Co-occurrence between Alcohol Use and Tuberculosis among Patients in Othaya Level 4 Hospital

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Abstract

Although the government and partners have made significant investments in Tuberculosis (TB) prevention and treatment over the last 20 years, tuberculosis remains the fourth leading cause of death in Kenya. Alcohol intake, particularly heavy consumption, is a significant risk factor for tuberculosis. This study sought to establish the association between alcohol abuse and tuberculosis prevalence in Othaya Level 4 hospital, Kenya. The study was anchored on the ecological systems theory and employed descriptive survey design. The target population of this study were patient attending TB Clinic in Othaya Level 4 hospital. The study sample targeted 47 Tuberculosis patients enrolled in Othaya Level 4 hospital clinic, one clinical officer, a nurse, a social worker and a public health officer. Both quantitative and qualitative techniques were used in data collection. Data was collected using structured questionnaires, focus group discussions and key informant interviews. Findings from this study were presented in form of tables and graphs and narration for quantitative and qualitative data respectively. The study found that that 40% of TB patients had low-risk consumption while an equal number had hazardous or harmful alcohol consumption respectively. The results showed that 20% had a score of over 15 meaning that they were alcohol dependent. Age (p=0.0013) and marital status (p=0.013) were statistically significant for alcohol abuse whereby young respondents (<40 years) were 1.484 times likely to have alcohol abuse. Married respondents were 7.2 times likely to have alcohol abuse. Participants identified lack of adequate knowledge on the part of healthcare givers, ignorance and illiteracy on the part of the patients as well as culture as the barriers to overcome alcohol dependence. FGD participants recommended health education and support in overcoming alcohol abuse in treatment of TB.

Keywords: *Alcohol, Alcohol Abuse, Tuberculosis, ecological systems theory*

Introduction

The World Health Organization (WHO) defines alcohol as a psychoactive substance with addictive properties (WHO, 2018). Studies on alcohol indicate that over the past few decades, consumption of alcohol has increased exponentially. The Global Burden of Disease (GBD) (2017) reports that about 1.4 percent of the world's population is affected by alcohol consumption disorders. WHO (2017) estimates the European Region's alcohol consumption is the largest in the world. In Russia for instance, the prevalence is 4.7%, meaning approximately 1 in twenty have a dependency on alcohol at any time. According to National Institute for Alcohol Abuse and Alcoholism, about 5.8 per cent of American adults over 18, (about 14.4 million) have alcohol consumption disorder (NIAAA, 2019). WHO (2019) estimates that around 53% of the world's 15-year-olds have ever used alcohol. In East Africa, a systematic review of youth alcohol consumption has shown that 70% of males and 54% of females have ever reported using alcohol (Osaki et al., 2018). Alcohol use disorder (AUD) a medical condition characterized by an impaired ability to stop or control alcohol use despite adverse social, occupational, or health consequences is estimated to affect 3% of Africa's population (Gowing et al., 2015). In Nigeria, Lasebikan et al., (2018) found that 44.4% of the drinking population were more likely to present with AUD. A Tanzanian study by Francis et al., (2018) found that males were more likely (11–

28%) to have AUD than females. In Kenya, study by Takahashi et al., (2017) showed that the sex-standardized prevalence of current alcohol drinkers was 31.7%. The prevalence was higher in men (54.6%) than in women.

Kenya continues to face the greatest challenge to drug misuse amid regulatory attempts to curtail drinking NACADA (2019). According to Kisilu (2020) study, 12.2% of Kenyans aged 15-65 years used alcohol, 8.3% cigarettes, 4.1% used khat and 1.0% used bhang /cannabis. Alcohol consumption saw a total volume growth and current value growth due to the better socio-economic conditions, the urbanization and a growing number of rich young adults (Kisulu, 2020). Macintyre & Bloss (2011), portrays popular and widespread tiny pubs and beer huts in many Kenyan villages and cities. Large volumes of alcohol are frequently drunk by persons with impaired immune systems who are at risk of the TB disease in these typically impoverished locations with their closely packed customers.

Studies have demonstrated that individuals who misuse drugs or alcohol are at higher risk of Tuberculosis (Laprawat et al., 2017). Tuberculosis (TB) is an infectious disease commonly associated with the lungs and caused by Mycobacterium tuberculosis (M.tb) (Ali, Karanja & Karama, 2017). TB is spread by droplets from a person with active pulmonary disease emitted into the air through cough, sneezing or speaking, and inhaled by someone else. Despite the fact that most infections have no symptoms called latent TB, latent infections in life can kill around half of those affected (Mathema et al., 2017).

Myers, et al., (2018) indicate that about ten percent of deaths from tuberculosis are due to global substance abuse such as alcohol. The adverse effects alcohol on TB have been reported both in terms of delays in obtaining care as well as non-compliance with medication (Laprawat et al., 2017). According to Laprawat et al., (2017), the fact that drugs and alcohol weaken the body's defense against diseases like tuberculosis. Mafukidze, Calnan, & Furin (2016) indicate that people with alcohol use problems typically spend some time where TB can spread more quickly, such as cramped or poorly ventilated homes or social environments where people who have TB contagious but do not know this are often spending in other areas. Studies have further demonstrated that alcohol abuse also affects treatment maintenance and alignment with routine TB therapy. Low adherence to drugs and rising TB defaults have been reported routinely in many countries in patients who drink alcohol (Myers et al., 2018; Silva, et al., 2017). Alcoholics are more likely to develop drug resistance and such patients need longer treatment regimens

Kenya is among the twenty-two (22) TB high burden countries in the world which contribute 80% of the global TB burden (Kanco.org). The National TB prevalence survey (2016) found that in 2015, 82,000 patients were screened and treated for TB. Enos et al., (2018) also revealed that two thirds of prevalent cases of TB disease in Kenya (15–44 years) are related to the youthful age classes (14–34 years of age). Nyeri County recorded an incidence of 1478 cases in 2016. Pulmonary TB cases were 1,262 accounting for 85.4% of all reported cases (Wangari, Chege, & Njogu, 2017). Othaya Level 4 hospital recorded the highest number of new TB incidences in 2018 and 2019 compared to other level 4 hospitals. The reasons for the upsurge of TB are not well known.

Alcoholism and addiction impact people differently depending on gender, age, education, environment, lifestyle, mental health, financial level, and even where they live. Alcohol use has different health consequences for different groups, particularly those determined by demographic variables such as age, race/ethnicity, and gender.

According to Delker, Brown & Hasin (2016) youth between ages 18–25 are at high risk of accidental injury due to drinking compared to overall public. Kendagor et al., (2018) found out that Heavy Episodic Drinking (HED) was 35.5% for 18–29 years' age category. The study concluded that that there is a

connection between alcohol misuse and age. In other studies, men especially in older cohorts, reported greater alcohol intake and binge drinking (Delker et al., 2016; Han et al., 2017; Kendagor et al., 2018)

Education level of an individual would be a good indicator of his economic status. This is because if an individual has vocational skills, he/she would be more likely to be engaged compared to those with no skills. A study by Vignesh, Singh, Mohan, Murthy & Joshi (2015) inspected relationship between socioeconomics and seriousness of alcohol reliance among people getting treatment. Aftereffects of the review showed huge relationship between Short Alcohol Dependence Data survey (SADD) Score and training.

Reddy et al., (2014) study concentrated on the segment factors related to alcohol reliance condition. The study established that alcohol reliance disorder was more among jobless, untalented and semi-gifted patients. Vignesh et al., (2015) showed critical relationship between Alcohol Dependence Scale (ADS) Score and yearly pay. Cook at al., (2011) researched on the connection between socio-segment components and alcohol drinking. The study did an Alcohol Use Disorders Identification Test (AUDIT) score in a populace test of working-age men in Russia. The AUDIT found out that alcohol utilization and alcohol related issues were higher in men who were jobless looking for work contrasted to those in customary paid business. These studies thus demonstrate that there is a connection between financial status and alcohol abuse with those of low financial status being generally helpless.

In Imtiaz at al., (2017); Volkmann et al., (2015); Obwoge, Sang & Wakube (2016) and Kasera, (2017) review, drug consumption, alcohol intake and alcohol-related disorders were analysed by meta-analysing of the retrospective and case-control trials as tuberculosis risk factors. These three groups have been associated with a higher risk of TB. Dosage-response meta-analyzes indicate greater attributable tuberculosis risk at the highest alcohol intake rate. The drug-attributable disease prevalence was also measured on the basis of meta-analysis of drug dose. The tuberculosis burden of the disease was greatly affected by alcohol consumption, with the most serious effects estimated for the African region.

Laprawat et al. (2016) study found a noteworthy decrease in the pervasiveness of alcohol use issue among TB patients over a 6-month time span, as likewise found in the benchmark group of a brief alcohol mediation preliminary among TB patients in South Africa. Oyugi et al. (2017) considered patient components which impact adherence to against TB treatment among TB patients at Njoro Sub County Hospital. Default were higher among alcohol users rather than non-alcoholics. The outcomes indicated that the entirety of the TB patients taking alcohol on consistent schedule (100%) missed their TB drugs.

Yonge et al., (2016) study considered the hazard factors in pneumonic tuberculosis among patients going to different facilities in Mombasa. From the information, smoking and alcohol utilization were related with TB contamination with 37.1% of the patients being smokers and 42.9% being alcohol buyers. In an investigation to decide the hazard factors that are related with the improvement of tuberculosis among the HIV negative people in Bomachoge Sub County, Kenya, Onkware (2016) found that alcohol drinking was related with contamination with TB. The chances of being a TB case among people who were at present drinking was 4.7 occasions higher than the individuals who had never taken alcohol while past drinking didn't show any affiliation.

In an appraisal of variables related with interference of treatment among patients on DOTS in Nandi County, Kenya, Wanyonyi et al., (2017) found that treatment interference was related with every day alcohol utilization of > 3 days out of each week contrasted with utilization of ≤ 3 days out of every week. Another study in Nairobi found that smoking and alcohol use were related with TB disease

with 36% of the patients being smokers and 39.5% being alcohol buyers (Ndungu et al., 2013).

This background indicates that a number of studies have been conducted in different parts of the world providing evidence of a relationship between alcohol abuse and prevalence of Tuberculosis. Nonetheless, as indicated earlier the pathways through which problem of alcohol use have an impact on prevalence of TB is not clear. Therefore, in light of the high prevalence of TB in Kenya and alcohol abuse, the current study sought to find out the link between alcohol abuse and prevalence of tuberculosis patients in Othaya Level 4 Hospital.

Methodology

This study adopted a descriptive research design. Descriptive research design was employed due to its effectiveness in analyzing non-quantifiable issues, creating the possibility of observing a phenomenon in a completely natural and unchanged natural environment and can be used to integrate qualitative and quantitative data collection methods

The study was conducted in Othaya Level 4 Hospital which is situated in Othaya town, Nyeri South Sub County in Nyeri County. The county has four (4) TB clinics in four Sub-Counties. These include Mt. Kenya level 4, Othaya level 4, Mukurwe-ini level 4 and Karatina level 4 hospitals. Othaya level 4 Hospital was selected using purposive sampling because it had the highest recorded number of new TB infections among all level 4 hospitals in Nyeri County (DHS, 2020). The hospital offers a wide range of curative and preventive medical services. The facility has a TB clinic which specializes in diagnosing and treating TB patients.

The population of this study constituted 47 patients enrolled in TB clinic including. Key informants targeted for the study included one clinical officer, a nurse, a social worker and a public health officer (Othaya Hospital, 2020). The health workers in the study were selected because they manage the TB patients on a day to day basis and therefore are resourceful persons to acquire information on mitigation strategies and barriers hampering effective response to TB. Table 1 shows the target population of the study

Table 1: Target Population

Population	Number
Active TB patients	47
Clinician	1
Nurse	1
Social Worker	1
Public Health Officer	1
Total	51

Source: Othaya Hospital, 2020

Sampling Procedure

Census method of sampling was employed in this study. This involves a complete enumeration of all subjects in the population (Bryman, 2016). Therefore, all 47 TB patients attending Othaya level 4 Hospital were targeted for the study. In addition, all 4 health workers in the chest clinic were included in the study as shown in Table 2.

Table 2: Sampling Frame

Population	Number
Active TB patients	47
Clinician	1
Nurse	1
Social Worker	1
Public Health Officer	1
Total	51

Source: Field Data, 2021

Data Collection

Data in this study was collected using self-administered questionnaires, Focus Group Discussion guide, and Key Informant guide. The questionnaire had 2 parts: A and B. Part A collected data on the socio-demographic characteristics of respondents which included gender, age, marital status, occupation and

income status. Part B collected data on factors contributing to co-occurrence between alcohol use and tuberculosis among patients in Othaya Level 4 Hospital. This section also had items focusing on identifying barriers to alcohol abuse treatment and TB as well as knowledge of treatment approaches available for both TB and alcohol abuse

A focus group discussion consisting of 10 TB patients (6 males and 4 females) attending Othaya level 4 Hospital was conducted. The focus group discussion participants were selected randomly from the 47 respondents. A key informant interview was used to collect data from the health workers in the chest clinic who include a clinical officer, a nurse, a social worker and a public health officer. Data from both FGD and Key Informant Interview was recorded using mobile phone for analysis of key themes emanating from discussions. The researcher sought informed consent from the respondents. In addition, respondents were assured of anonymity and confidentiality and also were assured that the results were for academic purposes. A pilot study was conducted in Mukurwe-ini level 4 hospital. Mukurwe-ini level 4 hospital was preferred because it is similar to Othaya level 4 hospital in terms of services provided and characteristics of the catchment population. 5 TB patients and 2 health workers in the chest clinic were used in the pilot.

Data Analysis

Data collected from questionnaires was coded using Statistical Package for Social Sciences (SPSS) version 24. It was analyzed using quantitative techniques and reported using descriptive methods such as table and pie charts. Qualitative data from open ended questions, interview and focus group discussion was analyzed through emanating major themes and presented through narratives

Results

Response Rate

Out of 47 TB patients that were targeted for the study, 45 participated. This is in addition to the 4 health workers in the chest clinic which represented a 96.1% response rate as shown in Table 3 This response rate is considered adequate for generalization of the results of the study as it is higher than the 70% recommended for descriptive studies by Mugenda & Mugenda (2013).

Table 3: Response Rate

Population	Number	Partici-pants	Response Rate
Active TB patients	47	45	95.7
Clinician	1	1	100.0
Nurse	1	1	100.0
Social Worker	1	1	100.0
Public Health Of-ficer	1	1	100.0
Total	51	49	96.1

Source: Field Data, 2021

Socio-Demographic Characteristics of TB Patients

Socio-demographic characteristics assessed in the study included gender, age, marital status and occupation of respondents. Results in Table 1.4 show that majority (82.2%, n=37) of the respondents were male. Results further shows that 37.8% (n=17) were aged over 50 years while 31.1% (n=14) were aged between 34 and 41 years. The mean age was 43 years. The youngest respondent was aged 23 years while the oldest was aged 59 years. Slightly above half (55.6%, n=25) were married, 17.8% (n=8) were single while an equal number 17.8% (n=8) were divorced or separated. Majority (66.7%, n=30) of the respondents were self-employed while 33.3% (n=15) were unemployed. So, majority of the respondents in the study were middle-aged married self-employed men.

Table 4: Socio-Demographic Characteristics of TB Patients

Demographic Characteristic	Categories	Frequency (n=45)	Percent (%)
Gender	Male	37	82.2
	Female	8	17.8
Age (years)	18-25	1	2.2
	26-33	5	11.1
	34-41	14	31.1
	42-49	8	17.8
	>50	17	37.8
Marital status	Single	8	17.8
	Married	25	55.6
	Divorced/Separated	8	17.8
	Widowed	4	8.9
Occupation	Self-employed	30	66.7
	Unemployed	15	33.3

Source: Field Data, 2021

Tuberculosis Infection in Respondents

The researcher sought to establish the morbidity of tuberculosis patients in the study. The findings are presented in Table 1.5. Majority (82.2%, n=37) of the respondents had pulmonary TB. Slightly less than half (44.4%, n=20) indicated that they suffered from TB for between 1 and 3 months while (31.1%, n=14) had had TB for less than 1 month. Majority (84.4%, n=38) indicated that they had never had TB before. Similarly, majority (75.6%, n=34) indicated that they did not have a family member who had suffered from TB. Majority (84.4%, n=38) of the respondents indicated that they had disclosed their TB status to their family. So, majority of respondents in this study were new TB patients in that they had not suffered from the condition before.

Table 5: Tuberculosis Infection among Respondents

	Categories	Frequency	Percent
Type of TB	Pulmonary TB	37	82.2
	Extra Pulmonary TB	8	17.8
Length of time with TB	<1 month	14	31.1
	1-3 months	20	44.4
	4 - 6 months	8	17.8
	7-9 months	3	6.7
Whether respondent had TB before	Yes	7	15.6
	No	38	84.4
Member of family ever had TB	Yes	11	24.4
	No	34	75.6
Whether respondent has disclosed TB to family	Yes	38	84.4
	No	7	15.6

Source: Field Data, 2021

Alcohol Abuse among TB Patients

Respondents in the study were asked to indicate if they consumed alcohol. Majority (77.8%) of the respondents in the study indicated that they did not consume alcohol while 22.2% of the respondents said they consumed alcohol. The findings are as shown in Figure 1

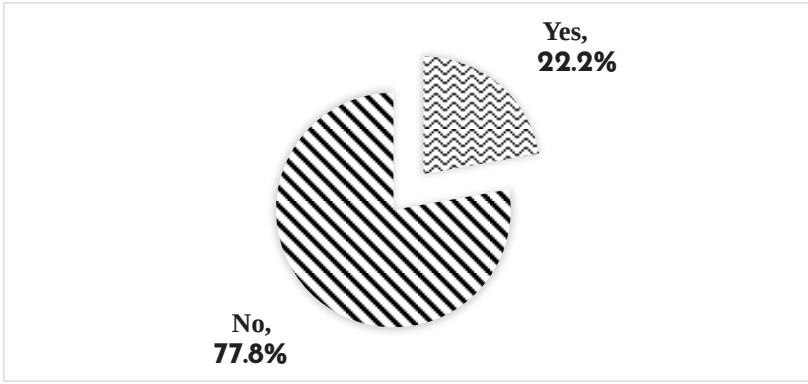

Figure 1: Alcohol use among TB Patients

Source: Field Data, 2021

Type of Alcohol Consumed among TB Patients

Among those who consumed alcohol, the researcher sought to find out the type of alcohol they consumed. Results in Table 6 show that half (50%, n=5) of those who consumed alcohol took beer, 30% (n=3) consumed spirits while 10% (n=1) consumed traditional brew. The data is presented in Table 6

Table 6: Type of Alcohol Consumed

Type of alcohol	Frequency	Percent
Beer	5	50
Spirits	3	30
Traditional brew	1	10
Total	10	100

Source: Field Data, 2021

Frequency of Alcohol Consumption of Drink containing alcohol

Respondents in the study were asked to indicate how often they had a drink containing alcohol. Results in Table 6 show that 40% (n=4) indicated that they took alcohol 2 to 4 times in a month while an equal number took alcohol 2 to 3 times in a week. The study probed further to establish out how many drinks were taken in a typical day. Majority (60%, n=6) indicated between 1 and 2 drinks while 30% (n=3) indicated 3 or 4 drinks.

Table 6: Frequency of Alcohol Consumption of drink containing alcohol

	Categories	Frequency (n=10)	Percent
Frequency of alcohol intake	Monthly or less	1	10
	2 to 4 times a month	4	40
	2 to 3 times a week	4	40
	4 or more times a week	1	10
Number of alcoholic drinks consumed in a day	1 or 2	6	60
	3 Or 4	3	30
	5 or 6	1	10

Source: Field Data, 2021

Injury because of Drinking

The researcher sought to find out from the respondents if they or someone else had been injured as a result of their drinking. As shown in Figure 2, majority (80%, n=8) indicated that neither they nor someone else had been injured as a result of their drinking.

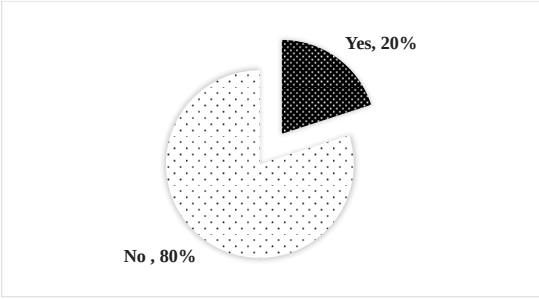

Figure 2 Injury because of Drinking

Source: Field Data, 2021

Intervention for Drinking

Respondents in the study were asked to indicate whether a relative, friend, doctor, or another health professional expressed concern about their drinking or suggested they cut down. Majority (80%, n=8) replied on the affirmative with half (40%, n=4) indicating that this happened in the previous one year while the other half (40%, n=4) indicating that it happened but not in the previous year. The findings are presented in Table 7

Table 7: Intervention for Drinking

Response	Frequency	Percent
No	2	20
Yes but not in last year	4	40
Yes during last year	4	40
Total	10	100

Source: Field Data, 2021

Summary of Alcohol Abuse

The responses in this section were summed up to assess level of alcohol abuse. The mean score was 9.3. Results in Table 8 show that (40%, n=4) scored between 1 and 7 while an equal number (40%, n=4) scored between 8 and 14. This means that 40% had low-risk consumption while an equal number had hazardous or harmful alcohol consumption respectively. The results show that 20% (n=2) had a score of over 15 meaning that they had alcohol dependence.

Table 8: Summary of Alcohol Abuse

Score ranges	Frequency	Percent
1-7 (low-risk consumption)	4	40
8-14 (hazardous)	4	40
Over 15 (alcohol dependence)	2	20
Total	10	100

Source: Field Data, 2021

Association of Socio-Demographic Characteristics and Alcohol Abuse

Chi-square tests were conducted between the socio-demographic characteristics of respondents and alcohol abuse. Results in Table 9 shows that age (p=0.0013) and marital status (p=0.013) were statistically significant. Cross tabulation showed that young respondents (<40 years) were 1.484 times more likely to have alcohol abuse. Similarly, married respondents were 7.2 times more likely to have alcohol abuse.

Table 9: Association of Demographic Characteristics and Alcohol Abuse

	Chi-square (x^2)	Degrees of freedom (df)	Significance (p)	Odds ratio (OR)
Gender	0.043	1	0.835	1.045
Age	6.178	1	0.013***	1.484
Marital status	6.178	1	0.013***	7.200
Occupation	0.474	1	0.491	1.129

****Significant at 95% Confidence Interval*

Source: Field Data, 2021

Qualitative Analysis

A Focus Group Discussion of 10 TB patients (6 males and 4 females) was conducted. The results are presented in this section. Participants were asked what they knew about alcohol. They observed that alcohol was bad as it had a lot of negative health effects. However, a few said it was acceptable as it gives one a high. Participants were asked what they knew about tuberculosis. All of them knew of tuberculosis and all recognized it as a potentially fatal disease. The respondents indicated that it has a cure and also indicated that there is stigma associated with it. One of the participants said:

Tuberculosis is dangerous and kills fast if medical attention is not sought quickly Tuberculosis can be cured if one goes to the hospital and takes the medication as advised. People fear revealing that they have tuberculosis because they think that it is because of HIV/AIDS (Focus group discussion)

The participants in focus group discussion were then asked to indicated how in their opinion, they think they got tuberculosis. Majority indicated that they did not know how they got but a few indicated that they suspect overcrowded areas such as markets, pubs and jail. Participants were further asked to indicate how alcohol abuse influences TB infection. Respondents indicated that use of alcohol negatively affects TB treatment. A participant in FGD argued that:

> *One cannot get cured from TB while using alcohol. This is because alcohol interferes with how medication is absorbed One is unable to eat well and this affects TB treatment. This is because one needs to eat well when taking Tuberculosis medication. Poor nutrition puts the body at risk of many diseases including TB due to poor immunity (Focus Group Discussion)*

Another participant said that:

> *Environment where alcohol is served has poor exchange of air. This makes it easy for one to contract or spread TB. Use of alcohol affects adherence of medication. One forgets to take drugs as instructed. This affects the treatment because cure requires consistent taking of medication as advised One fails to honor clinic appointments. This affects treatment because the doctors are not able to make required follow up (Focus Group Discussion)*

The researcher sought to find out from the participants on what information they were given about alcohol when taking TB medication. Participants indicated that they were warned against taking alcohol while on medication due to its effect on medication and food.

From the key informants' interviews, respondents indicate how alcohol abuse influenced tuberculosis in the facility. Commenting on role of alcohol in drug non-adherence default of treatment among TB patients, a respondent said:

> *An alcoholic diagnosed with TB tends to default treatment due to forgetting and lack of consistency in TB clinic visit. Alcohol abuse hinders the consumption of anti-TBs in the time and dosage. This is due to poor nutrition and alcohol absorption. Alcohol encourages patients to default treatment due to forgetfulness. This is because alcoholism affects memory (Key informant 1)*

Discussion

The objective of this study was to establish the factor contributing to co-occurrence between alcohol use and tuberculosis among Patients in Othaya Level 4 Hospital. The study established that majority (77.8%, n=35) of the respondents in the study indicated that they did not consume alcohol. This suggests that the prevalence of alcohol consumption in this sample was low. This result compares favorably with the findings of Thomas et al., (2011) in India which reported 29% of alcohol consumption among TB patients with 73% of them having a score of >8 in the AUDIT scale.

The study found that 40% had low-risk consumption while an equal number had hazardous or harmful alcohol consumption respectively. Altogether, the study showed that majority 60% (n=6) of the respondents who consumed alcohol abuse it. This prevalence in the study is markedly higher than that of Yonge et al., (2016) where 42.9% of the respondents had alcohol abuse. The prevalence of alcohol abuse is also higher than that of Suhadev et al., (2011) who found that slightly above half (52%) of the participants had an AUDIT score of >8. The level of alcohol abuse in this study is much higher than that of Laprawat et al., (2016) study in Thailand, who found that 24.4% were positive for hazardous or harmful alcohol use. It is also higher than the prevalence of alcohol abuse in Wanyonyi et al., (2017) at 39.5%.

Marital status was the main risk factor for alcohol abuse whereby married respondents were 7.2 times more likely to have alcohol abuse. This result is similar to that of Boitt et al., (2016) that found a link between the prevalence of alcohol abuse and marriage status. Married couples abused alcohol compared to singles in this study. This may be due to the source of income or stress associated with the multitasking experience and the ability to purchase alcohol as a result of stable stress. This finding is also supported by Gezahegn & Mitiku (2014), who found that married people are more likely to consume alcohol in a cross-sectional study of alcohol consumption and related factors in Ethiopian. However, this result is different from the findings of Kendler et al. (2016) that showed that the psychological and social aspects of marriage, especially the health monitoring of spouse interactions, provide strong protection against the development of alcohol use disorders. Reczek et al., (2016) results show that marriages, including remarriage, reduced alcohol use by men compared to unmarried and that divorce caused alcohol use by men.

Age (p=0.0013) and marital status (p=0.013) were statistically significant for alcohol abuse whereby young respondents (<40 years) were 1.484 times more likely to have alcohol abuse. This result is in tandem with Han et al., (2017) who reported that alcohol abuse is common among older adults. This result is however in contrast to findings of Delker, Brown and Hasin (2016) who found that young adults aged 18–25 were at particularly high risk of developing alcohol use disorder. It is also in contrast to findings of Kendagor et al., (2018) who found that the highest proportion of HED was reported in the 18–29-year age group.

Recommendations

The study recommends that any patient checking in with TB should also be screened for alcohol abuse. This is because the issues of multi-drug TB resistance may be mitigated if issues of alcohol and non-adherence to medication are addressed. Patient checking in for addiction treatment should be screened for TB. The study established that there was a link between marital status and risk of alcohol abuse whereby married respondents were more likely to have alcohol abuse. This may be due to the stress associated psychosocial aspects of marriage. This study recommends that county government should employ counsellors at the hospital to support patients who may have marital challenges. Since the study established a link between alcohol misuse at an early age (18–29), counselling sessions should target this group

The study recommends that the ministry of health ought to conduct a national health education campaign on the risks of alcohol in regards to TB infection. The current campaign is more focused on the curative aspect of TB. Preventive component of sensitizing public on dangers of alcohol use is needed. It is also recommended that free psychological support be availed for alcohol users who have tested positive for TB to enable them fight alcohol abuse and addiction. There is a need to have inter-sectoral collaboration with agencies like NACADA that conduct public education on substance abuse including alcohol and outreach programs. It is also important to employ technology by using tele health and Mhealth interventions targeting reduction in alcohol abuse. The study also recommends that county government of Nyeri ought to enforce existing alcohol control regulations to reduce alcohol abuse. For instance, the requirement that bars should only open at 5 pm is usually not observed and therefore this requirement ought to be enforced to reduce alcohol accessibility. The national government should tighten alcohol advertising and sponsorship which attracts many to indulge. Alcohol billboards should for example be banned and alcohol advertisements on TV and radio ought to be done at late hours and be very infrequent to discourage overproportion of alcoholic substances.

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