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Research Article

Dementia and Its Associated Factors among Alcohol Drinkers in Gondar Town, Northwest Ethiopia, 2023

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ABSTRACT

Background: Alcohol-induced dementia arises from prolonged and heavy alcohol consumption, leading to direct brain damage caused by alcohol neurotoxicity. The World Health Organization (WHO) estimates that globally, 50 million individuals are affected by dementia, with 10 million new diagnoses annually. Among alcohol abusers, the prevalence of alcohol-related dementia ranges from 10% to 24%. Despite a significant surge in alcohol consumption in Ethiopia, alcohol-related dementia remains understudied as an independent medical condition. There is a noticeable dearth of research on the prevalence of alcohol-related dementia and its associated risk factors in Ethiopia. Consequently, this study aims to fill this gap by investigating the prevalence of alcohol-related dementia and identifying contributing factors among adult alcohol consumers in Gondar town, northwest Ethiopia in 2023.

Method and materials: A community-based cross-sectional study was conducted from January 18 to April 28, 2023, in Gondar town, Northwest Ethiopia. In this study, 427 study participants were included by a systematic random sampling technique, with a 96.4% response rate. The interviewer-administered questionnaire, consisting of a dementia standardized measuring tool (MMSE) test and a Computed Tomography (CT) scan, was employed to collect sociodemographic and clinical data. EpiData version 4.6 and SPSS version 25 were used for data entry and statistical analysis, respectively. Descriptive summary statistics like proportion and frequency were used to present the data through tables and graphs. Binary logistic regression was used to determine the associated factors, and a decision for statistical significance was made at a p value of (≤ 0.05).

Result: Out of 427 study participants, 317 (74.2%) were male. The mean age of the study participants was 34.5 (± 0.49 SD) years. The prevalence of dementia among alcohol abusers was 23.2% (95% CI: 19.4-27.4). In multivariable

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logistic regression analysis at 95% CI, age between 36 and 49 years (AOR=4.2; 95% CI: 4.8-7.33) and 50-65 years (AOR=6.4; 95% CI: 4.45-12.86), smoking cigarettes (AOR=3.4; 95% CI: 1.86-11.67), physical exercise (AOR=6.04; 95% CI: 5.6-9.76), Khat chewing (AOR=5.7; 95% CI: 4.32-9.78), diabetic mellitus (AOR=3.6; 95% CI: 1.43-5.94), head injury (AOR=9.8; 95% CI: 5.7-12.96), and depression (AOR=8.7; 95% CI: 4.97-13.76), were significantly associated with dementia.

Conclusion and recommendation: The findings of this study indicated that the prevalence of dementia among alcohol abusers was high. In the current study, age, smoking cigarettes, Khat chewing, diabetes mellitus, head injury, depression, and physical exercise were significantly associated with dementia. Since this cross-sectional study lacks identification of causality, further studies on dementia and its burden with objective tools and a longitudinal study design are required to make better conclusions and recommendations.

Keywords: Dementia, alcohol drinkers, prevalence, associated factors, Ethiopia

Abbreviations: AOR: Adjusted Odd Ratio; COR: Crude Odd Ratio; BMI: Body Mass Index; CT: Computed Tomography; MoCA: Montreal Cognitive Assessment; MMSE: Minim Mini-Mental State Examination; SD: Standard Deviation; SPSS: Statistical Package Software for Social Science

INTRODUCTION

Alcohol-induced dementia is caused by heavy and persistent alcohol use that results in brain damage as a direct result of alcohol's neurotoxicity. High-level alcohol consumption (>14 drink units per week) is certainly linked to an increase in alcohol-induced dementia. It is characterized by a decrease in cognitive abilities, an inability to concentrate, loss of memory, poor judgment, loss of abstract thinking, withdrawal syndrome, frontal lobe syndrome, Wernicke-Korsakoff encephalopathy, and amnesia [1]. Ethanol stimulates inhibitory glutamate (GABA) receptors and suppresses excitatory glutamate receptors, which leads to increased glutamate-induced excitotoxicity and oxidative stress, and permanent neuronal damage associated dementia [2]. Moreover, ethanol also negatively affects the availability of nerve growth factor and brain-derived neurotropic factor, resulting in impaired intracellular signaling pathways. However, low to moderate alcohol consumption is thought to be associated with a lower risk of dementia. The majority of dementia patients reside in countries with low or middle incomes [3]. More than half of all people with dementia are from low and middle-income families. Globally, 47.47 million people were living with dementia in 2019, and that number is expected to rise to 75.63 million by 2030 and 135.46 million by 2050. A systematic review indicated that the prevalence of alcohol-related dementia among alcohol abusers ranges from 10% to 24% [4]. Among the health impacts of dementia are depression, worry, stress, illness, and sleep disturbances, and it has also affected daily work activities, family, and social relationships. The prevalence of alcohol-induced dementia in the United Kingdom is 10%, 8.2% in Australia, 10.5% in India, and, 37% in the United States. The magnitude of alcohol related dementia in sub-Saharan Africa is range from 2-8% [5]. The distribution of alcohol-induced dementia is varied across various African countries, for example, 4.9% in Nigeria, 7.5% in Central Africa, 4 % in Sudan, and 20% in Uganda. There is no data that shows the prevalence of alcohol-induced dementia in Ethiopia. The factors that increase the development of alcohol-induced dementia in alcohol abusers are age, cardiovascular vascular disease, head injury, hypertension, diabetes mellitus, depression, cigarette smoking, hearing loss, and body mass index [6]. Alcohol consumption has increased dramatically in Ethiopia, but alcohol-related dementia hasn't gotten much attention as an independent medical disorder. There aren't enough studies showing the prevalence of alcohol-related dementia and its risk factors in Ethiopia. As a result, the objective of this study was to establish the prevalence of alcohol-related dementia and identify associated factors among adult alcohol drinkers in Gondar town, Gondar, northwest Ethiopia, 2023 [7].

MATERIALS AND METHODS

Study design and setting

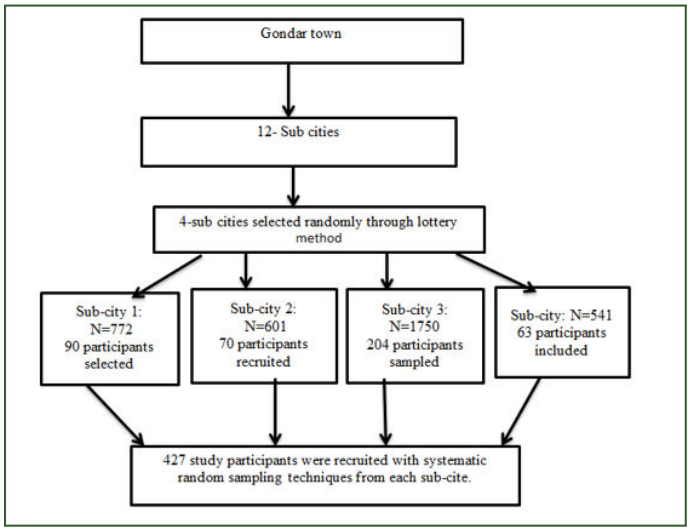
A community-based cross-sectional study was conducted in Gondar town from January 18 to April 28, 2023. The town has 24 'kebeles', 12 of which are classified as sub-cities, 11 as rural 'kebeles', and one as a special 'kebele' (Gondar town administration). 'Kebeles' are the smallest administrative divisions in Ethiopia. It is located 750 kilometers away from Addis Ababa, the capital city of Ethiopia. It was estimated that 224,000 people lived in Gondar town in 2022-2023. The town has one public referral and teaching hospital and seven health centers. The number of private health facilities in the town is 50, including private clinics and one general hospital. In addition, there are 53 medicine retail outlets, including pharmacies and drug stores (Gondar town health bureau).

Population and eligibility criteria

The source of the population was all adult alcohol drinkers in Gondar town, northwest Ethiopia. The study population was all alcohol drinkers who availed themselves during the data collection period in Gondar town. The inclusion criteria were all alcohol drinkers who drank at least three drinks per week, and our exclusion criteria were alcohol drinkers with severe mental disabilities and congenital retardation.

Sample size determination

The sample size was determined by using a single population proportion formula, by taking the Proportion (P) 50%.



Where;

ni is the required sample size;

z α/2=1.96 (critical value for normal distribution at 95% confidence level);

p=0.5 (the proportion);

d=0.05 (the level of precision or acceptable error),

With a 15% contingency rate, the final sample size was 443

Sampling technique and procedure

A systematic random sampling technique was employed to recruit study participants. Four sub-cities were selected through a random lottery method. The total population that lived in the four cities was 180,000. Then we determined the K^{th} interval for each selected referral hospital by dividing the total population size by the total sample size. This means (K=N/nf=18000/443=41). The first sample was selected randomly, and every 41^{st} number was taken into a study (Figure 1).

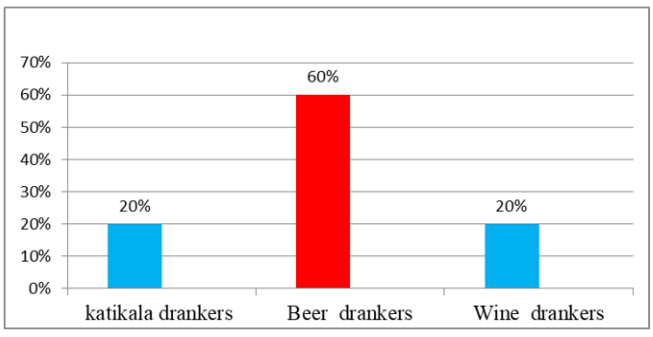


Figure 1: Sampling procedure to recruit study participants in Gondar town, northwest Ethiopia, 2023

Study variables

Dependent variable: Dementia ("Yes" or "No").

Independent variable: Socio-demographic characteristics (age, sex, occupation, educational level, income, family history, residence, marital status), behavioral and related factors (alcohol, smoking, and physical exercise), and clinical factors (hypertension, diabetes mellitus, stroke, trauma, or head injury) were assessed in this study.

Assessment of dementia in alcohol drinkers

Alcohol abusers were diagnosed with dementia using the Mini-Mental State Exam (MMSE) and a Computed Tomography (CT) scan. In addition to this, the clinical signs and symptoms of dementia in study participants were assessed by a neurologist. Mini-mental state examination test, which has a 30-question test that takes around 10 to 12 minutes to complete and helps assess to screen the presence of dementia. Moreover, the CT scan indices were significantly different in alcoholics with dementia and controls. Participants who had alcoholic dementia had larger ventricles, wider cerebral sulci, and wider Sylvian and interhemispheric fissures. Further moreover, neurologist took detailed notes on participants' clinical signs and symptoms of dementia, including difficulty communicating, being forgetful, being usually unaware of time and place, having difficulty making decisions and handling personal finances, having difficulty understanding what is happening around them, being unable to recognize relatives, friends, and familiar objects, and having depression or anxiety that may cause you to react unusually angrily or aggressively. unable to eat without assistance and unable to find his or her way around the home [8]. Finally, we have identified study participants with dementia among alcohol abusers based on cognitive screening tests and neurologist reports obtained from their clinical signs and symptoms.

Diabetes mellitus: Individuals with diabetic multiuse were defined as having 126 mg/dL (7 mmol/L) or higher.

Alcohol consumption

Non-drinkers' referred to those who have never drunk before ('lifetime abstainers') and those who have not drunk in the past 12 months ('former drinkers). Current drinkers' referred to those who have either drunk more than half a cup of alcohol at least once in the past 12 months or those who have drunk any quantity of alcohol at least twice in the past 12 months.

Heavy drinkers: For men, consuming five or more drinks on any day or 15 or more per week and for women, consuming four or more on any day or 8 or more drinks per week.

Hypertension: When an individual was diagnosed as hypertensive or using anti-hypertensive medication [9].

Smoker: Study participant who has smoked at least 100 cigarettes in his or her lifetime but who had quit smoking at the time of the interview.

Body Mass Index (BMI): Participants with BMI of <18.5 kg/m^2, (18.5 kg/m^2-24.9 kg/m^2), (25 kg/m^2-29.9 kg/m^2), ≥ 30 kg/m^2 are underweight, normal weight, overweight and obese, respectively.

Physically active: The WHO recommendation for weekly physical activity is engaging in at least 150 minutes of moderate physical activity or 75 minutes of vigorous physical activity per week.

Hearing impairment: It was defined as an average hearing threshold greater than 25 dB in the worse ear at a pure tone average of 0.5, 1, 2, and 4 kHz [10].

Stroke: It was a clinically defined syndrome of rapidly developing symptoms or signs of focal loss of cerebral function with no apparent cause other than that of vascular origin; symptoms lasted more than 24 hours.

Khat chewing: Participants who answered "Yes" to the question "Have you chewed Khat before?" were classified as chewers; those who answered "No" were classified as non-chewers.

Depression: It was assessed by physicians according to the Centre for Epidemiologic Studies Depression (CES-D) scale, which has 20 questions, participants who scored less than 18 were diagnosed with depression [11].

Blood pressure measurement

A B.Sc. nurse took the patient's blood pressure using a mercurial sphygmomanometer. The measurements of blood pressure were performed in a quiet room in the morning. First, the workers had to rest for at least 10 minutes before entering the room, and then they were guided into the sitting position after about 5 minutes of rest to test the blood pressure of the brachial artery three times. The data were used in the mean of them to express individuals' blood pressure in this study. The lower edge of the cuff should be one inch above the antecubital fossa around the upper arm. Then lightly placed the stethoscope's bell just below the cuff's border over the brachial artery. Then the cuff was quickly inflated to 180 mmHg. After reaching 180 mmHg, air was released slowly from the cuff. According to Korotkoff, the subject's systolic pressure caused the initial banging sound. The diastolic pressure was high when the knocking noise stopped. If the subject's pressure was elevated, take two additional blood pressure measurements. After waiting a few minutes between measurements, the average value was finally recorded in mmHg. Systolic and diastolic blood pressures were reported as the average of three repeat measurements with 30's intervals [12].

Computed tomography measurement procedure

Before entering the CT scan, participants become informed about the CT scanner. Special lights may be used to properly position it, and they may hear slight buzzing, clicking, and whirring sounds as the CT scanner moves during the imaging process. During CT scan measurement, the participants were taken off their clothes and instead given a gown to wear. Metal objects, including jewelry, eyeglasses, dentures, hairpins, hearing aids, and removable dental work, may affect the CT images; therefore, you are asked to remove them prior to the exam. Also, they asked to inform the neurologist of any recent illnesses or medical conditions and if they had a history of heart disease, asthma, diabetes, kidney disease, or thyroid problems. Any of these conditions could increase the risk of an unusual adverse effect. Women also informed their neurologist if there was any possibility of pregnancy. Finally, the neurologist interprets the result of the CT scan to determine whether there are any signs of dementia or not.

Data quality control

The data were obtained through properly prepared English translations of questionnaires after reviewing various literatures and consulting with experts on the subject. Data collectors received training for two days on how to collect data and communicate with study participants to improve data quality. A week before the actual data collection, a pretest was conducted on health participants in Gondar town. This study included continuous monitoring, which was characterized as an important stage in the data collection procedure. Every questionnaire was reviewed for accuracy and completeness after the data had been gathered, and the gathered information was handled and preserved properly until the analysis was completed.

Data management and statistical analysis

Epidata version 3.6 was used for data entry, and it was then exported to SPSS version 25. The data were checked for completeness. Summary statistics like proportion and frequency were used to summarize the result and were displayed in tables and graphs. A binary logistic regression model was used to determine the factors associated with dementia. Those variables with a p-value (≤ 0.2) in the bivariable logistic regression were entered into a multivariable logistic regression model to be adjusted to other variables. Crude and adjusted odds ratios with a 95% CI were reported. The decision for the strength of association was made using the adjusted odds ratio, and the statistical significance was decided at a p value of ($p \leq 0.05$) in the multivariable binary logistic regression. The Shapiro-Wilk test was used to establish the normality of the continuous data's nature. The Hosmer-Lemshow goodness of fit test was used to assess the model's fitness. Cronbach's alpha was employed to test the validity of the dementia questionnaire, and a satisfactory reliability coefficient of 0.76 was discovered.

RESULTS

Background characteristics of study subjects

A systematic random sampling method was employed to recruit study participants. A total of 427 study participants were included, with a response rate of 96.4%. The mean age of study subjects was 34.5 (± 0.49 SD) years. The majority of study participants were male (74.2%), and 64% were married. Nearly two-thirds of study participants followed the Orthodox religion. More than one-third of study participants had monthly incomes above 350 Ethiopian birr. The majority of participants (84.3%) resided in urban areas. Over fifty percent of the participants had a diploma or higher educational level (Table 1).

Table 1: Background characteristics of study subjects in Gondar town, northwest Ethiopia, 2023.

Variables	Category	Frequency	Percent
Sex	Male	317	74.2
	Female	110	25.8
Age (years)	20-29	132	30.9
	30-39	187	43.8
	40-49	71	16.6
	50-65	37	8.7
Religion	Orthodox	268	62.8
	Muslim	127	29.7
	Catholic	7	5.9
	Protestant	25	1.6
Residence	Urban	360	84.3
	Rural	67	15.7
	Single	107	25.1
	Married	275	64.4
Marital statues	Divorced	30	7
	Windowed	15	3.5
	Illiterate	10	2.3
	Primary school	66	15.5
Educational level	Secondary school	127	29.7
	Diploma and degree	224	52.5
Occupation	Construction	86	20.1
	Marchant	121	28.3
	Government employee	220	51.6
	1000-2000	119	27.9
	2001-3500	151	35.4
Monthly income (ETB)	>3500	157	36.7

Behavioral and clinical characteristics of the study particispants

From the total number of study participants, more than 20% were cigarette smokers and Khat chewers. The majority of study participants (75.4%) engaged in regular physical exercise. Most study subjects (89%) had normal blood glucose and blood pressure levels (81.5%). Of the overall participants, 20.4% and 16.4% experienced epilepsy and depression, respectively. The percentage of study participants who had head injuries was 25.1% (Table 2).

Table 2: Behavioral and clinical characteristics of study participants in Gondar town, Northwest Ethiopia, 2023 (n=427).

Variables	Category	Frequency	Percent
Cigarette smoking	Current smoker	90	21.1
	Non smoker	337	78.9
Khat chewing	Chewer	92	21.5
	Non chewer	335	78.5
Making regular physical exercises	Yes	322	75.4
	No	105	24.6
Fasting blood glucose level (mg/dl)	≤ 125 Mg/dl	380	89
	>125 Mg/dl	47	11
Blood pressure (mmHg) systolic	≤ 120 mmHg	348	81.5
	>120 mmHg	79	18.5
Blood pressure (mmHg) diastolic	≤ 80 mmHg	348	81.5
	>80 mmHg	79	18.5
Kidney failure	Yes	23	5.4
	No	404	94.6
Cardiovascular disease	Yes	16	3.7
	No	422	96.3
Head injury	Yes	107	25.1
	No	320	74.9
Epilepsy	Yes	87	20.4
	No	340	79.6
Depression	Yes	71	16.6
	No	357	83.4
Hearing loss	Yes	98	23
	No	329	77

Types of alcohol consumption

This study found that each study participant drinks more than 14 drinks per week. Study participants drank beer, katikala, and wine beverages (Figure 2).

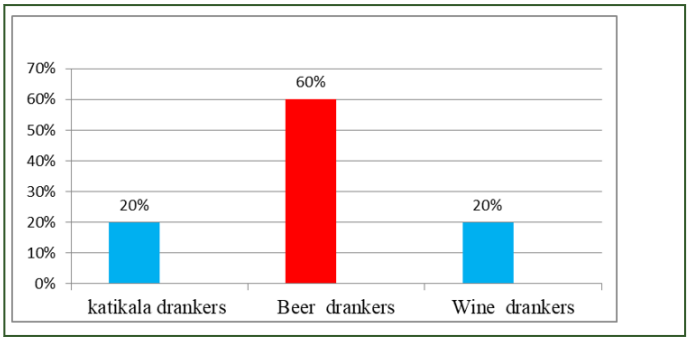


Figure 2: Types of beverages consumed by study participants in Gondar town, northwest Ethiopia, 2023

Prevalence dementia among alcohol abusers

Based on the results of the Mini-Mental State Examination (MMSE) tests and neurologist reports, along with supporting CT evidence, the overall prevalence of dementia among individuals who consume alcohol was determined to be 23.2% (95% CI: 19.4-27.4) (Figure 3).

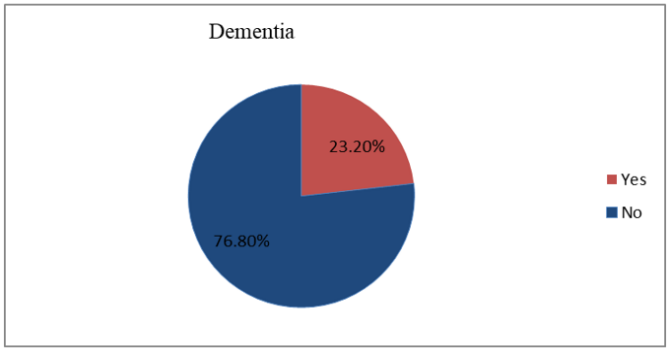


Figure 3: Prevalence of dementia among alcohol abusers in Gondar town, northwest Ethiopia, 2023.

Associated factors of dementia among alcohol abusers

On bivariable logistic regression, factors like age, occupation, cigarette smoking, regular physical exercise, Khat chewing, diabetic mellitus, hypertension, depression, epilepsy, hearing loss, and head injury were candidate variables for multivariable logistic regression analysis a p-value of (≤ 0.2. In multivariable logistic regression within the 95% CI, respondents aged between 50 and 65 years had a 6.4 times higher risk of developing dementia than those between 20 and 35 (AOR=6.4; 95% CI: 4.45-12.86). Cigarette smokers had 3.4 times higher odds of having dementia as compared to non-smokers (AOR=3.4; 95% CI: 1.86-11.67). Participants in the study who did not engage in regular physical activity were more likely to develop dementia than those who did (AOR=6.04; 95% CI: 5.62-9.67). The odd of dementia in Khat chewers was 5.6 times higher than in those who did not chew Khat (AOR=5.7; 95% CI: 4.32-9.78). Participants with diabetes mellitus had 3.6 times higher having the odds of dementia as compared to those participants without diabetic mellitus (AOR=3.6; 95% CI: 1.43-5.94). The odd of having dementia among study participants who had head injuries was 9.8 times higher than those participants who do not have head injury (AOR=9.8; 95% CI: 5.7-12.96). Participants with depression had an 8.7-fold increased chance of developing dementia compared to participants without depression (AOR=8.7; 95% CI: 4.97-13.76)) (Table 3).

Table 3: Factors associated with Dementia among Alcohol abusers in Gondar town, northwest Ethiopia, 2023(n=427).

Variables	Category	Dementia		COR 95% CI	AOR 95% CI	P-Value
		Yes (%)	No (%)			
Age (years)	19-35	7 (7.1)	91 (92.9)	1	1	1
	36-49	18 (10.7)	151 (89.3)	11.19 (4.88-25.63)	4.2 (4.8-7.63)*	0.02
	50-65	74 (46.3)	86 (53.7)	7.20 (4.04-12.88)	6.4 (4.45-12.86)*	0.009
Occupation	Construction	16 (18.3)	71 (81.7)	1	1	
	Merchant	49 (40.5)	72 (59.5)	0.80 (0.41-1.53)	0.4 (0.45-1.7)	
	Government employed	34 (15.5)	186 (84.5)	0.20 (0.16-1.60)	0.18 (0.12-3.4)	
Cigarette smoking	Current smoker	70 (77.8)	20 (22.2)	37.17 (19.87-69.517	3.4 (1.86-11.67)*	0.043
	Non smoker	29 (8.6)	308 (91.4)	1	1	
Making regular physical exercises	Yes	24 (7.5)	298 (92.5)	1	1	
	No	75 (71.4)	30 (28.6)	31.04 (17.147-56.19	6.04 (5.62-9.67)*	0.03
Khat chewing	Chewer	67 (72.8)	25 (27.2)	0.04 (0.02-07)	5.7 (4.32-9.78)*	0.03
	Non chewer	32 (9.6)	303 (90.4)	1	1	

Hypertension	Yes	46 (58.2)	33 (41.8)	0.19 (.076-.22)	0.19 (0.78-1.32)	
	No	53 (15.2)	295 (84.8)	1	1	
Diabetic Mellitus	Yes	39 (81.3)	9 (18.7)	23.03 (10.609-50.03)	3.6 (1.43-5.94)*	0.045
	No	60 (15.8)	319 ((84.2)	1	1	
Epilepsy	Yes	65 (74.7)	22 (23.3)	.01 (.021-.068)	0.12 (0.9-1.94)	
	No	34 (10)	306 (90)	1	1	
Head injury	Yes	83 (61.5)	52 (38.5)	27.51 (14.93-50.76)	9.8 (5.7-12.96)**	0.001
	No	16 (5.5)	276 (94.5)	1	1	
Hearing loss	Yes	68 (69.4)	30 (30.6)	21.78 (12.361-38.40)	1.69 (0.98-3.42)	
	No	31 (9.4)	298 (90.6)	1	1	
Depression	Yes	51 (73.9)	18 (26.1)	18.29 (9.86-33.92)	8.7 (4.97-13.76)*	0.003
	No	48 (13.4)	310 (86.6)	1		

Note: *=significant (p value<0.0.05); **=p significant (p<0.001); Hosmer Lemshow (goodness of fit test) P value=0.65

DISCUSSION

This study determined the prevalence of dementia and its associated factors among alcohol abusers in Gondar town, northwest Ethiopia. This study found a significant prevalence of dementia in alcohol abusers. Age, cigarette smoking, khat chewing, diabetic mellitus, head injury, depression, and regular physical exercises were associated with dementia. The overall prevalence of dementia among alcohol abusers was 23.2% (95% CI: 19.4-27.4). This study was supported by a study conducted in Uganda, 20% [13]. The result of the current study was lower than a study done in Australia, at 35%, and this study on the other side higher than the study conducted in Sudan, 4%, central Africa, 7.6%, and Nigeria, 5%. The possible reasons for the difference might be sociodemographic characteristics like cultural, nutritional, study population, and religion, and methodological issues like study design, study population, methods of analysis, sample size differences, and levels of alcohol consumption [14]. Study participants aged between 36-49 years and 50-65 years had higher odds of dementia than participants aged between 20-35 years (AOR=4.2; 95% CI: 4.8-7.53) and (AOR=6.4; 95% CI: 4.45-12.86), respectively. This study was consistent with a study done in the USA. This may be because ageing is associated with an increase in the proteins synuclein and phosphorylated tau, which are related to cognitive impairments like dementia [15]. In this study, the odd of dementia among cigarette smokers was higher than among non-smokers (AOR=3.4; 95% CI: 1.86-11.67). This study was similar to a study done in the USA, and Brazil. This might be due to the fact that smoking increases the chance of having a stroke and high blood pressure, which in turn enhance the probability of acquiring other risk factors for vascular dementia. Smoking also damages the structure of blood vessels, making it harder for blood to flow freely around the body and into the brain. It also reduces the oxygen level in the blood [16].

In the current study, study participants who did not engage in regular physical exercise were 6.04 times more likely to develop dementia as compared to those who did (AOR=6.04; 95% CI: 5.62-9.67). This finding is supported by a systematic and meta-analytical analysis done by Paula Iso-Markku, et al. This may be because exercise may help the brain release endorphins, chemicals that make people feel happy, and studies have shown that regular exercise makes people feel happy for a long period of time, which can prevent hippocampal atrophy and maintain cognitive function [17]. This study showed that khat chewers had higher odds of developing dementia as compared to non-chewers (AOR=5.7; 95% CI: 4.32-9.78). This study was similar to one performed in Uganda. This can be the result of disruption to the neurons and receptor sites in the prefrontal cortex, which limits the release and uptake of neurotransmitters and results in working memory impairment. This study found that the odds of having dementia in participants with diabetes mellitus were 3.6 times higher than in participants who had no diabetes mellitus (AOR=3.6; 95% CI: 1.43-5.94). This study was consistent with a study conducted in Sweden [18]. This could be because diabetes raises the risk of heart disease and stroke, which hurt the heart and blood vessels. Damaged blood vessels in the brain may contribute to cognitive decline, like dementia. This result found that participants with head injuries had higher odds of dementia as compared to those without head injuries (AOR=9.8; 95% CI: 5.7-12.96). This study was in line with a study conducted in Bethesda, Maryland. This could be a result

of trauma, which can cause post-traumatic dementia by abnormally accumulating tau and amyloid proteins in specific brain regions. Lastly, our study findings revealed that the odds of having dementia among participants with depression were higher than their counterparts (AOR=8.7; 95% CI: 4.97-13.76). This study was similar to a study done in Japan [19]. This may result in hippocampal atrophy, increased amyloid plaque deposition, inflammatory alterations, and impairments in nerve growth factors and glucocorticoids, which may all occur in cases of neuronal deterioration in depression and increase the risk of dementia [20].

CONCLUSION

The findings of this study indicated that the prevalence of dementia among alcohol abusers was high. Reducing heavy alcohol use may be an effective dementia prevention strategy.

Age; smoking cigarettes, khat chewing, diabetes mellitus, head injury, depression, and physical exercise were significantly associated with dementia. Since this cross-sectional study lacks identification of causality, further studies on dementia and its burden with objective tools and a longitudinal study design are required to make better conclusions and recommendations.

LIMITATIONS OF THE STUDY

Since the study design was cross-sectional, it cannot show a cause-and-effect relationship since exposure and outcome were measured at a point in time. There might also be recall bias for questions that require memorization of events in the past.

CONSENT FOR PUBLICATION

Not applicable.

DATA AVAILABILITY

The datasets used and/or analyzed during this study are available from the corresponding author and provided on a reasonable request.

COMPETING INTEREST

The authors declare no commuting interest.

FUNDING

Not applicable.

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AUTHOR CONTRIBUTIONS

Mihret Melese coordinated the process of data collection, data cleaning, statistical analysis, and manuscript writing. Mihret Getnet entered data into SPSS. Dagnew Getnet Adugna, Dereje Esubalehu, Lemlemu Maru, Agnche G/Michael Tsega, Zemenu Wubie Bayeleyegn, Assefa Kebad Mengesha, Gashaw Sisay, Liknaw Workie Limenh, and Mengistie Diress were involved in the interpretation of the results and writing of the manuscript. All authors reviewed and approved the final.

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