Additionally, training and continuous mentorship

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on IPT implementation for both clinical and non-clinical providers should be promoted in the health facilities to improve IPT acceptability and delivery.

Strengths and Limitations

This study, to our knowledge, is among the first to assess the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya. The adaptation of existing theory and literature to guide the study enabled the collection of exhaustive context-specific information at different levels of the health system. The inclusion of both clinical and non-clinical personnel as key-informants in the interviews enabled the collection of information at different levels and cadres of health service provision thereby enhancing validity of the data. This study adhered to the Standards for Reporting Qualitative Research (SRQR).

Purposive selection of the health facilities may limit the generalizability of the findings from this study to other HIV clinics in Nairobi County. However, the study was context-specific and the aim was to elicit in-depth information on IPT acceptability in this context, which may inform health service provision and policy in health systems of similar context.

Finally, the study was conducted among city hospitals, which are presumably better resourced as compared to those in other locations. Therefore, the IPT programme was expected to be better managed as opposed to other non-city HIV clinics. This could contribute to better acceptability of IPT among the providers whose concerns may not entirely reflect that of health care providers in other clinics in Nairobi County. Further studies aiming for generalizability should control for the tier of health facilities in assessing IPT acceptability.

Conclusion

The study gives insight of the complexity of factors affecting IPT implementation and the value of qualitative methods and guiding frameworks to elucidate these factors. The acceptability of IPT among health care providers in this context was influenced by factors at different levels namely: organizational level, provider level, patient level, innovation characteristics and structural level factors. Ensuring optimal acceptability of IPT among health care providers will require a robust engagement with both providers and patients by policy makers and IPT program managers, as well as on-the-job design specific actions to

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support providers in implementation. This high level commitment and support for IPT could improve provider acceptability and ultimately delivery of the intervention.

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Competing interests: The authors declare that they do not have any competing interests.

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Patient consent: Informed consent was obtained from all study participants prior to the interviews.

Author contributions: EW, MA, and LI contributed to the conceptualisation and design of the study including the development of the study tools. EW collected the data and did initial analysis and drafts of the manuscript. EE, MA and LI contributed to the data analysis, manuscript writing and editing. All authors read and approved the final version of the manuscript.

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Figure legends

Figure 1 Conceptual framework of factors affecting acceptability of IPT among health care providers. Adapted from Chaudoir et al. (2013)

Figure 2 Conceptual framework of factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya

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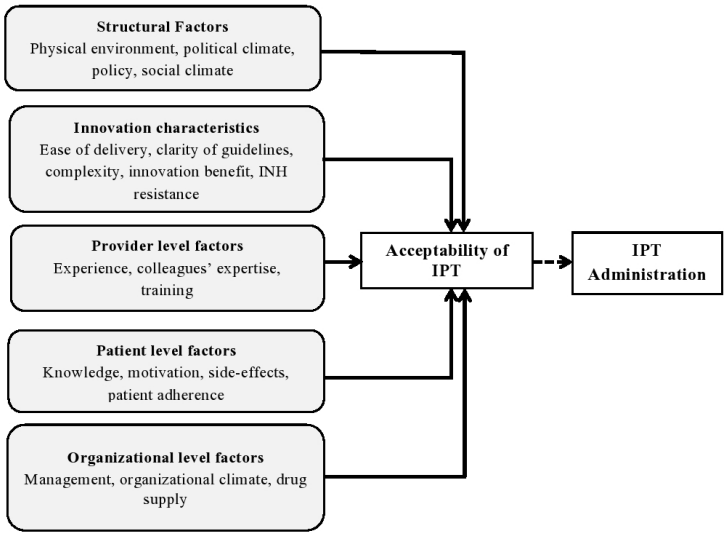

Figure 1 Conceptual framework of factors affecting acceptability of IPT among health care providers. Adapted from Chaudoir et al. (2013)

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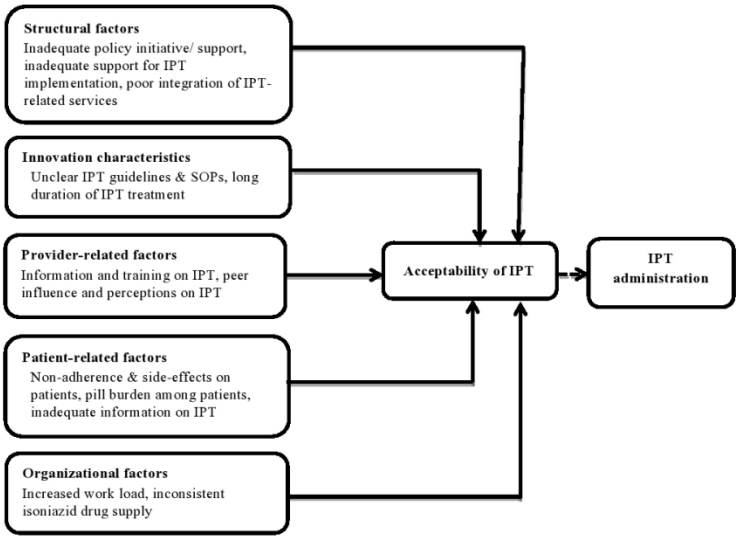

Figure 2 Conceptual framework of factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya

107x139mm (300 x 300 DPI)

Reporting checklist for qualitative study.

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Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

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		Reporting Item	Page Number
	#1	Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended	1
	#2	Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions	2
Problem formulation	#3	Description and signifcance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement	4,5,6
Purpose or research question	#4	Purpose of the study and specific objectives or questions	2,6
Qualitative approach and research paradigm	#5	Qualitative approach (e.g. ethnography, grounded theory, case study, phenomenolgy, narrative research) and	6

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		guiding theory if appropriate; identifying the research paradigm (e.g. postpositivist, constructivist / interpretivist) is also recommended; rationale. The rationale should briefly discuss the justification for choosing that theory, approach, method or technique rather than other options available; the assumptions and limitations implicit in those choices and how those choices influence study conclusions and transferability. As appropriate the rationale for several items might be discussed together.	
Researcher characteristics and reflexivity	#6	Researchers' characteristics that may influence the research, including personal attributes, qualifications / experience, relationship with participants, assumptions and / or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results and / or transferability	7
Context	#7	Setting / site and salient contextual factors; rationale	6
Sampling strategy	#8	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g. sampling saturation); rationale	6-7
Ethical issues pertaining to human subjects	#9	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	8
Data collection methods	#10	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources / methods, and modification of procedures in response to evolving study findings; rationale	7
Data collection instruments and technologies	#11	Description of instruments (e.g. interview guides, questionnaires) and devices (e.g. audio recorders) used for data collection; if / how the instruments(s) changed over the course of the study	7
Units of study	#12	Number and relevant characteristics of participants, documents, or events included in the study; level of	6

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		participation (could be reported in results)	
Data processing	#13	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymisation / deidentification of excerpts	7
Data analysis	#14	Process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale	7
Techniques to enhance trustworthiness	#15	Techniques to enhance trustworthiness and credibility of data analysis (e.g. member checking, audit trail, triangulation); rationale	7,8
Syntheses and interpretation	#16	Main findings (e.g. interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-14
Links to empirical data	#17	Evidence (e.g. quotes, field notes, text excerpts, photographs) to substantiate analytic findings	8-14
Intergration with prior work, implications, transferability and contribution(s) to the field	#18	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application / generalizability; identification of unique contributions(s) to scholarship in a discipline or field	14-17
Limitations	#19	Trustworthiness and limitations of findings	17
Conflicts of interest	#20	Potential sources of influence of perceived influence on study conduct and conclusions; how these were managed	18
Funding	#21	Sources of funding and other support; role of funders in data collection, interpretation and reporting	19

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Factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya: A qualitative study

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Factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya: A qualitative study

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Research question

What are the factors affecting the acceptability of isoniazid preventive therapy among health care providers in selected HIV clinics in Nairobi County, Kenya?

ABSTRACT

Objective

Despite being globally recommended as an effective intervention in tuberculosis (TB) prevention among people living with HIV (PLHIV), Isoniazid preventive therapy (IPT) implementation remains sub-optimal, especially in sub-Saharan Africa. This study explored the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya, a high HIV/TB burden country.

Design

A qualitative study was conducted using in-depth interviews with health care providers in selected HIV clinics. All conversations were audio-recorded, transcribed verbatim and analysed using a thematic approach.

Setting

The study was conducted in the HIV clinics of three purposefully selected public health care facilities in Nairobi County, Kenya between February 2017 and April 2017.

Participants

Eighteen purposefully selected health care providers (clinicians, nurses, pharmacists and counsellors) working in the HIV clinics participated in the study.

Results

Provider acceptability of IPT was influenced by factors relating to the organizational context, provider training on IPT and their percerption on its efficacy, length and clarity of IPT guidelines and standard operation procedures, as well as structural factors (policy, physical and work environment). Inadequate high-level commitment and support for the IPT programme by programme managers and policymakers were found to be the major barriers to successful IPT implementation in our study context.

Conclusion

This study provides insight into the complexity of factors affecting IPT implementation in Kenya. Ensuring optimal acceptability of IPT among health care providers will require expanded depth of engagement by policy makers and IPT programme managers with both providers and patients, as well as on-the-job design specific actions to support providers in implementation. Such high-level commitment and support is consequently essential for quality delivery of the intervention.

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Key Words: Acceptability, Isoniazid, Comprehensive care centre, health care provider, HIV/TB

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Article Summary:

Strengths and Limitations of this study

- To our knowledge, this is among the first qualitative studies exploring factors influencing the acceptability of Isoniazid Preventive Therapy among health care providers in the context of HIV clinics providing integrated HIV and TB services.
- The inclusion of both clinical and non-clinical health care providers in the study enabled the collection of information at different levels and cadres of health service provision thereby enhancing the breadth and validity of the information obtained.
- The adaptation of existing theory and literature to guide the study enabled the collection of context-specific information at different levels of the health system.
- Purposive selection of the health facilities included in the study may limit the generalisability of our findings beyond the study context. However, the conclusions and recommendations are useful and applicable in other contexts.

Introduction

Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) co-infection remain a major public health threat and challenge to health systems in many Low and Middle-income Countries (LMICs). According to the World Health Organization (WHO), people living with HIV (PLHIV) accounted for about 10% of the 10.4 million reported TB cases in 2016 (1). PLHIV are about 20 to 30 times more likely to develop active TB compared to those without HIV. Moreover, TB is the leading cause of death among PLHIV. In fact, 374 000 deaths among PLHIV in 2016 were attributed to TB (1). HIV and TB co-infection also places immense burden on health systems in LMICs and threatens global TB and HIV reduction targets (2, 3). The HIV/TB co-infection burden is heaviest in sub-Sahara Africa (1).

Kenya is one of the countries with high burden of TB, HIV/TB and multi-drug resistant TB (MDR-TB) (4). Overall TB incidence for Kenya was 169,000 in 2016 and an incidence rate of 348 per 100,000 population (1, 5). Nonetheless, Kenya has made considerable progress in reducing the HIV/TB co-infection rate which fell from 45% in 2008 to 30% in 2016 (6, 7). In 2015, approximately 31% of persons who developed TB in Kenya were HIV infected (6).

To reduce the burden of TB among people living with HIV, the WHO recommends three interventions collectively termed 'the Three I's for TB/HIV' namely: intensified TB case-finding (ICF), Isoniazid Preventive Therapy (IPT) and infection control for TB (8, 9). IPT is an evidence-based intervention with proven effectiveness of reducing the risk of TB in PLHIV by 33-62% (10). It is recommended for individuals with documented latent infection with

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Mycobacterium tuberculosis to prevent its progression into an active disease, and for PLHIV in areas with high HIV prevalence and latent TB prevalence greater than 30% (8-10). IPT involves the provision of isoniazid (INH) tablets to PLHIV who are TB negative or have latent TB. The recommended dose is 10 mg/kg daily for children and up to 300 mg/day for adults (11, 12). WHO guidelines recommend at least 6 months of IPT for children and adults including pregnant women, PLHIV and those who have successfully completed TB treatment (13). In areas of high prevalence and transmission of TB among PLHIV, IPT is conditionally recommended for 36 months as a proxy for lifelong or continuous treatment (13).

Kenya adopted the 6 month IPT regimen for eligible persons in 2012. (14). However, IPT implementation for PLHIV started in 2012 at selected facilities under the United States government supported initiative, the President's Emergency Plan For AIDS Relief (PEPFAR) (14). County-wide scale-up of IPT began in March 2015 with Siaya, Kisumu, Migori, Homa-bay and Nairobi being the pioneer Counties due to the high HIV prevalence rates in these Counties (6). The roll-out was accompanied by an ambitious country-wide target of enrolling 90% of PLHIV on IPT by December 2016 (6). Implementation is supported by various cadres of health care providers. IPT is prescribed by a registered clinician (usually clinical officers in most HIV clinics), who also assesses IPT eligibility by ruling out contraindications such as peripheral neuropathy or liver disease and recommend confirmatory laboratory tests if deemed necessary. Nurses are involved in measuring vital signs and linking new patients to care. Clinicians and nurses are also involved in intensified TB case finding procedure using a standard Ministry of Health standard ICF/IPT screening tool. They also monitor the treatment of patients that remain in care and update their IPT registers. Counsellors are involved in counselling new patients, caregivers (in the case of child patients) and patients that remain in care on the benefits of IPT to enhance adherence. Pharmacists dispense the drugs to the patients at initiation as well as during monthly re-fill visits. Social workers and community health volunteers are involved in contact tracing and linking both HIV and missing TB cases to care.

Despite the country's move to scale-up IPT, there is widespread evidence of sub-optimal implementation (6, 8, 15). The latest IPT coverage survey indicated that only 3.6% of adults and 10% children eligible were initiated into IPT in 2015 (6). While suboptimal IPT implementation is well documented, little is known about contextual factors that influence its implementation. Moreover, limited information exists on popular perceptions regarding its acceptability and factors influencing its application among health care providers in Kenya. Yet, it is widely recognised that health care providers are the front-line people delivering health care interventions and their acceptability is key to successful implementation and effectiveness of

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health care interventions (16, 17). This study responded to this gap through an in-depth analysis of the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya. Assessing IPT acceptability among health care providers can help to better understand barriers and facilitators of IPT delivery at health facilities and therefore guide TB preventive care. Acceptability is also an important outcomes measure used to assess the effectiveness of implementation and to provide insights into how this contributes to health outcomes (18, 19).

The study adopted Proctor et al's definition of acceptability as 'the perception among implementation stakeholders that a given treatment, service, practice or innovation is agreeable, palatable or satisfactory' (19).

METHODS

Study design: This was a qualitative descriptive study using semi-structured, in-depth interviews. The design, data collection, analysis and reporting were conducted in accordance with the Standards for Reporting Qualitative Research (SRQR) (20).

Study setting: The study was conducted in three facilities in Nairobi City County - one of the 47 Counties in Kenya - with a population of about 3,138,369 people between February and April 2017 (21). Nairobi County was selected because it was one of the pioneer Counties for the national rollout of IPT in 2015. The study adopted a cross-sectional approach. Three public health care facilities (for purposes of anonymity coded as Facility A, Facility B and Facility C) were purposefully selected based on physical location, size, and the high volumes of HIV and TB patients accessing integrated treatment services. Data were gathered through in-depth interviews with staff working in the HIV clinics referred to as Comprehensive Care Centres (CCCs). At the time of the study, Facility A had about 45 health personnel of different cadres supporting 10,226 HIV patients in its CCC. The facility's IPT uptake was 70% in the last quarter of 2016. An average of 1,974 patients visited the clinic per month in the last quarter of 2016. Similarly, Facility B had about 25 health care providers in the CCC, supporting 4860 patients and an IPT uptake of 68% in the last quarter of 2016. On the other hand, Facility C had about 25 health care providers in the CCC, 1,133 patients enrolled in care, 65% of whom were on IPT in the last quarter of 2016.

Study participants: The study involved eighteen health care providers – fourteen clinicians (clinical officers, nurses, and pharmacists) and four non-clinicians (counsellors) - working in the care centres of the selected health facilities. Respondents must have been involved in the IPT programme and worked in the clinic for at least six months prior to the study. Those who were absent during study period were excluded. The providers were purposefully selected to

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ensure adequate representation in terms of gender, job cadre and length of stay at the facility. All consented to participate in the study.

Sampling and recruitment: Study participants were recruited through purposive sampling. This was facilitated by the lead researcher (EW) and the head nurses of the study HIV clinics. Pre-study meetings were convened in the clinics with facility managers and clinic staff to promote the study to eligible participants. Prospective participants were approached and contact established to agree on interview logistics such as dates, times and venues.

Data collection: In-depth interviews were conducted using an interview guide patterned after the themes of the conceptual framework of factors affecting implementation outcomes by Chaudoir et al. (2013). The interviews were led by the lead researcher. The framework groups factors affecting acceptability under five main categories: structural factors, innovation characteristics, provider level factors, patient-level factors and organizational factors (Figure 1). The interviews were privately conducted in the English language within the health facilities. Each session was approximately 45 minutes long and was audio-recorded. Data were collected between February and April 2017.

Research team and reflexivity: The corresponding author (EW) is a data analyst, early career epidemiologist and implementation science researcher. EW was a graduate student and not affiliated to the sites at the time of study. This provided confidence that the data obtained from the interviews were solely the participants' perceptions and not influenced by previous contact. Other authors had no previous contact with the study sites. MA is a research scientist with interests in implementation science, health policy and systems strengthening research. EE is a health system, policy and implementation science researcher. LI is an associate professor in public health, with interests in demography and implementation science. All authors are well versed in mixed methods research approaches.

Data analysis: Audio-recorded transcripts were transcribed verbatim. Inductive thematic analysis was conducted. Data verification for accuracy and completeness was done through reading and re-reading of the interview transcripts. Coding of the transcripts was done to identify themes, messages, and patterns emerging from the data. The developed codes were matched to ensure integrity and similarity between the researchers. A codebook was developed after integration and collation of the identified codes. From the codebook, broader themes and sub-themes that emerged from the data were identified and reviewed to ensure they were appropriate for the interpretation (22). As part of a validation process and to elicit feedback from the participants, an anonymised summary of the findings was shared with randomly selected participants.

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Ethical considerations: Study approval and ethical clearance was obtained from the University of the Witwatersrand Human Research Ethics Committee (HREC) (approval No. M161164), Kenyatta National Hospital - University of Nairobi Ethics and Research Committee (approval No. P11/01/2017) and the Kenya Medical Research Institute Ethics and Research Committee (approval No. RES/7/3/1). A research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI) to conduct the study in Nairobi County, Kenya. Participants were briefed about the study and their rights and provided with an information sheet. Informed consent was obtained from all study participants prior to the interviews. Permission to access the selected health facilities was obtained from the management of the respective health facilities.

Patient and public involvement: The study aimed to address factors affecting the acceptability of IPT among health care providers, an implementation outcome which may affect the delivery of the intervention to patients. The identified factors may help improve the quality of care for PLHIV by improving the implementation of IPT. Initial findings of the broader study were shared with health care providers. Findings of this study will be shared with broader programme and scientific communities through dissemination workshops, conferences and summary fact-sheets.

RESULTS

The demographic characteristics of the eighteen health care providers who participated in the in-depth interviews are presented in Table 1.

Table 1: Demographic characteristics of health care providers who participated in in-depth interviews per health facility

Variable	Value	Facility A	Facility B	Facility C	Total
Sex	Males	5	1	1	7
	Females	3	4	4	11
Job category	Clinical officers	3	3	2	8
	Nurses	2	1	2	4
	Counsellors	2	1	1	4
	Pharmacists	1	1	-	2
Length of stay in CCC (years)	< 1	-	-	2	2
	2 – 4	1	1	-	2

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	> 4	7	5	2	14
Age (years)	≤ 30	1	2	1	4
	31 – 40	5	3	2	10
	41 – 50	1	-	-	1
	> 50	2	-	1	3

Factors affecting acceptability of IPT among health care providers

Although health care providers considered IPT to be an important intervention in the provision of care for PLHIV, they indicated several concerns with IPT at different levels that challenged their comfort and satisfaction with the intervention. The factors are grouped and presented in the following categories: structural factors, innovation characteristics, provider, patient-related factors, and organizational factors. These results are summarised in figure 2.

1. Structural factors

Structural factors relate to the wider policy environment as well as the physical and working environment of the health care providers.

Inadequate high level support for IPT implementation

Most of the providers cited limited commitment at policy level in ensuring effective implementation and streamlining of the IPT programme, which consequently demotivated providers. A majority of the providers stated that strong commitment and explicit support from the policy makers and IPT programme managers was necessary for effective implementation of the programme. Areas of support identified included advocacy for IPT, improving supply of isoniazid drugs and proper monitoring and evaluation of the IPT.

> *"…there is no initiative by those who are concerned in the TB programme. They need to make sure that they insist on IPT, and put some regulations or some rules to be followed to ensure IPT is given to every eligible patient…" (Non-clinical health care provider)*

> *"The people concerned should be more involved in the programme. We are giving IPT but they are not fully engaged. We don't get any feedback from them. They should monitor the supply of drugs and effects of IPT." (Clinical health care provider)*

Limited engagement with health care providers in the development of IPT guideline

Providers lamented that there was pressure from policymakers to implement the IPT policy guidelines during their introduction or revision at the CCCs without provider involvement.

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They noted that the consequence of this was to prescribe IPT without the full understanding its implications.

> *"We were told these are the guidelines and we should follow…before they change the guidelines we should be involved…At the moment I don't feel like we are involved in this…." (Clinical health care provider)*

Poor integration of IPT-related services

Most of the providers spoke of poor integration of IPT services in the clinic, noting that this hampered the delivery of the programme. It was noted that most of the clinical examinations required before IPT initiation were conducted in separate departments at additional costs. They felt that the examinations should be performed in the same facility and the costs subsidized to encourage uptake among patients. Most respondents felt that facility management and policymakers had a key role in supporting effective implementation of the programme

> *". ...if we do [all] the tests from here, it will take like 30 minutes to do everything and give the patient IPT. When they come again for check-ups, we can still do them again from here, and it takes less time and we get results in real time….it will even be faster for the patients" (Clinical health care provider)*

2. Innovation characteristics

Innovation factors relate to aspects of the intervention which enhance the chances of successful implementation. Discussions with health care providers revealed two main issues linked to IPT as an innovation that hampered its acceptance and implementation in their context. These are presented below.

Unclear IPT guidelines and standard operating procedures (SOPs)

Providers expressed discomfort with the IPT guidelines and SOPs citing lack of clarity. In particular, providers noted that guidelines on eligibility criteria, on how to decide whether a patient had active and latent TB and on the duration of IPT were unclear. Providers recommended a revision of the guidelines with specific regard to eligibility criteria and clarity on ruling-out active and latent TB before prescription. There was also a lack of national consensus on IPT-related services as part of the HIV/TB collaborative activities since some of the services differed among facilities. For instance, the provision of IPT with pyridoxine (to prevent peripheral neuropathy) versus IPT alone and monthly versus three-monthly drug re-fills were reported to vary from facility to facility.

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"I think it [IPT] is a good idea but the problem is with the protocol, the SOPs. They are not very clear. They are not well documented..." (Clinical health care provider)

"…They told us in the training that we should give IPT every month to the patient. We are not comfortable with it…we prefer three-month refill as we have been doing. Maybe they should re-evaluate these guidelines…" (Clinical health care provider)

Long duration of IPT

Health care providers largely expressed discomfort with the long duration of the IPT treatment regimen. They reported this to be a critical factor that influenced their delivery of the intervention mainly because of pill-burden and adverse effects reported by patients on long term therapy. Most respondents recommended a reduced duration of the drug with the help of suitable research.

"If I had a chance, I would give an IPT that would be taken once. Not the daily one for six months. That's a long time..." (Clinical health care provider)

3. Provider-related factors

Factors related to individual health care providers such as experience and knowledge of IPT and peer influence also had considerable bearing on the perception and implementation of IPT in the clinics.

Provider information and training on IPT

Both clinical and non-clinical providers indicated that they needed to be empowered on the administration of IPT through additional information and training. Some providers cited limited or no specific training on IPT administration, which limited their ability to deliver the intervention. They recommended revision of guidelines and additional training on IPT, driven by policymakers as well as regular monitoring and reporting of IPT outcomes from research to guide implementation.

"…Some of us have not been taken through training on IPT. It was just introduced and you are told, "Give IPT for this duration" ... I feel we should have been taken through training to know more about the IPT even before rolling it out." (Clinical health care provider)

"I have never attended any training. It is just what I read in school and in books. We should be included in IPT training here. It would help a lot."(Non-clinical health care provider)

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Peer influence and perceptions on IPT

The satisfaction of other health care providers with the intervention influenced their colleagues in the CCCs. Negative perceptions or doubts about the intervention by some health care providers affected the perception and delivery of IPT by the fellow providers.

> *"…Colleagues say that patients tell them "I've seen a friend of my husband who took [IPT]…", you know. So that experience with my colleagues from the patients' mouth talking…. in fact, part of it was the reason why this facility delayed as a hospital to start IPT." (clinical health care provider)*

4. Patient-related factors

Factors relating to the patients were thought to considerably affect health care providers' perceptions and delivery of IPT. The following are health care providers' reported patient-related factors affecting provider acceptability of IPT.

Non-adherence to IPT and IPT side effects on Patients

Non-adherence to IPT after initiation by patients was considered a demotivating factor in administering IPT. Non-adherence was attributed to fear of side-effects and pill burden among the patients. These views were shared by both the clinical and the non-clinical providers. Providers also reported that some patients stopped using the therapy as a result of reported side-effects. These discouraged other patients who became aware of these side-effects from enrolling on the programme. Participants expressed concern that non-adherence would eventually lead to development of resistance to isoniazid drugs in the long run resulting in MDR-TB or extensively drug-resistant TB (XDR-TB). Non-adherence was thought to be more likely among patients with poor immunological, virological and clinical state as well as those on second line anti-retroviral therapy, which made health care providers reluctant in initiating IPT to these patients. Respondents recommended considerations of patient clinical state and drug regimen and argued for these to be added to the IPT guidelines.

> *"…At least for them to do a research and find out if these side-effects are really associated with IPT. But if it is found to be safe to use, I would not have any other recommendations…Uptake reduced because they were not starting anyone else on IPT for fear of side-effects and death." (Clinical health care provider)*

Pill burden among patients

Health care providers also felt that IPT increased the pill burden among the patients which affected patients' adherence to the medication. Providers described cases where patients

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complained of the difficulty in adhering to isoniazid drugs while some completely declined to take the medication due to the high number of pills prescribed for PLHIV. As a result, providers recommended that a formulation of IPT with shorter duration for the patients.

> *"… patients feel that these drugs are so many and some say they don't want to start these drugs altogether…" (Clinical health care provider)*

> *"…if they can review the concentration now, then maybe find out the concentration that can still work and still be mild to the patients…because of the pill burden to these clients..." (Non-clinical health care provider)*

Inadequate patient information on IPT

Information about the benefits and effects of IPT was reported to be limited among the patients. This resulted in rumours and misconceptions about IPT among the patients which led some patients to refuse to be initiated or to dispose of the medication even after being counselled. Providers expressed concern over the lack of consensus and support regarding patient education activities in the CCCs for IPT.

> *"…We should conduct continuous medical education, and review how we provide patients with information …" (Non-clinical health care provider)*

> *"I think they need to do more education to the people… actually, most clients decline because they have never heard about it…they would say 'I am being treated for TB yet I don't have TB signs" (Clinical health care provider)*

5. Organizational factors

Organisational factors encompass factors related to the organizational context where IPT is implemented, in this case the CCCs. These factors affect effective implementation of IPT programmes.

Increased workload

Most clinical providers complained of the high workload in the facility, which they felt negatively affected implementation of the IPT programme. Providers reported that the limited number of clinicians did not match the high volume of patients in the CCC. The procedures to be conducted on the patient before IPT initiation were also considered very long and hence a burden to a single clinician. Providers called for hiring of staff to be dedicated to IPT related activities in the CCCs.

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"…by the time you do all the screening for conditions like hepatitis, before even convincing the patient to start IPT… it is a big workload because we have many patients waiting in line to be served." (Clinical health care provider)

"To comment about the environment and the working condition, here we have very heavy workload...then if you follow the standard operating procedures to give IPT, it will take you very long to complete all those investigations, examinations and what have you…" (Clinical health care provider)

Inconsistent Isoniazid drug supply

Providers also mentioned stock-out of Isoniazid medication and other supplies related to the IPT programme in the facilities as a major impediment to effective implementation and acceptance of the therapy. They reported stock-outs in the previous year and considered this a factor that greatly affected IPT delivery. Some providers felt that the erratic stocks and poor supply of the medications indicated lack of support for the IPT programme among policymakers and management. This, in turn, negatively affected their perception, morale and delivery of the therapy.

"…We started the programme nicely, empowering patients, counselling them on IPT, and encouraging them to take IPT… and then all of a sudden from nowhere, IPT drugs are not available" (clinical health care provider)

"My biggest challenge with the management [in CCC] is when there is erratic supply of IPT…So the patients were out of medication for some time and when you send them out to buy them; of course it's not possible for them to get the drug..." (Clinical health care provider)

DISCUSSION

This study assessed the factors associated with provider acceptability of IPT in selected clinics in Nairobi City County in Kenya. Based on an adapted framework, identified factors have been grouped into five broad categories viz. structural factors, innovation characteristics, provider, patient-related factors, and organizational factors.

Among these findings, limited high-level commitment and support for the IPT programme by higher programme managers and policymakers stood out as perhaps the biggest barrier to successful IPT implementation. Discussions with health care providers reaffirmed previous findings that supportive supervision, consistent engagement between policy makers and

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higher-level supervisors with health care providers as well as the in-depth interaction between policymakers and practitioners remain crucial for effective IPT implementation. The findings support previous evidence from similar contexts that showed that poor monitoring and lack of supervision of the IPT programme by higher managers influence IPT uptake (11, 23).

Linked to high-level commitment and support is provider involvement in the formulation of policies and guidelines. The study found limited involvement of the health care providers in the enactment and implementation of the IPT guidelines. As a result, most respondents were not comfortable implementing the guidelines in their clinics. Since only a few had received training and/or support in IPT implementation, they saw it as a challenge rather than an opportunity to improve the health of their clients. In fact, providers across all the three facilities expressed their frustrations that they were being pressured to implement and deliver an intervention whose origin or implications they knew little about. The lukewarm ownership of IPT among providers as a result of the limited engagement at design stage is not surprising and reinforces evidence in this area suggesting that successful implementation and compliance with such initiatives require mechanisms that help enforce official guidelines, address capacity gaps, and enhance provider and patient awareness (24).

Another important finding from this study is how the nature of interventions (in this case IPT) affect implementation outcomes. The lack of clarity on some of the provisions of the guidelines meant that providers struggled to fully and effectively implement IPT provisions. This in turn, negatively impacted their acceptability of the intervention. This finding resonates with evidence from other studies (23, 25), and echoes the need for a well-planned engagement process with care givers whenever such guidelines are being developed and the need to make them as simple as possible.

Better integration of IPT-related services at the clinics could significantly improve the delivery of IPT. Integration could entail incorporation of all or most of the IPT-related procedures in one room/space. This can reduce challenges such as loss-to-follow-up in TB/HIV treatment thereby assisting health care providers monitor the patients on IPT. Ultimately, this would lessen clinical provider workload. Lack of coordination between TB and HIV activities has been reported as a barrier to IPT implementation elsewhere (23). One study indicated that performing reading and interpreting tuberculin skin tests (TSTs) in the context of busy HIV clinics was a challenge for both patients and staff, negatively affecting the implementation of the IPT programme (26). In our study, providers questioned the efficacy of Kenya's IPT approach to identifying latent TB which involves a symptomatic algorithm using a standard

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Ministry of Health ICF/IPT screening tool and no Tuberculin Skin Test for IPT eligibility. Health care providers have previously called for clarity of guidelines, showing that this is a major challenge to effective implementation and acceptance of IPT (26). This may also explain the lack of awareness among some providers of the benefits of IPT in some LMIC (23). Investigation of optimal duration, safety and efficacy of IPT and its role in reducing TB risk, particularly under programme conditions has been strongly recommended by the WHO (27).

Previous studies have hypothesised that provider-level factors could predict implementation outcomes (28, 29). In our study, provider-related factors such as limited information and inadequate empowerment on IPT influenced acceptability of IPT. A general lack of knowledge and experience with IPT have also been reported as primary barriers to IPT implementation in South Africa and Ethiopia (23). It is therefore important that provider training and information is prioritised for both clinical and non-clinical providers before implementation to achieve the desired outcomes (30). Providers in our study also reported that lack of on-the-job training and support through mentorship and supportive supervision left them feeling inadequately equipped to handle emerging challenges associated with IPT implementation. These challenges highlight the need for tailor-made technical assistance during implementation including mentorship, retraining of the providers, training new staff, emotional support, and mechanisms that take into consideration the contextual challenges.

Another important determinant of IPT acceptability among providers in the study location were patient-level predictors. In our context, poor adherence and pill burden among patients were key barriers to IPT acceptance among providers and patients (as reported by providers). Previous studies have associated poor adherence to IPT with isoniazid resistance, which has made health care providers less likely to prescribe IPT (11, 31). Pill burden has also been perceived by health care providers as a cause of non-adherence causing them to be hesitant in prescribing IPT to patients with high number of pills (11, 32). Adherence to IPT treatment is a critical factor to be considered when scaling treatment services, especially in areas with high TB incidence rates. Despite poor patient adherence being a key factor affecting acceptability, there was lack of information among providers on evidence-based methods to monitor IPT adherence among patients. This might signify poor or lack of implementation of methods such as use of treatment buddies, lay health providers, community-based directly observed preventive therapy to monitor and enhance IPT adherence. The availability of resources for close monitoring, supervision and evaluation of IPT outcomes is strongly recommended by WHO (33).

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Even though we used an exploratory approach to investigate IPT acceptance among providers, the providers reporting fear of isoniazid drug-resistance among patients should be cause for concern. This is particularly so because of the gradual increase in drug-resistant TB cases in Kenya (from 112 to 1300 in 2016) (15). Policymakers, health care providers and practitioners have questioned the implications of poor IPT adherence to drug-resistant TB disease especially in the case of long course INH mono-therapy (34, 35). To improve information on IPT among patients and boost uptake, national advocacy and patient awareness is needed, among other interventions.

In the organizational context, heavy workload on health care providers and isoniazid stock-outs in the HIV clinics discouraged providers from initiating IPT, fearing poor adherence and associated side effects among their patients. Heavy workload among providers can often result in compromised quality and should be addressed as part of organisational context reforms to support IPT. In our study, this could be explained by the fact that the study clinics served a large population catchment area and not necessarily because the quality offered attracted patients to the clinics. Another reason for the heavy workload was inadequate staffing especially with regards to IPT trained staff. Ultimately, both factors affected the quality of care patients received.

The findings of this study have important policy implications. Firstly, the lack of clarity of IPT guidelines highlights a need for revision and standardization which would promote consensus among health care providers. Secondly, the findings highlight the need for strengthened monitoring and evaluation with a well-defined feedback mechanism of reporting by health care providers on IPT indicators. Finally, building both technical and logistic capacity in HIV clinics is important to improving the acceptability and ultimately the delivery of IPT.

We recommend a number of interventions to improve health care provider acceptability in the study clinics and which may be explored in other similar contexts. First, involving health care providers in IPT guideline development and revision will make them more comfortable with implementation. Secondly, better integration of all IPT-related services in the same facility may help improve patient initiation, retention and follow-up of IPT. Additionally, training and continuous mentorship on IPT implementation for both clinical and non-clinical providers should be promoted in the health facilities to improve IPT acceptability and delivery.

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Strengths and Limitations

This study, to our knowledge, is among the first to assess the factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya. The adaptation of existing theory and literature to guide the study enabled the collection of exhaustive context-specific information at different levels of the health system. The inclusion of both clinical and non-clinical personnel as key-informants in the interviews enabled the collection of information at different levels and cadres of health service provision thereby enhancing validity of the data. This study adhered to the Standards for Reporting Qualitative Research (SRQR).

Purposive selection of the health facilities may limit the generalizability of the findings from this study to other HIV clinics in Nairobi County. However, the study was context-specific and the aim was to elicit in-depth information on IPT acceptability in this context, which may inform health service provision and policy in health systems of similar context.

Finally, the study was conducted among city hospitals, which are presumably better resourced as compared to those in other locations. Therefore, the IPT programme was expected to be better managed as opposed to other non-city HIV clinics. This could contribute to better acceptability of IPT among the providers whose concerns may not entirely reflect that of health care providers in other clinics in Nairobi County. Further studies aiming for generalizability should control for the tier of health facilities in assessing IPT acceptability.

Conclusion

The study gives insight of the complexity of factors affecting IPT implementation and the value of qualitative methods and guiding frameworks to elucidate these factors. The acceptability of IPT among health care providers in this context was influenced by factors at different levels namely: structural factors, innovation characteristics, provider, patient-related factors, and organizational factors. Ensuring optimal acceptability of IPT among health care providers will require a robust engagement with both providers and patients by policy makers and IPT program managers, as well as on-the-job design specific actions to support providers in implementation. This high level commitment and support for IPT could improve provider acceptability and ultimately delivery of the intervention.

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Data sharing statement: No additional data are available.

Competing interests: The authors declare that they do not have any competing interests.

Ethics approval: Study approval and ethical clearance to conduct the research was obtained from the University of the Witwatersrand Human Research Ethics Committee (HREC) (approval No. M161164), The Kenyatta National Hospital-University of Nairobi Ethics and Research Committee (approval No. P11/01/2017) and the Kenya Medical Research Institute Ethics and Research Committee (approval No. RES/7/3/1). A research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI) to conduct the study in Nairobi County, Kenya.

Patient consent: Informed consent was obtained from all study participants prior to the interviews.

Author contributions: EW, MA, and LI contributed to the conceptualisation and design of the study including the development of the study tools. EW collected the data and did initial analysis and drafts of the manuscript. EE, MA and LI contributed to the data analysis, manuscript writing and editing. All authors read and approved the final version of the manuscript.

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Figure legends

Figure 1 Conceptual framework of factors affecting acceptability of IPT among health care providers. Adapted from Chaudoir et al. (2013)

Figure 2 Conceptual framework of factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya

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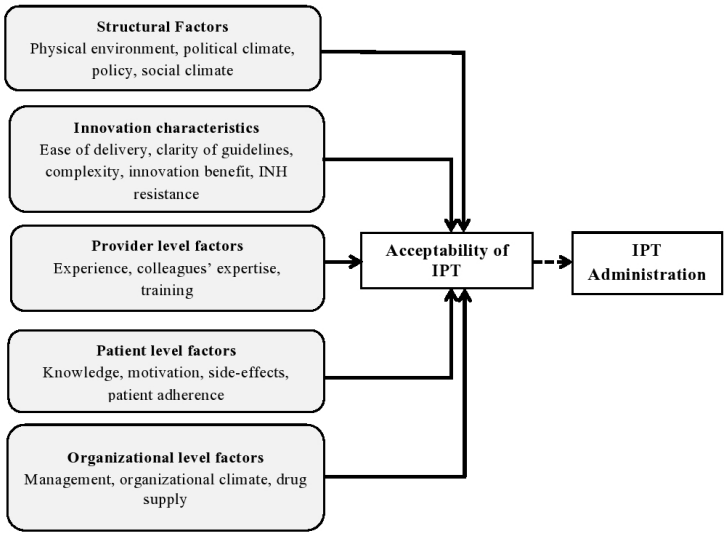

Conceptual framework of factors affecting acceptability of IPT among health care providers. Adapted from Chaudoir et al. (2013)

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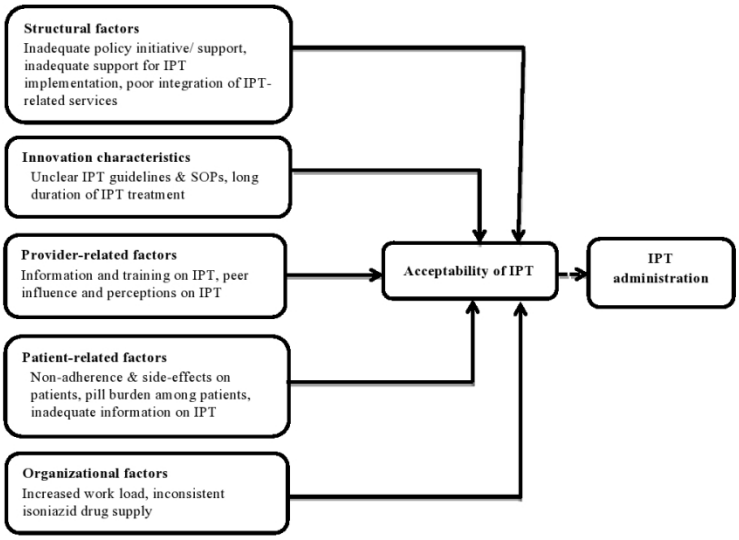

Conceptual framework of factors influencing the acceptability of IPT among health care providers in selected HIV clinics in Nairobi County, Kenya

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Reporting checklist for qualitative study.

Based on the SRQR guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

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		Reporting Item	Page Number
	#1	Concise description of the nature and topic of the study identifying the study as qualitative or indicating the approach (e.g. ethnography, grounded theory) or data collection methods (e.g. interview, focus group) is recommended	1
	#2	Summary of the key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results and conclusions	2
Problem formulation	#3	Description and signifcance of the problem / phenomenon studied: review of relevant theory and empirical work; problem statement	4,5,6
Purpose or research question	#4	Purpose of the study and specific objectives or questions	2,6
Qualitative approach and research paradigm	#5	Qualitative approach (e.g. ethnography, grounded theory, case study, phenomenolgy, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g. postpositivist, constructivist / interpretivist) is also recommended; rationale. The rationale should briefly discuss the justification for choosing that theory, approach, method or technique rather than other options available; the assumptions and limitations implicit in those choices and how those choices influence study conclusions and transferability. As appropriate the rationale for several items might be discussed together.	6
Researcher characteristics	#6	Researchers' characteristics that may influence the research, including personal	7

and reflexivity		attributes, qualifications / experience, relationship with participants, assumptions and / or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results and / or transferability	
Context	#7	Setting / site and salient contextual factors; rationale	6
Sampling strategy	#8	How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g. sampling saturation); rationale	6-7
Ethical issues pertaining to human subjects	#9	Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	8
Data collection methods	#10	Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources / methods, and modification of procedures in response to evolving study findings; rationale	7
Data collection instruments and technologies	#11	Description of instruments (e.g. interview guides, questionnaires) and devices (e.g. audio recorders) used for data collection; if / how the instruments(s) changed over the course of the study	7
Units of study	#12	Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	6
Data processing	#13	Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymisation / deidentification of excerpts	7
Data analysis	#14	Process by which inferences, themes, etc. were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale	7
Techniques to enhance trustworthiness	#15	Techniques to enhance trustworthiness and credibility of data analysis (e.g. member checking, audit trail, triangulation); rationale	7
Syntheses and interpretation	#16	Main findings (e.g. interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-14
Links to empirical data	#17	Evidence (e.g. quotes, field notes, text excerpts, photographs) to substantiate analytic findings	8-14
Intergration with prior work, implications, transferability and contribution(s) to the	#18	Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application / generalizability; identification of unique contributions(s) to	14-17

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field		scholarship in a discipline or field	
Limitations	#19	Trustworthiness and limitations of findings	18
Conflicts of interest	#20	Potential sources of influence of perceived influence on study conduct and conclusions; how these were managed	19
Funding	#21	Sources of funding and other support; role of funders in data collection, interpretation and reporting	19

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