RESEARCH REPORT

Prevalence and correlates of tobacco smoking among prisoners at Kamfinsa correctional facility, Kitwe, Zambia

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Smoking tobacco is an integral part of prison life. Although, tobacco consumption is a major risk factor for mortality, little has been done to prevent smoking in prisons. There is a high prevalence of tobacco use in prisons, which may be associated with several factors such as stress, anxiety about the case and sentence etc. In Zambia, the prevalence of tobacco consumption has increased over the past decade from 13.7% to 23.8% among men and 0.5% to 0.7% among women (7). Hence, the aim of the study was to determine the prevalence and correlates of smoking among prisoners at Kamfinsa Prison in order to assess the magnitude of the problem and identify possible targets for interventions.

The study used a modified WHO STEPwise approach for chronic disease risk factors surveillance with a target sample size of 384 with 89.3% males. Overall, 50.8% of the participants reported using some form of tobacco in the past six months (cigarettes 46.9%, pipe 0.3%, smokeless tobacco [snuff] 3.6%). Among men, 51.6% reported using tobacco and among women, 43.9% reported using tobacco. Among male tobacco users, 99.4% smoked cigarettes, whereas among female tobacco users, only 22.2% smoked cigarettes. Males were 16 (95% CI [5.1-53.0]) times more likely to smoke compared with females, and participants who knew that second hand smoke is harmful were 3.4 (95% CI [1.1-10.0]) times more likely to smoke than those who didn't know. Prevalence of cigarette smoking is high among prisoners at Kamfinsa correctional facility. There is a need for additional studies in this area to inform efforts targeted at preventing smoking in prisons.

Introduction

Universally, tobacco consumption is a major risk factor for mortality [28] with an estimate of five million people killed yearly worldwide [4]. Smoking is generally known to cause death from cancer, cardiovascular diseases, and respiratory conditions [3]. The World Health Organization (WHO) reports that smoking is the second leading cause of death not only in developed countries but also in developing nations [5]. This is because tobacco smoking is increasing in developing countries [6], and Zambia is no exception, as the prevalence of smoking has increased over the past decade from 13.7% to 23.8% among men and 0.5% to 0.7% among women [7].

Tobacco is a psychotropic substance widely used by prisoners; reported rates of use range from 64 to over 90% depending on the country and the setting [8]. The factors that prompt cigarette smoking within prisons are several: boredom, lack of freedom, lack of activities, the missing of family and friends, long hours indoors, also anxiety about the case and sentence, and prevalence of stress was 77% in Poland [2] [9], [10].

A study in India reported a prevalence of tobacco smoking among the prisoners of 93% [1]. In addition, a study in Poland showed a prevalence of cigarette smoking among Polish prisoners of 81% [2].

In Zambia the prevalence of tobacco smoking has increased [7]. Studies from two big cities; Kitwe and

Table 1 Distribution of age by gender for the sampled population

Factor		Total n (%)	Male n (%)	Female n (%)	P Value
Age (yrs)	**<30**	136 (35.5)	119 (34.8)	17 (41.5)	0.40
	30+	247 (64.5)	223 (65.2)	24 (58.5)	

Table 2 Tobacco use stratified by gender

Factor	Total	Male	Female	P values
	n (%)	**n (%)**	**n (%)**	
Tobacco Use				0.35
Yes	195 (50.8)	177 (51.6)	18 (43.9)	
No	189 (49.2)	166 (48.4)	23 (56.1)	

Table 3 Attitudes towards tobacco use among the sampled population

Factor		Total n (%)	Male n (%)	Female n (%)	P Value
Worries	**Yes**	106(54.6)	97(55.1)	9(50.0)	0.81
	No	88(45.4)	79(44.9)	9(50.0)	
Relax	**Yes**	105(53.8)	97(54.8)	8(44.4)	0.40
	No	90(46.2)	80(45.2)	10(55.6)	
Stress	**Yes**	126(64.9)	120(68.2)	6(33.3)	0.003
	No	68(35.1)	56(31.8)	12(66.7)	
Enjoyable	**Yes**	122(62.6)	112(63.3)	10(55.6)	0.52
	No	73(37.4)	65(36.7)	8(44.4)	
Tough	**Yes**	72(36.9)	66(37.3)	6(33.3)	0.74
	No	123(63.1)	111(62.7)	12(66.7)	

Table 4 Frequency of cigarette smoking

Factor		Frequency
Cigarette Smoking index	10 or fewer	71.3%
	11 to 20	15.5%
	21 to 30	7.2%
	31 or more	6.1%
	31 or more	2.9
When started smoking	Before imprisonment	169(86.7%)
	After imprisonment	26(13.3%)
How often smoked	Rarely	23(11.8%)
	Occasionally	39(20.0%)
	Daily	133(68.2%)
Smoking inside the cell	Yes	9(4.6%)
	No	185(94.9%)

Lusaka, have shown an increase in tobacco smoking, with Kitwe city having a prevalence of 8.7% overall (18.1% among males and 1.8% among females), and with the capital with an overall prevalence of 6.8% (17.5% among males and 1.5% among females) [11]. These findings were in the general population, but there is also a need to conduct similar studies in prisons because the worldwide findings on tobacco smoking are that prevalence rates are higher among prisoners than the general population and are increasing [8, 12]. This is because prisoners use tobacco due to its biological effects such as feelings of well-being and reduced anxiety, depression, and stress [13]. But the continual use of tobacco by prisoners has been reported to contribute to violence, antisocial personality disorder, psychotic illness [14] and increased effects of licit and illicit drug use [15]. This may disturb the prison atmosphere. Hence, tobacco use is contrary to the motto of the Zambian prisons, "Correction to service" i.e., to provide quality correctional services.

Zambia has a population of 13 884 000, and the prevalence of tobacco use among male youths is 24.9%, female youths 25.8, and among adult males 24.3% and adult females 1.8% [17]. Zambia has listed public places with smoke-free legislation and nothing is said about prison areas. Yet, in May 2008, Zambia issued statutory Instrument #39, 2008 [18], making all public places smoke-free, "public place" means any building, premises, conveyance or other place to which the public has access. "Many jurisdictions worldwide have implemented smoke-free laws that apply to indoor public places and workplaces", [5]. However, prisons are often exempt. "Prisons are public places, workplaces both for prisoners and prison staff and homes of the inmates". Therefore, all smoke-free policies and action taken to lessen the exposure to environmental tobacco smoke should also take these areas into account, [16].

Prisoners need good public health as much as the general population needs it. Good prison health is good public health [19].

Table 5 Bivariate analysis of Factors associated with tobacco smoking

Factor		Tobacco smoking			P Value
		Total n (%)	YES n (%)	NO n (%)	
Sex	**Male**	343(89.3)	176(97.8)	167(81.9)	<0.01
	Female	41(10.7)	4(2.2)	37(18.1)	
Age (years)	**<30**	136(35.5)	71(39.4)	65(32.0)	0.13
	30+	247(64.5)	109(60.6)	138(68.0)	
Worries	**Yes**	106(54.6)	99(55.3)	7(46.7)	0.52
	No	88(45.4)	80(44.7)	8(53.3)	
Relax	**Ye**	105(53.8)	100(55.6)	5(33.3)	0.10
	No	90(46.2)	80(44.4)	10(66.7)	
Stress	**Yes**	126(64.9)	122(68.2)	4(26.7)	<0.01
	No	68(35.1)	57(31.8)	11(73.3)	
Enjoyable	**Yes**	122(62.6)	115(63.9)	7(46.7)	0.19
	No	73(37.4)	65(36.1)	8(53.3)	
Knowledge of harm on active smoking	**Yes**	171(87.7)	159(88.3)	12(80.0)	0.40
	No	24(12.3)	21(11.7)	3(20.0)	
Knowledge of harm on passive smoking	**Yes**	159(81.5)	157(87.2)	2(13.3)	<0.01
	No	36(18.5)	23(12.8)	13(86.7)	

Hence, the objective of the study was to determine the prevalence and correlates of tobacco smoking among prisoners at Kamfinsa State correctional facility in order to assess the magnitude of the problem and identify possible targets for interventions.

Table 6 Factors associated with tobacco smoking. Adjusted odds ratios

Factor		AOR (95% C.I.)
Knowledge of harm	Yes	3.4 (1.1-10.0)
about passive smoking	No	1
Sex	Male	16.4 (5.6-53.0)
	Female	1

Methods

A cross sectional study was conducted at Kamfinsa state correctional facility. The study used a modified WHO STEPwise approach for chronic diseases risk factor surveillance [29] giving a sample size of 384 prisoners.

Kamfinsa state correctional facility was strategically picked as the site of the study because it is the largest correctional facility in Copperbelt Province having both male and female wings and inmates are from different parts of the country. A systematic sampling technique was used to select participants, as all elements had the same probability of selection. Sampling was irrespective of sex.

A structured questionnaire was used to collect data. The questionnaire was divided into the following sections: tobacco use, pattern and forms, smoking environment, source and accessibility of tobacco, attitudes towards tobacco use, and knowledge of adverse health effects. The questionnaire was self-administered under guidance of the officer in charge.

Data was entered in Epi Info version 7.0. Then the validated data were analysed using SPSS version 20. The analysis included running frequencies, cross-tabulations, bivariate analysis, and logistic regression. We also obtained adjusted odds ratios (AOR) and their 95% CIs after considering only the factors in the model that were significantly associated with the outcome in the bivariate analyses.

The research proposal was reviewed and approved by Tropical Disease Research Center Ethics Committee at Ndola Teaching Hospital. Authorization was obtained from the headquarters of Zambia prisons service in Kabwe. Only persons who consented were enrolled into the study and further information was given to participants after consenting that participating in the study was purely voluntary and participants were free to withdraw at any time without having to give an explanation. All questionnaires were strictly confidential documents. No one, except those who organized the research, was able to view the documents.

Results

Demographics

A total of 384 individuals participated in the survey, of which 89.3% were males. Age was not associated with gender (p=0.40) as shown in Table 1.

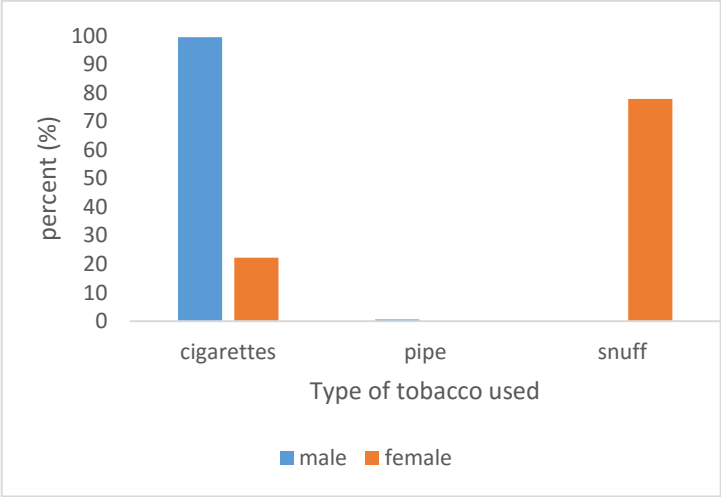

Figure 1 Types of tobacco used by gender among persons reporting tobacco use

Tobacco Use Prevalence

Overall, (Table 2) 50.8% (cigarettes 46.9%, pipe 0.3%, smokeless tobacco [snuff] 3.6%) of the participants reported using some form of tobacco with no gender difference (51.6% among males, and 43.9% among females; p=0.35). Among tobacco users, current use of cigarettes was estimated at 92.3%, and 7.2% used smokeless tobacco, and 0.5% used a pipe. Males tended to smoke cigarettes

while females used snuff (Figure 1). However, further analysis is based on cigarette smoking. Among those who smoked cigarettes (Table 4), most (71.3%) smoked fewer than 11 cigarettes per day; 86.7% started smoking before imprisonment; 68.2% were daily smokers, and only 4.6% smoked inside the cell.

Males and females had similar attitudes towards tobacco use (Table 3) except for stress; more males than females indicated that smokers are often stressed ($p<0.01$).

In bivariate analysis (Table 5), gender, knowledge that passive smoking is harmful, and stress were significantly associated with tobacco smoking.

Correlates for Current Tobacco Smoking

Independent factors associated with smoking were gender and knowledge about second hand smoking (SHS) effects (Table 6). Male respondents were 16.4 times more likely to smoke compared with female respondents. Comparing with respondents who didn't have knowledge about passive smoking, those who had knowledge were 3.4 times more likely to smoke.

Discussion

We found a current smoking prevalence of 50.8% (51.6% among males and 43.9% among females) i.e. 46.9% smoked cigarettes, 0.3% pipe and 3.6% used smokeless tobacco (snuff). Comparing our finding with those from the general population [11] that used the same WHO STEPwise approach for chronic disease risk factor surveillance, we note that our findings were higher than those from Kitwe (8.7% overall, 18.1% males, 1.8% females), and Lusaka (6.8% overall,17.5% males, 1.5% females). The findings are in conformity with the worldwide findings on tobacco smoking that the prevalence rates are higher among prisoners than the general population [8], [12].

The current study also found that the prevalence of smoking was higher among males than females. Such results have been reported in the United States [20], [21], Greece [22], France [23] and Italy [24]. Though, scanty data are available for the prevalence of smoking among women in prisons, a study in Australian prisons reported a high prevalence of smoking among females [13]. Values are similarly high in the United Kingdom [25], and Lithuania [26]. Interestingly, our study further found that, women used much more snuff (smokeless tobacco) than cigarettes.

We also found that males were 16.4 times more likely to smoke cigarettes than females, and those who knew about the harmful effects of passive smoke were 3.4 times more likely to smoke than those who had no knowledge of SHS effects. There is a high prevalence of exposure to SHS inside prisons, which is two to four times higher or to magnitudes that tally with the proportion of non-smokers outside prison [27].

This study has several limitations. The study was done at Kamfinsa State correctional facility; hence, the results can only be generalized to the sampled population. Furthermore, the study didn't probe on why women use snuff more than cigarettes in prisons. Factors associated with women using snuff were not determined in this study. In addition, because of the small number of female respondents [41], the confidence limits for the proportions of women who used various types of tobacco products and for the proportions of women with various attitudes toward tobacco use are large.

The prevalence could have been underestimated due to the following factors. The sample selection was purposive which does not eliminate selection bias. It was noted that prisoners who were incarcerated because of trading tobacco refused to take part in the study, and these were likely to be smokers. Therefore, the prevalence of smokers could have been underestimated.

Conclusion

Prevalence of tobacco use is high at Kamfinsa State correctional facility, especially among males. Considering

the emerging threat of non-communicable disease burden, the government of Zambia should seriously consider strict enforcement of tobacco control in state correctional facilities. Further research on epidemiology of tobacco use and monitoring of its use in prisons might help in curbing smoking.

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