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Afr. J. Biomed. Res. Vol. 23 (September, 2020); 367- 373

Research Article

Assessment of Tuberculosis Intensified Case Finding and Isoniazid Preventive Therapy for People Living with HIV in Enugu State, Nigeria

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ABSTRACT

Tuberculosis (TB) has remained the leading cause of morbidity and mortality among people living with HIV (PLHIV). Nigeria has the highest incidence of TB/HIV co infection and HIV associated TB deaths in sub-Saharan Africa. Therefore, TB prevention among PLHIV is of utmost necessity. We assessed tuberculosis intensified case finding (ICF) cascade and isoniazid preventive therapy (IPT) for people living with HIV in healthcare facilities in Enugu State, Nigeria. It was a cross sectional study conducted between February and May, 2019. We reviewed a total of 993 folders of PLHIV in the nine health care facilities offering ART in the State. Data was collected with ICF data collection form adapted from literature. Percentages were used to analyse data and their values compared using chi square statistic. Ninety-eight point eight per cent of PLHIV had their TB screen done and documented as at last visit to the clinic, 80% of those screened positive had documented TB diagnostic evaluation while 96.2% of PLHIV with positive TB evaluation were placed on anti-TB treatment. Furthermore, 61.2 % of PLHIV had ever received a course of IPT. Significant differences were observed in TB screening by location and IPT administration by type of health care facility ($p<.05$). Shortage of staff and poor remuneration were the most reported factors affecting implementation. The gaps identified in the implementation of ICF cascade and IPT have implications for public health and education. To reduce TB burden among PLHIV, all stakeholders must be involved in TB/HIV activities.

Keywords: *Tuberculosis, intensified case finding, isoniazid preventive therapy, people living with HIV, collaborative TB/HIV activities*

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Received: March, 2020; Accepted: August, 2020

Abstracted by:
Bioline International, African Journals online (AJOL), Index Copernicus, African Index Medicus (WHO), Excerpta medica (EMBASE), CAB Abstracts, SCOPUS, Global Health Abstracts, Asian Science Index, Index Veterinarius

INTRODUCTION

The co-occurrence of Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) have remained a leading cause of death worldwide. Tuberculosis is the leading cause of morbidity and mortality among people living with HIV (PLHIV). In 2015, there were an estimated 1.2 million new cases of TB amongst people who were HIV positive globally and 0.4 million deaths resulting from TB among PLHIV (WHO, 2016). In Nigeria, there were approximately 100,000 new cases of TB/HIV co-infection and 57,000 HIV-associated TB deaths in 2015. This placed Nigeria in the third (incidence of TB/HIV co-infection) and second (HIV-associated TB deaths) position globally respectively (Nigeria Tuberculosis Profile, 2017). In Enugu State, infections especially from HIV and AIDS and TB, alone, or as co infection and septicaemia were the most common causes of death in medical ward in a tertiary hospital in the State (Arodiwe et al., 2014). To mitigate the impact of the dual infection, the WHO policy on collaborative TB/HIV activities recommended intensified TB case finding (ICF) and isoniazide preventive therapy (IPT) as part of the activities aimed at reducing TB burden among PLHIV.

Intensified TB case finding (ICF) means actively searching for TB in people who are HIV positive. Many authors have used different names to denote ICF. These are active case finding, intensive case finding and enhanced case finding. All the above terms are synonymous with ICF and mean methods of identifying people who may be having TB but did not seek TB care on their own initiative. Such people may be seeking for services other than TB. If identified, appropriate treatment is immediately instituted to reduce spread. Traditionally in TB programme, patients present to the health facility on their own to be screened for TB. This

scenario is known as passive case finding (Bruchfield et al., 2015). According to above authors, there is no time for passive case finding in PLHIV, who are highly susceptible for TB infection and death if not treated early. Intensified Case Finding is very necessary because the risk of TB progression from latent to active is greater in PLHIV than among those without HIV infection. This also implies that PLHIV may become infectious and transmit TB on to someone else, more quickly than would otherwise happen (Kanabus, 2017).

According to WHO (2012) report, if people who are HIV positive are promptly diagnosed of TB and treated, their chances of survival and quality of life will be increased while the rate of TB transmission will be reduced both in the clinic and the community. The WHO guideline for ICF states that all PLHIV should be regularly asked whether they have any of the symptoms of current cough, fever, weight loss or night sweats at every visit to a health facility or contact with a health-care worker regardless of whether the individual is on isoniazid preventive therapy (IPT) or anti-retroviral therapy (ART) (WHO, 2011). A positive response to any one of the above symptoms suggests those that may have active TB disease therefore such people should be subjected to TB diagnostic tests to find out whether they have TB or other diseases. Treatment for TB should be commenced immediately in positive TB diagnosis while IPT should be started in people with negative TB diagnosis. The above measure (screening, diagnosis, prophylaxis and treatment initiation) is termed intensified TB case finding cascade and was investigated in this study.

Furthermore, IPT is a preventive treatment for tuberculosis. Isoniazid Preventive Therapy is a very powerful tool in preventing tuberculosis as it does not only limit advancement from latent TB infection to active TB disease but also protects against re-infection with TB germ when exposed to the tubercule bacilli (Government of India, 2016). The WHO policy on collaborative TB/HIV activities recommended the exclusion of active TB through proper screening and diagnostic investigation before IPT is started. Isoniazid Preventive Therapy is administered only to those PLHIV who reported none of the symptoms of cough, fever, weight loss and night sweats. It is given daily for at least six months as part of care and support for all eligible PLHIV (those without active TB disease) not considering the individuals' immune status, previous treatment of TB, ART use and pregnancy (WHO, 2012). IPT has been shown to be very efficacious in preventing TB among PLHIV. Abasie and Yohanes (2016) reported that apart from prompt commencement of ART in PLHIV, IPT is the major means to prevent TB in PLHIV.

Undiagnosed TB among PLHIV is increasing unprecedentedly in sub-Saharan Africa and other developing nations. Studies have revealed that there are high rates of undiagnosed TB among PLHIV and HIV-negative individuals (Kassa et al. 2012; Pasipamire et al. 2016; Galeto, et al. 2017). Despite the collaborative TB/HIV activities in health care facilities, co - morbidity of TB/HIV has continued to be a leading cause of morbidity and mortality among PLHIV in Nigeria, Enugu State inclusive. Both TB and HIV programmes have been in existence in the State right from when the programmes started in Nigeria. However, collaborative TB/HIV activities commenced in January 2013 after the revision of the guideline for the implementation in 2012 (Daniel et al., 2015). There are limited studies on tuberculosis ICF and IPT in Nigeria more so in Enugu State. It therefore became necessary to investigate tuberculosis ICF and IPT which are aimed at reducing TB infection for PLHIV. The purpose of the study was to assess the implementation of ICF and IPT for PLHIV in health care facilities offering anti-retroviral therapy in Enugu state, Nigeria.

MATERIALS AND METHODS

We employed cross-sectional survey research design and carried out the study in Enugu State, southeast Nigeria. The State is almost located at the centre of Nigeria and serves as nodal State linking Eastern Nigeria with Northern Nigeria. As at 2006 census Enugu State has a population of about 3.3 million with an annual growth rate of 3.18 per cent. It was projected from the 2006 census that the State will have a population of 4.7 million by the end of 2020 (Enugu State Vision 4:2020, 2010). Health care system in the State is organized according to the National Health Care policy (primary, secondary & tertiary). HIV comprehensive care and treatment including ART are provided at the general hospitals as well as teaching hospitals which represent the secondary and tertiary levels. The primary level health care facilities provide some HIV services like HIV testing and counseling, prevention of mother to child transmission (PMTCT) of HIV, but do not provide the comprehensive care and support like the secondary and tertiary levels of care. There are also several private and mission health care facilities situated throughout the state that also provides health care services including HIV care for PLHIV. Despite these services, there appears to be increase in the prevalence of TB among PLHIV in the State. This is reflected in the NSP-TB 2015-2020 report that Enugu State is among the first 21 States in Nigeria that account for 71 per cent of estimated gap in TB case notification (National Strategic Plan for Tuberculosis Control (NSP-TB), 2015-2020). Furthermore, studies have shown that infections from TB and HIV either alone or as co infection were the commonest causes of mortality in the State (Arodiwe et al. 2014; Alau et al. 2016). Hence, data on implementation of ICF and IPT in the State as aspects of collaborative TB/HIV activities will yield data for country profile in the WHO assessment of the policy globally.

Population and sample: The population for the study comprised all 9,958 PLHIV (adults aged 15 years & above) accessing ART services at the nine ART centres in Enugu State-owned health care facilities as at December, 2018; and 1,067 health care workers (HCWs) at the designated centres (220 HCWs in the eight secondary health facilities & 847 HCWs in the tertiary facility). The sample size for this study consisted of 993 PLHIV and 207 HCWs. We drew the sample from PLHIV based on Cohen, Manion, and Morrison standardized table for sample size determination (Cohen et al. 2011). From the table, a population of about 10,000 at 95 per cent confidence level and 5 per cent confidence interval should have a minimum sample of 370 or above. However,

this sample was increased to 993 to ensure representativeness of the entire population for the study and was drawn from the nine health care facilities studied. The sample represented approximately 10 per cent of total population of PLHIV and was drawn using a two-stage sampling procedure. We utilized proportionate sampling technique in the first stage to select the number of PLHIV in each facility according to its patient load. Approximately ten per cent of PLHIV currently on ART at the time of the study were selected from each facility. In the second stage, we used simple random sampling technique to select the number of folders of PLHIV currently on ART required from each of the nine facilities. At the end of the procedure, we reviewed a total of 993 folders of PLHIV. In addition, proportionate sampling method was used to draw a sample of 291 HCWs representing 27.3% of the population of HCWs from the health facilities studied (60 HCWs from secondary facilities and 231 HCWs from the tertiary health care facility). However, 207 were used for analysis due to poor return rate.

Data collection and analysis: We utilized ICF data collection form which was adapted from literature to collect data (Pasipamire *et al*, 2016). Data were collected between February and May, 2019. The data collection form consisted of facility characteristics, PLHIV characteristics and the indicators of ICF and IPT (Additional file 1). The indicators were: TB screen done, TB screen result, diagnostic evaluation done, result of diagnostic evaluation, TB treatment started and ever received a course of IPT. These information were gotten from folders of PLHIV in the facilities. We carried out a retrospective review of records of sampled PLHIV currently accessing care to identify the implementation of ICF and IPT using the ICF data collection form. The ICF was considered implemented if TB screen was done and documented during the last visit of the PLHIV to the facility. Those PLHIV that had TB screen result positive were traced to the TB unit to find out whether TB diagnostic evaluation was done, the result of the evaluation and TB treatment initiation for those with positive TB evaluation result. Hence, we collected data on TB screen done, TB screen result and ever received a course of IPT from folders of PLHIV in ART clinic while we collected data on diagnostic evaluation done, result of evaluation and TB treatment started from presumptive TB register and TB treatment register in the TB unit of the facility. Data from the health care workers were collected with a researcher made checklist on factors affecting implementation of ICF and IPT. The HCWs were asked to tick yes or no as it applied to them (Additional file 1). Data were cleaned and coded using SPSS version 22. We utilized WHO indicators to determine the proportions of ICF and IPT for PLHIV (Additional file 2) while we utilized chi square statistic to compare implementation across facility characteristics of location and type at .05 level of significance. A p-value of less than .05 was considered significant.

Ethical approval: Ethical approval for this study was granted by the research ethics committee of Enugu State ministry of health (MH/MSD/REC19/050) (Additional file 3).

RESULTS

Majority of the participants were females (70.6%) and aged between 25 and 49 years (72.7%). Also, greater proportion of PLHIV studied were from secondary (86.9%) and rural (65.2%) health care facilities respectively. Table 1 shows characteristics of PLHIV studied.

Table 1:
Characteristics of PLHIV Included in the Study (n=993)

Characteristic		f	%
Gender	Male	292	29.4
	Female	701	70.6
Age (years)	15-24	51	5.1
	25-49	722	72.7
	50& above	220	22.2
Location of health facility	Urban	346	34.8
	Rural	647	65.2
Type of health facility	Secondary	863	86.9
	Tertiary	130	13.1

Intensified TB case finding cascade for PLHIV in health care facilities: Table 2 showed that out of 993 PLHIV studied, 981(98.8%) had their TB screen done and documented as at last visit to the clinic. Out of these, 95(9.7%) were screened positive for TB. Seventy-six (80%) of those screened positives had documented TB diagnostic evaluation done of which 26(34.2%) had positive TB evaluation result. In addition, 25(96.2%) of PLHIV with positive TB evaluation were placed on anti-TB treatment.

Table 2:
Intensified TB case finding cascade for PLHIV in health care facilities in Enugu State (n=993)

ICF cascade steps	Yes f (%)	No f (%)	Total f (%)
1. TB screen done as at last visit to the clinic	981 (98.8)	12 (1.2)	993 (100)
2. Positive TB screen result	95 (9.7)	886 (90.3)	981 (100)
3. TB diagnostic evaluation done	76 (80)	19 (20)	95 (100)
4. Positive TB diagnostic evaluation	26 (34.2)	50 (65.8)	76 (100)
5. Positive TB diagnosis started on anti-TB treatment	25 (96.2)	1 (3.8)	26 (100)

The gaps in TB screening (1.2%), TB diagnostic evaluation (20%), and in starting anti TB treatment (3.8%) are shown in figures 1a-c.

Table 3 showed that higher proportion of PLHIV were screened for TB in rural facility (99.8%) than urban facility (96.8%) with significant difference in proportion of PLHIV screened for TB based on location ($p<.05$). Furthermore, higher proportion of PLHIV had their TB diagnostic evaluation and TB treatment started in urban facilities (88.9% & 100%) than the rural facilities (74.6% & 91.7%) respectively. More so, table 3 showed that 100 per cent of PLHIV in tertiary facility had their TB screen done at last visit and those with positive TB diagnosis started on anti TB treatment against 98.6 per cent and 95.2 per cent in secondary facility respectively. No significant difference existed in screening based on facility type ($p > .05$). However, slightly higher proportion of PLHIV in secondary facility (80.3%) than in tertiary facility (78.9%) had TB diagnostic evaluation done.

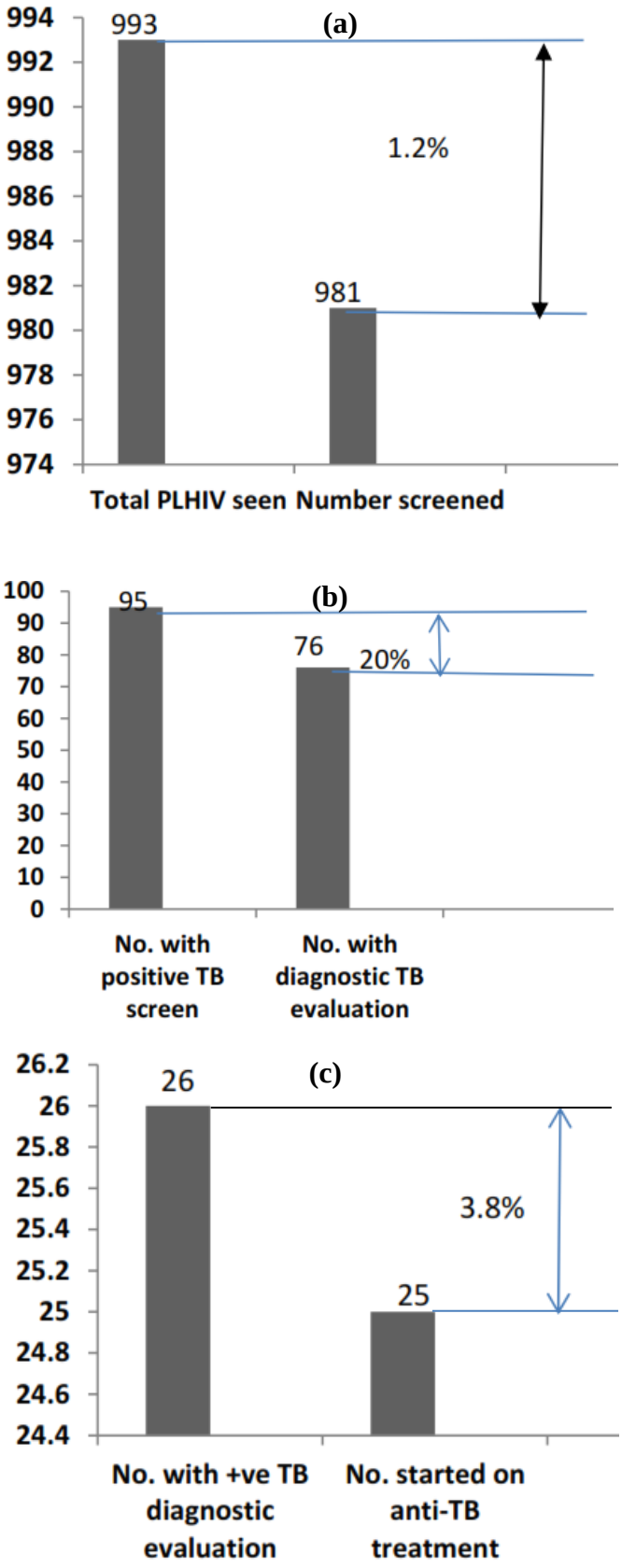

Figure 1:
Gaps in (a) TB Screening; (b) Diagnostic Evaluation and (c) Starting Anti-TB Treatment

Table 3:
Intensified TB case finding cascade according to facility characteristics (n=993).

Facility Characteristics	ICF Cascade Steps				
	TB screen done F(%)	+ve TB screen result F(%)	TB diagnostic evaluation done F(%)	+ve TB diagnostic evaluation result F(%)	+ve diagnosis started on a TB drug F(%)
Location of health care facility					
Urban	335 (96.8)	36 (10.7)	32 (88.9)	14 (43.8)	14 (100)
Rural	646 (99.8)	59 (9.1)	44 (74.6)	12 (27.3)	11 (91.7)
Total	981 (98.8)	95 (9.7)	76 (80)	26 (34.2)	25 (96.2)
		χ^2 (*p* value) 17.275 (.000)*			
Type of health care facility					
Secondary	851 (98.6)	76 (8.9)	61 (80.3)	21 (34.4)	20 (95.2)
Tertiary	130 (100)	19 (14.6	15 (78.9)	5 (33.3)	5 (100)
Total	981 (98.8)	95 (9.7)	76 (80)	26 (34.2)	25 (96.2)
		χ^2 (*p* value) 1.830 (.176)			

**significant at p<.05*

Intermittent preventive therapy for PLHIV in health care facilities: Table 4 showed that out of the 993 PLHIV studied, 608(61.2%) had ever received a course of IPT in the health care facilities while 385(38.8%) had never received a course of IPT.

Table 5 showed that slightly higher proportion of PLHIV in the rural facilities (62.1%) than urban facilities (59.5%) had ever received a course of IPT though this difference is not significant ($p > .05$). Also in table 5, higher proportion of PLHIV in the tertiary health care facilities (72.3%) than the secondary health care facilities (59.6%) had ever received a course of IPT. This difference is significant ($p < .05$).

Table 4:
Proportion of PLHIV offered TB Isoniazid Preventive Therapy (IPT) (n=993)

Ever received a course of IPT	f (%)
Yes	608 (61.2)
No	385 (38.8)
Total	993 (100)

Table 6 shows that the most reported factors affecting implementation of ICF and IPT were shortage of staff (87.0%) and poor remuneration (78.7%). Others included too much workload and lack of necessary equipment and supplies (75.8% each) respectively and no incentive (72.5%). About 64.3 per cent of health care workers reported lack of knowledge while the least reported factor was lack of adequate supervision (61.4%).

Table 5:
Isoniazid preventive therapy (IPT) for PLHIV in Enugu State (n=993)

Ever received a course of IPT	Urban f (%)	rural	χ^2	*p*	Secondary	Tertiary	χ^2	*p*
Yes	206 (59.5)	402 (62.1)			514 (59.6)	94 (72.3)		
No	140(40.5)	245 (37.9)	0.640	.424	349 (40.4)	36 (27.7)	7.734	.005*
Total	346 (34.8)	647 (65.2)			863 (86.9)	130 (13.1)		

**significant at p<.05*

Table 6:
Factors that Affect the Implementation of ICF and IPT in Health Care Facilities (n=207)

Factors	Yes f (%)	No f (%)
Lack of knowledge of collaborative TB/HIV activities	133 (64.3)	74 (35.7)
Shortage of staff	180 (87.0)	27 (13.0)
Poor remuneration	163 (78.7)	44 (21.3)
No incentive	150 (72.5)	57 (27.5)
Lack of adequate supervision	127 (61.4)	80 (38.6)
Too much workload	157 (75.8)	50 (24.2)
Lack of necessary equipment and supplies	157 (75.8)	50 (75.8)

DISCUSSION

We reviewed a total of 993 folders of PLHIV in ART clinics in Enugu state. Majority of the PLHIV whose folders were reviewed were females, aged between 25 and 49 years, from secondary and rural health care facilities. Findings were that 981(98.8%) of PLHIV had their TB screen done and documented as at last visit to the clinic (Table 2). This finding leaves a gap of 1.2 per cent for TB screening (Figure 1a). This gap, even though looks small but it is significant. The finding however shows remarkable improvement in implementation of intensified case finding. This percentage is higher than those in previous studies in different parts of the world. Previous studies showed 97 per cent in Swazilland (Pasipamire et al, 2016), 75.2 per cent in Harari, Eastern Ethiopia (Galeto et al. 2017), 92.8 per cent in Addis Ababa, Ethiopia (Denegetu & Dolamo 2014) and 98 per cent in Nepal, India (Sah et al. 2016). Never the less, much still need to be done to close the gap of 1.2 per cent created in TB screening. This is very necessary because symptomatic screening for TB helps a lot in identifying subset of PLHIV likely to be infected with TB and when this is done, prompt measures are initiated to curb TB spread among PLHIV and the general public. It has been earlier noted that ICF is very necessary because, the risk of progressing from latent to active TB is greater in people living with HIV than among those without HIV infection. This also means that they may become infectious and pass TB on to someone else, more quickly than would otherwise happen (Kanabus, 2017). Significant difference existed in the proportion of PLHIV with documented TB screening in rural versus urban facilities (p <.05) with higher proportion of PLHIV in rural health facilities having documented TB screening. This could be a pointer to the activities of urban and rural health care facilities in Enugu State. It seems that health care workers in rural health care facilities carry out their duties more efficiently than health care workers in the urban health care facilities. The possible reason for the difference need to be explored in future research.

Furthermore, results in Table 2 showed that 76 (80%) of those screened positive had documented TB diagnostic evaluation while 25 (96.2%) of PLHIV with positive TB evaluation were placed on anti-TB treatment. These leave gaps of 20 per cent in TB diagnostic evaluation and 3.8 per cent in commencement of anti TB treatment for those with positive TB evaluation (Figures 1b & c). The gap of 20 per cent in TB diagnostic evaluation is not acceptable in TB control. The second step in intensified TB case finding cascade is that all PLHIV that screened positive should be subjected to TB diagnostic evaluation. The aim of the screening will be defeated if some of the PLHIV that screened positive are not subjected to diagnostic evaluation. Diagnostic evaluation for TB will help to identify those needing TB treatment and those that should be offered isoniazid preventive therapy. Also, the gap of 3.8 per cent in commencement of anti TB treatment for those with positive TB evaluation is not encouraging. The final step in the ICF cascade is starting of treatment for PLHIV diagnosed with TB. In Swazilland, the gap in TB diagnostic evaluation was 46 per cent (Pasipamire et al, 2016), in Nepal, the gap in commencement of anti TB treatment was 32 per cent (Sah et al, 2016). Therefore, the finding of this study is relatively better in the implementation of the cascade steps when compared to other studies. However, there is need for improvement to close the identified gaps in order to contribute to the achievement of the objective of reducing TB burden among PLHIV.

In addition, results showed that 608 (61.2%) PLHIV had ever received a course of IPT in the health care facilities while 385 (38.8%) had never received such (Table 4). The percentage found in this study is lower than in other recent studies. There has been improvement in IPT administration in recent times. In Ethiopia, 78.7 per cent of PLHIV were offered IPT (Galeto et al, 2017) whereas, 81 per cent received IPT in Zimbabwe (Takarinda et al, 2017). IPT administration is among the cascade steps given to subset of PLHIV who do not have active TB and has been shown to be very efficacious in preventing TB among PLHIV. The lower proportion of PLHIV receiving IPT in this study compared to other recent studies is a thing of great concern that needs to be explored further. Significant difference existed in the proportion of PLHIV that had ever received a course of IPT in secondary and tertiary health care facilities (p<.05) with higher proportion receiving care in the tertiary health care facility (Tables 5). Isoniazid administration in secondary health care facility need to be boosted to ensure proper coverage of IPT among PLHIV in Enugu State.

Furthermore, more than three quarters of health care workers reported shortage of staff (87.0%), poor remuneration (78.7%), too much workload and lack of necessary equipment and supplies (75.8% each) respectively as factors affecting implementation of ICF and IPT. More than half are of the view that no incentive (72.5%), lack of knowledge (64. %) and lack of adequate supervision (61.4%) affect their work. These findings are consistent with other findings. For instance, Nansera et al. (2010) reported understaffing and lack of knowledge and skills among health care workers as barriers to provision of integrated TB/HIV services, Okello (2016) showed that staff attitude, irregular supply of ICF related materials, high workload were the barriers to implementation of ICF in Uganda. In Lagos state, Kuyinu et al. (2016) found the barriers to implementation of infection control as weak managerial support, poor funding, understaffing and lack of space. Inadequate infrastructure and staffing are the main challenges that play against the successful integration of TB and HIV services in resource-constrained Republic of Congo (Linguissi et al., 2017). These factors could be responsible for the gaps in ICF and IPT observed in this study. The identified barriers need to be urgently tackled by appropriate bodies in order to boost implementation of ICF and IPT for achievement of TB elimination among PLHIV and the general public.

In conclusion, there were gaps identified in the implementation of ICF cascade and IPT. These gaps have implications for public health and education. Studies have shown that people living with HIV are ten times more likely to contract TB than people without HIV. The identified gaps mean that there are loopholes in implementation giving PLHIV more opportunity to contract TB. High TB incidence among PLHIV is an indicator of poor health in the community. Therefore, public health educators, health care workers, community members and other health professionals should all cooperate to ensure proper implementation of ICF and IPT in health care facilities. Governmental and nongovernmental organizations responsible for staffing, remuneration and resource allocation should do the needful to ensure proper implementation of ICF and IPT for PLHIV. People living with HIV themselves need to be properly educated on the importance of TB screening at each visit to the facility and proper IPT administration so that they will remind the health care workers if they tend to forget the steps. Educating PLHIV and community members will go a long way in reducing TB burden among PLHIV in the community. In addition, a qualitative study has been planned to further explore the reasons for the identified gaps and differences in implementation across facility characteristics observed in this study.

Acknowledgements

The authors are grateful to the State Ministry of Health, Enugu for granting the ethical permission to carry out this study. We also acknowledge all the Chief Medical Directors of the health care facilities we studied for granting us access to their records. We also thank the health care workers in the facilities for the assistance rendered to us during the data collection period..

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