Alcohol Use Disorder and Associated Factors Among Elderly in Ethiopia

Asrat Wolde

Department of Psychiatry, School of Medicine, Mizan Tepi University, Mizan Aman, Ethiopia.

ABSTRACT

BACKGROUND: The aim of this study was to investigate the magnitude and associated factors of alcohol use disorder among the elderly living in 3 towns in South West Ethiopia.

METHOD: Cross-sectional community-based study was done among 382 elderly people aged 60 or more from February to March 2022 in South West Ethiopia. The participants were selected by a systematic random sampling method. Alcohol use disorder, quality of sleep, cognitive impairment, and depression were assessed by using AUDIT, Pittsburgh Sleep Quality Index, Standardized Mini Mental State Examination, and geriatric depression scale, respectively. Also, suicidal behavior, elder abuse, and other clinical and environmental factors were assessed. The data was entered into Epi Data Manager Version 4.0.2 before being exported to SPSS Version 25 for analysis. A logistic regression model was used, and variables with a *P*-value less than .05 in the final fitting model were stated as independent predictors of alcohol use disorder (AUD).

RESULT: The magnitude of alcohol use disorder, current alcohol use, and life-time alcohol use among the elderly was 27.5%, 52.4%, and 89.3%, respectively. Also, 7%, 23%, 8.9%, and none of the elderly had nicotine, khat, inhalants, and cannabis use disorder, respectively. Furthermore, AUD was associated with cognitive impairment (AOR, 95% CI; 2.79 (1.47-5.30)), poor sleep quality (AOR, 95% CI; 3.27 (1.23-8.69)), chronic medical illness (AOR, 95% CI; 2.12 (1.20-3.74)), and suicidal ideation (AOR, 95% CI; 5.27 (2.21-12.60)).

CONCLUSION: Problematic alcohol use was higher among the elderly, and cognitive impairment, poor sleep quality, having chronic medical illness, and suicidal ideation were risk factors for AUD. Therefore, community level screening for AUD and comorbid risk factors among this particular age group and managing them is crucial to prevent further complications due to AUD.

KEYWORDS: Elderly, suicide, alcohol use disorder, cognitive impairment, sleep quality, Ethiopia

Background

Alcohol use disorder (AUD) was the most prevalent of all substance use disorders, and about 99.2 million disability-adjusted life years were attributable to alcohol use disorder among the general population.[1] Substance use disorder is a significant issue for the social, economic, and health well-being of communities, individuals, and families. More than 2 billion people drink alcohol; more than 1 billion people smoke tobacco, and about 185 million people use other drugs.[2] The elderly with psychoactive substance use disorder are increasingly consuming alcohol and other substances.[3-6] Elderly people are susceptible to AUD for the following reasons; changes in body composition and metabolism, and underlying medical comorbidities.[3]

AUD is linked to marked limitations in social, psychological, physical, and cognitive functioning. A person with an AUD is 5 times more likely to have a psychiatric disorder.[7] AUD is responsible for depressive disorders and alcohol withdrawal symptoms in the elderly.[8] The elderly with problematic alcohol use are at a greater risk of economic deprivation, social isolation, and the rapid development of dependence.[3,9] Comorbidity between AUD and depression, dementia, and other physical and psychiatric illnesses is common in the elderly.[3,10] Problematic alcohol use is linked with elder victimization,[11-16] being male, poor health, social isolation, cognitive loss, falling injuries, and an elevated risk of infectious disease, using other psychoactive substances,[9,17-19] unstable housing,[20,21] suicidal behaviors,[22,23] and mortality.[24,25]

Problematic alcohol use can affect sleep quality in several ways. Several studies have disclosed that problematic alcohol consumption causes poor quality of sleep characterized by frequent bedtime awakenings.[26] It is known that people with insomnia frequently consume alcohol before going to bed in order to improve their sleeping patterns.[27-29] Moderate alcohol consumption is thought to be a preventive factor for mortality,[27-29] whereas problematic alcohol consumption can increase the risk of mortality from various illnesses.[30,31-34] AUD can also cause several neuropsychiatric disorders; such as peripheral neuropathy, movement disorders, and low learning ability.[35,36] AUD has also been linked to cognitive dysfunction in several studies.[37-43]

Despite all these complications associated with problematic alcohol consumption among people of advanced age, alcohol

and alcohol-related problems are misdiagnosed, underdiagnosed, and undertreated.[44] Despite the many impacts alcohol has on elderly people, such as increased mortality, psychiatric and physical health problems, and increased social and economic burden, little is known about the magnitude of AUD and risk factors associated with problematic alcohol use among elderly people in our country, Ethiopia, or elsewhere. Therefore, the aim of this study was to assess the magnitude of AUD and its associated factors among the elderly aged 60 and above in 3 selected towns in south west Ethiopia.

Methods and Materials

Study design, setting, and period

The current study was carried out in Tepi, Bonga, and Mizan-Aman towns among elderly people aged 60 and above from February to March 2022. Tepi, Bonga, and Mizan-Aman towns were situated 611, 460, and 561 km away from the capital city of Ethiopia, respectively. Tepi and Bonga towns each have 1 general hospital and 1 health center, while Mizan Aman town has 2 health centers and 1 teaching hospital.

Study design and population

A cross-sectional study design was used, and the elderly who were living in towns in Ethiopia and those who met the eligibility criteria were considered the source and study population, respectively. The elderly who lived for 6 months or more were included in the study, while those with communication impairments and those who could not respond as a result of severe psychiatric or physical illness were not included in the study.

Sample size determination and sampling techniques

A single population proportion formula was used to determine the sample size. A prevalence (p) of 50% was used since no similar study was carried out in our country among elderly people aged 60 and above. A 95% confidence interval, a 0.05 margin of error, and a 10% non-response rate was used, and the final sample size was 422. A probability-based systematic random sampling technique was used. Mizan-Aman, Bonga, and Tepi towns were specifically chosen due to their large elderly populations. Thirty percent of each town's kebele were chosen. The sample size was distributed proportionally as per the number of households in each kebele. The total numbers of elderly in Miza Aman town were 1324, those in Bonga town were 1040, and those in Tepi town were 845. The respondents' households were obtained from family health extension workers assigned in each town. After the initial household was selected randomly, every *k*th household was recruited after labeling each individual household. In a case of 2 or more elderly people in a single household, a lottery method was employed to select one of them.

Study variables, data collection tools, and measurement

AUD was the dependent variable in the current study. Religion, age, marital status, educational level, ethnicity, employment status, income status, and clinical factors (sleep quality, cognitive impairment, depression, suicidal behaviors, and chronic medical illness) were all included as independent variables.

AUD was screened using the Alcohol Use Disorder Identification Test (AUDIT). It is a tool used to screen for heavy alcohol use and identify AUD in the elderly.[45,46] The cutoff score indicating alcohol use disorder is 8. The reliability (Cronbach's α) of AUDIT in this study was .91. ASSIST, a standardized tool, was also used to assess lifetime and current alcohol use.[47]

Other substances' (khat, nicotine, cannabis, inhalants, and caffeine) use patterns were assessed using the DSM V criteria for substance use disorder, which included the following parameters: the amount of specific substance use for at least a year; having the desire to cut down or stop; spending a significant amount of time while using or obtaining a substance; the strong desire to use the substance; continuing substance use despite persistent social problems; preferring substance use over family, occupational, and recreational activities; using a substance in situations where it is physically hazardous (while driving, manipulating a machine, etc.); using a substance despite knowing that it has psychological and/or physical health problems; increasing the dose of the substance to achieve the desired effect or reduced efficacy when the usual amount is used; and experiencing psychological or physiological symptoms if the dose is decreased or stopped at all. In order to qualify for a substance use disorder, the elderly must meet 2 out of the 11 criteria for at least a year. An elderly person with mild substance use disorder must fulfill 2 to 3 of the 11 criteria, and an elderly person with moderate substance use disorder must fulfill 4 to 5 of the 11 criteria. In addition, if the elderly met 6 or more out of the 11 criteria, they had a sever substance use disorder.[48]

Cognitive impairment was assessed with the Standardized Mini Mental State Examination (SMMSE) tool; respondents with grade levels of less than or equal to 8 had scores of less than or equal to 22, and respondents with grade levels of grade 9 or more had marks of 24 or more from the score of 30.[49,50] The reliability of this tool in the current study was 0.79.

The Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep quality in the elderly. It is a tool for assessing sleep patterns and quality in the elderly. It measures 7 components of sleep to differentiate "poor quality of sleep from good" by assessing the following dimensions: latency of sleep, subjective quality of sleep, duration of sleep, habitual efficiency of sleep, disturbances of sleep, sleep medications used, and daytime dysfunction that happened due to a poor sleeping pattern in the last 1 month. A Likert scale of 0 to 3 was used to assess individual variables, with a score of 0 shows a positive response and a score of 3 shows a negative response. A total PSQI score of greater than 5 means the elderly have poor sleep quality.[51] The reliability of this tool in this study was 0.81.

Previous studies used the Geriatric Depression Scale to screen for depression in the elderly population, and this tool was widely used among the elderly in Ethiopia.[52,53] Geriatric depression scales consist of 15 questions to screen for depression among the elderly. The overall score of 5 or more was indicative of depression in the elderly.[54] The reliability of this tool in this study was 0.86. Social support was measured by using the Oslo-3 social support tool with the following categories; scores of 3 to 8 was indicative of poor social support, scores of 9 to 11 was indicative of moderate social support, and scores of 12 to 14 was indicative of good social support.[55] Suicidal behaviors were assessed with the following question: "have you ever had suicidal ideation or attempt?" The elderly were abused if they responded positively to 1 or more of the 5 elder abuse items listed below. Physical abuse is positive if the respondent had 1 or more positive responses to physical abuse items; such as hitting, kicking, pushing, slapping, burning, and other events that cause bodily harm or pain. Psychological abuse is positive if the respondent was humiliated by someone. If the elderly failed to meet a basic need he or she had care giver neglect. Financial abuse is positive if there is 1 or more positive responses to one of the following events: illegally misusing an elderly person's money, property, or assets. In addition, if the elderly had 1 or more positive responses from the sexual abuse items, such as forced sexual acts, he or she had sexual abuse,[56,57]

Data quality control

An interview administered questionnaire was used to collect the data. An English-language version of the tools was translated into the Amharic version, which is the local official language of the study area. The data was collected by 3 data collectors with a degree in clinical psychiatry and supervised by an expert in the field of psychiatry. The collected data was evaluated for clarity, completeness, and consistency on a daily basis.

Data processing and analysis

The Epi Data Manager Version 4.0.2 was used to code and enter the collected data before it was exported to SPSS for further analysis. Descriptive statistics such as mean and standard deviation were computed for different variables. After bivariate logistic regression, candidate variables with a P-value $<.25$ were transferred to the final multivariable logistic regression model. In the final model, the adjusted odds ratio with a corresponding 95% confidence interval was used to indicate the level of significance for AUD.

Results

Socio-demographic characteristics of the study participants

Of the total of 422 participants eligible to participate, only 382 elderly people participated, whose response rate was 90.5%. The mean age of the respondents age in a year was 67.

The most common characteristics by religion, sex, age group, marital status, occupation, and ethnicity were being a follower of an orthodox church, being female, being in the age group of 60 to 69 years, being married, being a farmer, and being part of the Kefa ethnic group, respectively. Socio-demographic data is given below in Table 1.

The prevalence of alcohol and other substance use disorders

Of the total respondents, 105 (27.5%), 200 (52.4%), and 341 (89.3%) of the elderly had AUD, current alcohol use, and lifetime alcohol use, respectively. Of the total participants, 89 (23%) had khat use disorders; among them, 62 (16.2%), 7 (1.8%), and 20 (5%) had mild, moderate, and severe khat use disorders, respectively. Of the total participants, 27 (7%) had nicotine use disorders. Among them, 4 (1%), 8 (2%), and 15 (4%) had mild, moderate, and severe nicotine use disorders, respectively. Of the total participants, 34 (8.9%) had inhalant use disorders; among them, 22 (5.8%), 0 (0%), or none of them, and 12 (3%) had mild, moderate, and severe inhalant use disorders, respectively. Of the total participants, 300 (78.9%) had caffeine use disorders. Of them, 188 (49.5%), 106 (27.9%), and 6 (1.6%) had mild, moderate, and severe caffeine use disorders, respectively. Furthermore, none of the elderly in this study had a cannabis use disorder (See Table 2).

The clinical and social-related variables

Almost one-fourth of the total participants (27.5%) had a chronic physical illness, and almost none of the respondents had regular physical exercise. Nearly half of the respondents had poor social support, and about 1 in 10 (9.4%) of the elderly were known HIV positive patients. Furthermore, almost half (210, 55%) of the elderly were screened positive for poor quality of sleep. In addition, more than 1 in 3 elderly people (141, 37%) had depression, and 55 (14.4%) of the elderly had suicidal ideation or attempt. Besides, 135 (35.3%) of the elderly people were screened positive for cognitive impairment (Table 3).

Factors associated with alcohol use disorder

According to the bivariate analysis, being 60 to 69 years of age, being male in sex, having khat use disorder, having physical illness, being in a family with poor support, living alone, having poor quality of sleep, having cognitive impairment, being depressed, having suicidal ideation or attempt, and having elder abuse were all associated with alcohol misuse. However, the final fitted model (multivariate logistic regression) showed the following variables; cognitive impairment (AOR = 2.53, 95% CI = 1.18-5.42), poor sleep quality (AOR = 2.67, 95% CI = 1.10-6.44), physical illness (AOR = 3.27, 95% CI = 1.49-7.15), and suicidal ideation or attempt (AOR = 2.07, 95% CI = 1.06-4.40) were all positively associated with AUD among the elderly in this study (See Table 4).

Table 1. The socio-demographic factors of elderly from 3 selected towns in south west, Ethiopia, 2022 (n=382).

VARIABLES	FREQUENCY	PERCENT (%)
Religion		
Protestant	135	35.3
Orthodox	241	63.1
Others	6	1.6
Age of respondents		
60-69	253	66.2
70 and above	129	33.8
Sex		
Male	132	34.5
Female	250	65.5
Income (birr)		
≤1500	125	32.9
>1500	257	67.1
Marital status		
Married	227	59.4
Widowed	75	19.6
Divorced	53	13.9
Single	27	7.1
Occupation		
Retired	42	11
Farmers	223	58.4
≥others	117	30.6
Educational status		
Grade 8 or lower	117	30.6
Grade 9 or higher	265	69.4
Ethnicity		
Kaffa	245	64.1
Bench	90	23.6
Others	47	12.3
Living arrangement		
Living alone	93	24.5
Living with others	289	75.5
Household size		
Less than 3	70	18.3
Three and above	312	81.7
Has health insurance		
Yes	97	25.4
No	285	74.6

Table 2. Prevalence of AUD and substance use disorder of elderly from 3 selected towns in south west, Ethiopia, 2022 (n=382).

VARIABLES	FREQUENCY	PERCENT (%)
Khat use disorder		
Yes	89	23
No	293	77
Alcohol use disorder		
Yes	105	27.5
No	277	72.5
Nicotine use disorder		
Yes	27	7
No	355	93
Inhalant use disorder		
Yes	34	8.9
No	318	83.8
Cannabis use disorder		
Yes	0	0
No	382	100
Caffeine use disorder		
Yes	300	78.9
No	80	21.1
Types of khat use disorder		
Mild	62	16.2
Moderate	7	1.8
Severe	20	5
No	293	77
Types of nicotine use disorder		
Mild	4	1
Moderate	8	2
Severe	15	4
No	355	93
Types of inhalant use disorder		
Mild	22	5.8
Moderate	0	0
Severe	12	3
No	348	91
Types of caffeine use disorder		
Mild	108	49.5
Moderate	106	27.9
Severe	6	1.6
No	80	21.1
Life time alcohol use		
Yes	341	89.3
No	41	10.7
Current alcohol use		
Yes	200	52.4
No	182	47.6

Table 3. Prevalence of clinical and social factors of elderly from 3 selected towns in south west, Ethiopia, 2022 (n = 382).

VARIABLES	FREQUENCY	PERCENT (%)
Physical illness		
Yes	105	27.5
No	277	72.5
Physical exercise		
Regular	7	2
Some time	108	28
No at all	267	70
Social support		
Poor	206	54.2
Moderate	44	11.6
Good	130	34.2
HIV/AIDS		
Yes	36	9.4
No	346	90.6
Sleep quality		
Poor	210	55
Good	172	44
Cognitive impairment		
Yes	135	35.3
No	340	64.7
Depression		
Yes	141	37
No	241	63
Ever ideation or attempt of suicide		
Yes	55	14.4
No	327	85.6
Elderly abuse		
Yes	180	47
No	202	53

Table 4. AUD and associated factors in both bi-variate and multivariate logistic regression analysis of elderly from 3 selected towns in south west, Ethiopia, 2022 (n = 382).

VARIABLES	*P*-VALUES OF COR	*P*-VALUES OF AOR	AOR AT 95% CI
Cognitive impairment			
Yes	.000	.017	2.53 (1.18-5.42)
No	1	1	1
Physical illness			
Yes	.002	.003	3.27 (1.49-7.15)
No	1	1	1
Poor sleep quality			
Yes	.000	.029	2.67 (1.10-6.44)
No	1	1	1
Suicidal ideation or attempt			
Yes	.004	.033	2.07 (1.06-4.040)
No	1	1	1

Abbreviations: AOR, adjusted odds ratio; COR, crude odds ratio.
1 = reference category.

The magnitude of problematic alcohol use in this study was lower than the study done in Brazil, where current alcohol use was 100%, and higher than the studies conducted in South Africa, where current and life-time alcohol use rates were 10.7% and 23.7%, respectively,[58,59] and Nigeria, where current and life-time alcohol use rates were 15.6% and 45.2%, respectively.[19] The rate of alcohol use in this study was 27.5%, which was higher than the studies conducted in Brazil and Nigeria.[58,60,61] The difference can be explained by the variation in culture and screening tool differences among studies. Another possible explanation for why AUD was high in the current study might be the availability of alcoholic drinks. Most alcoholic drinks are culturally fermented and used by the elderly in Ethiopia. For example, an alcoholic drink known as tella replaces water in the culture of Ethiopia, and it is believed that drinking tella is better than drinking pure water. Therefore, tella is available in almost every house and is given to the elderly, women, children, pregnant mothers, and adults instead of drinking pure water. Furthermore, Teji and Arake (almost 40% pure alcohol content) are locally produced alcoholic drinks that any woman can make at home and are used by the elderly and other segments of the population.

This study also discovered that poor quality of sleep was strongly associated with AUD. The current finding was similar to studies done in other parts of the world.[62-64] The possible explanation for the association could be that alcohol consumption has the following effects on the sleep cycle; alcohol use induces deep sleep during the initial phase of the sleep cycle, but, the quality of sleep is compromised when sleep continues

Discussion

The aim of this study was to determine the magnitude of AUD and associated risk factors among elderly people aged 60 or more. Accordingly, the prevalence of AUD, current use of alcohol, and life-time use of alcohol was 27.5%, 52.4%, and 89.3%, respectively. Moreover, cognitive impairment, poor sleep quality, having a self-reported medical condition, and suicidal ideation or attempt were positively associated with AUD among the elderly.

longer as a result of the decreased slow wave sleep cycle and rapid eye movement sleep phase.[26,65] Moreover, alcohol increases sleep-induced apnea by preventing the entry into deep sleep as a result of relaxing muscles in the upper airway and due to increased resistance during air entry into the lung, which can impede breathing severely.[66-68]

According to this study, cognitive impairment was positively linked with AUD. This is consistent with several other studies that found that elderly people with AUD were more likely to experience cognitive decline and impairment than their peers.[39,69-72] The possible explanation could be due to the neurotoxic effects of alcohol, which might result in direct damage to brain structures or indirect effects such as metabolic toxicity, malnutrition, electrolyte disturbances, and physiological disorders such as infection and liver disease.[73,74]

Those with chronic physical illness were more likely to have an AUD than their counterparts in this study. This result is the same as another study,[75] and the possible explanation might be that long-lasting pain and emotional distress due to chronic medical illness might increase the risk of using alcohol as self-medication to temporarily alleviate pain.[76] The other reason could be that alcohol use might reduce the effectiveness of prescribed medications for the underlying medical illness.[77] Problematic alcohol uses might increase the probability of transmission of communicable diseases due to unprotected sexual intercourse among alcohol users due to their intoxication or alcohol blackout.[78] In addition to this, alcohol users might have decreased apatite, poor adherence to medication, a lack of follow-up for treatment, and a direct physiological effect on the body system that increases the possibility of physical illness by increasing the chance of infection. Furthermore, using a combination of multiple substances would affect treatment outcomes; For example; using khat and alcohol has a potential influence on the immunity of substance users, and vulnerable people could develop a series of adverse health effects.[79-81]

The current finding also discloses that suicidal ideation is a predictive factor for alcohol misuse, and this finding is consistent with other comparable studies.[22,82] This association can be explained by the fact that elderly people with problematic alcohol use might have difficulty in making decisions as well as controlling their impulses.[83] Another possible explanation could also be that elderly people experiencing suicidal behavior might use alcohol as self-medication or to hide themselves from reality.[83]

Currently there are numerous evidences that problematic alcohol use is responsible for brain atrophy, dementia, and severe memory impairment.[84] There are also drugs like sodium oxybate, benzodiazepines, and disulfiram to help alcohol withdrawal and alcohol abstinence in alcoholics to decrease alcohol craving, number of drinks per day, and prevent alcohol relapse.[85] Due to alcohol rehabilitation and treatment center is only located in the capital city of Ethiopia, the study region has no access to modern rehabilitation center. Therefore, this finding

highlights the need to establish a community-based mental health service to screen for alcohol misuse and psychiatric disorders due to alcohol misuse in the elderly and to provide early intervention and referral to better facilities. Even though a few referral hospitals have integrated mental health services in Ethiopia, access to mental health services is still insufficient due to a cultural belief that mental illness is caused by supernatural power, and their main choices of treatment are holy water and indigenous medical practices. As a result, nowadays, mental health services are not available in health posts, general hospitals, primary hospitals, or at the community level in Ethiopia. Due to this, the patient and family visit for traditional rituals like drinking holy water and using traditional herbal remedies. Finally, the recommendation to the federal and regional health ministers is to integrate psychiatric services with the primary, general, and tertiary hospitals and other health institutions in Ethiopia, and to use an integrated treatment model for alcohol use disorder and other psychiatric and physical comorbidities rather than treating AUD only.

Limitations of the study

The readers need to understand the following limitations in this study; recall bias, interviewer bias, substance users might deny using it, medical comorbidity was assessed only by a follow-up card, and being a cross-sectional study prohibits drawing causal inference.

Conclusion

This study showed about 1 in 4 elderly people had an AUD. In addition, having poor sleep quality, chronic medical illness, cognitive impairment, and having suicidal ideation or attempt were risk factors for AUD. Therefore, screening and intervention for alcohol misuse and its predictive factors among this particular age group is crucial. It is also imperative to provide proper health education toward alcohol misuse and factors associated with it among the elderly population. Further research is recommended to determine whether the current findings apply to other regions of the elderly in Ethiopia and elsewhere.

Author Contributions
The author made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; has agreed on the journal to which the article has been submitted; and agreed to be accountable for all aspects of the work.

Ethical Approval

For the commencement of data collection, ethical clearance, and a supportive letter were obtained from Mizan Tepi University College of Health Sciences with Ref No: MTU/NR/317/14. Informed consent was obtained from study subjects. Personal identifiers were omitted to maintain the confidentiality of the information. Moreover, the collected data is kept safe throughout the whole data collection and analysis process. This study was conducted in accordance with the Helsinki declaration for research ethics.

Data Availability

Data will be available from the corresponding author upon reasonable request.

REFERENCES

1. GBD 2016 Alcohol and Drug Use Collaborators. The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Psychiatry*. 2018;5:987-1012.

2. Anderson P. Global use of alcohol, drugs and tobacco. *Drug Alcohol Rev*. 2006;25:489-502.

3. Wang YP, Andrade LH. Epidemiology of alcohol and drug use in the elderly. *Curr Opin Psychiatry*. 2013;26:343-348.

4. Foster C, Konnert C, Gorenko JA. Exploring life-course patterns of substance abuse: a qualitative study. *Aging Ment Health*. 2021;25:378-385.

5. Mannocchi G, Di Trana A, Tini A, et al. Development and validation of fast UHPLC-MS/MS screening method for 87 NPS and 32 other drugs of abuse in hair and nails: application to real cases. *Anal Bioanal Chem*. 2020;412:5125-5145.

6. Musile G, Mazzola M, Shestakova K, Savchuk S, Appolonova S, Tagliaro F. A simple and robust method for broad range screening of hair samples for drugs of abuse using a high-throughput UHPLC-Ion trap MS instrument. *J Chromatogr B Analyt Technol Biomed Life Sci*. 2020;1152:122263.

7. Saunders PA, Copeland JR, Dewey ME, et al. Heavy drinking as a risk factor for depression and dementia in elderly men. Findings from the Liverpool longitudinal community study. *Br J Psychiatry*. 1991;159:213-216.

8. Desai TH, Rajput AH, Desai HB. Use and abuse of drugs in the elderly. *Prog Neuropsychopharmacol Biol Psychiatry*. 1990;14:779-784.

9. Sarkar S, Parmar A, Chatterjee B. Substance use disorders in the elderly: a review. *Geriatric Mental Health*. 2015;2:74.

10. Han B, Gfroerer JC, Colliver JD, Penne MA. Substance use disorder among older adults in the United States in 2020. *Addiction*. 2009;104:88-96.

11. Oslin DW. Alcohol use in late life: disability and comorbidity. *J Geriatr Psychiatry Neurol*. 2000;13:134-140.

12. Gilbertson R, Ceballos NA, Prather R, Nixon SJ. Effects of acute alcohol consumption in older and younger adults: perceived impairment versus psychomotor performance. *J Stud Alcohol Drugs*. 2009;70:242-252.

13. Blow FC, Barry KL. Older patients with at-risk and problem drinking patterns: new developments in brief interventions. *J Geriatr Psychiatry Neurol*. 2000;13:115-123.

14. Sklar AL, Gilbertson R, Boissoneault J, Prather R, Nixon SJ. Differential effects of moderate alcohol consumption on performance among older and younger adults. *Alcohol Clin Exp Res*. 2012;36:2150-2156.

15. Kennedy GJ, Efremova I, Frazier A, et al. The emerging problems of alcohol and substance abuse in late life. *J Soc Distress Homel*. 1999;8:227-239.

16. Moore AA, Endo JO, Carter MK. Is there a functional relationship between excessive drinking and functional impairment in older persons? *J Am Geriatr Soc*. 2003;51:44-49.

17. Okonoda KM, Mwoltu GN, Arigbede OO, Yakubu K. Psychoactive substance use in a sample of community outreach participants; prevalence, correlates and ease of incorporating care. *Int J Res Med Sci*. 2017;5:2845.

18. Akinsulore A, Fatoye F, Awaa O, et al. Psychoactive substance use among psychiatric out-patients in a Nigerian Teaching Hospital. *Niger J Psychiatry*. 2012;10:2-7.

19. Lasebikan VO, Gureje O. Lifetime and 7-day alcohol consumption in the elderly, prevalence and correlates: reports from the Ibadan study of aging. *Afr J Med Med Sci*. 2015;44:33-41.

20. Mo A. *Research Methodology with Statistics for Health and Social Sciences*. Nathadex Publications; 2008.

21. Goldberg W. *Users Guide to the General Health Questionnaire. Handbook of Psychiatric Measures*. Nfer-Nelson: Berkshire; 1991.

22. Silva D, Vicente B, Saldivia S, Kohn R. [Suicidal behavior and psychiatric disorders in Chile. A population-based study]. *Rev Med Chil*. 2013;141:1275-1282.

23. Döme P, Kapitány B, Ignits G, Porkoláb L, Rihmer Z. Tobacco consumption and antidepressant use are associated with the rate of completed suicide in Hungary: an ecological study. *J Psychiatr Res*. 2011;45:488-494.

24. Issa BA, Yussuf AD, Olanrewaju GT, Abiodun OA. Mental Health of doctors in a Tertiary Hospital in Nigeria. *Pan Afr Med J*. 2014;19:178.

25. Abdulmalik JO, Adedokun BO, Baiyewu OO. Prevalence and correlates of mental health problems among awaiting trial inmates in a prison facility in Ibadan, Nigeria. *Afr J Med Med Sci*. 2014;43:193-199.

26. Ebrahim IO, Shapiro CM, Williams AJ, Fenwick PB. Alcohol and sleep I: effects on normal sleep. *Alcohol Clin Exp Res*. 2013;37:539-549.

27. Soon-Yeob P, Mi-Kyeong O, Bum-Soon L., Haa-Gyoung Kim, Won-Joon Lee1, Ji-Ho Lee1, et al. The effects of alcohol on quality of sleep. *Korean J Fam Med*. 2015;36:294-299.

28. Chang KJ, Son SJ, Lee Y, et al. Perceived sleep quality is associated with depression in a Korean elderly population. *Arch Gerontol Geriatr*. 2014;59:468-473.

29. Vinson DC, Manning BK, Galliher JM, Dickinson LM, Pace WD, Turner BJ. Alcohol and sleep problems in primary care patients: a report from the AAFP National Research Network. *Ann Fam Med*. 2010;8:484-492.

30. Camargo CA Jr, Hennekens CH, Gaziano JM, Glynn RJ, Manson JE, Stampfer MJ. Prospective study of moderate alcohol consumption and mortality in US male physicians. *Arch Intern Med*. 1997;157:79-85.

31. Russell M, Chu BC, Banerjee A, et al. Drinking patterns and myocardial infarction: a linear dose-response model. *Alcohol Clin Exp Res*. 2009;33:324-331.

32. Wannamethee G, Shaper AG. Alcohol and sudden cardiac death. *Br Heart J*. 1992;68:443-448.

33. Corrao G, Bagnardi V, Zambon A, La Vecchia C. A meta-analysis of alcohol consumption and the risk of 15 diseases. *Prev Med*. 2004;38:613-619.

34. Reynolds K, Lewis B, Nolen JD, Kinney GL, Sathya B, He J. Alcohol consumption and risk of stroke: a meta-analysis. *JAMA*. 2003;289:579-588.

35. Min SK. *Modern Psychiatry*. 5th ed. Ilchokak; 2009.

36. Cloninger CR. Neurogenetic adaptive mechanisms in alcoholism. *Science*. 1987;236:410-416.

37. Hogenkamp PS, Benedict C, Sjögren P, Kilander L, Lind L, Schiöth HB. Late-life alcohol consumption and cognitive function in elderly men. *Age*. 2014;36:243-249.

38. Yeung SLA, Leung GM, Chan WM, Hui YF, Lam TH, Schooling CM. Moderate alcohol use and cognitive function in an elderly Chinese cohort. *J Am Geriatr Soc*. 2011;59:172-174.

39. Järvenpää T, Rinne JO, Koskenvuo M, Räihä I, Kaprio J. Binge drinking in midlife and dementia risk. *Epidemiology*. 2005;16:766-771.

40. Lopes MA, Furtado EF, Ferrioli E, Litvoc J, Bottino CM. Prevalence of alcohol-related problems in an elderly population and their association with cognitive impairment and dementia. *Alcohol Clin Exp Res*. 2010;34:726-733.

41. Kim JW, Lee DY, Lee BC, et al. Alcohol and cognition in the elderly: a review. *Psychiatry Investig*. 2012;9:8-16.

42. Oslin DW, Cary MS. Alcohol-related dementia: validation of diagnostic criteria. *Am J Geriatr Psychiatry*. 2003;11:441-447.

43. Thomas VS, Rockwood KJ. Alcohol abuse, cognitive impairment, and mortality among older people. *J Am Geriatr Soc*. 2001;49:415-420.

44. Adayonfo EO, Adewole AJ, Ehimigbai M. Alcoholism amongst geriatric patients attending general practice clinic of a teaching hospital in Benin City, Nigeria. *Niger Postgrad Med J*. 2019;26:230-234.

45. Selin KH. Test-retest reliability of the alcohol use disorder identification test in a general population sample. *Alcohol Clin Exp Res*. 2003;27:1428-1435.

46. Purcell B, Olmstead MC. The performance and feasibility of three brief alcohol screening tools in a senior population. *Can Psychol*. 2014;55:19.

47. Humeniuk R, Henry-Edwards S, Ali R, Poznyak V, Monteiro M. *ASSIST-Linked Brief Intervention for Hazardous and Harmful Substance Use*. World Health Organization; 2010.

48. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. American Psychiatric Association; 2013.

49. Vertesi A, Lever JA, Molloy DW, et al. Standardized mini-mental state examination. Use and interpretation. *Can Fam Physician*. 2001;47:2018-2023.

50. Gugssa SA, Davey G, Ejigu AA, Metaferia GZ, Medhin G, Kelkile TS. Population norms for the mini-mental state examination in Ethiopia. *Ethiop Med J*. 2011;49:239-247.

51. Buysse DJ, Reynolds CF 3rd, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. *Psychiatry Res*. 1989;28:193-213.

52. Mirkena Y, Reta MM, Haile K, Nassir Z, Sisay MM. Prevalence of depression and associated factors among older adults at ambo town, Oromia region, Ethiopia. *BMC Psychiatry*. 2018;18:338.

53. Girma M, Hailu M, Wakwoya DA, Yohannis Z, Ebrahim J. Geriatric depression in Ethiopia: prevalence and associated factors. *J Psychiatr.* 2016;20:400.

54. Zung WWK. A self-rating depression scale. *Arch Gen Psychiatry.* 1965;12:63-70.

55. Bøen H, Dalgard OS, Bjertness E. The importance of social support in the associations between psychological distress and somatic health problems and socioeconomic factors among older adults living at home: a cross sectional study. *BMC Geriatr.* 2012;12:27.

56. Piri N, Tanjani PT, Khodkarim S, Etemad K. Domestic elder abuse and associated factors in elderly women in Tehran, Iran. *Epidemiol Health.* 2018;40:e2018055.

57. Yadav UN, Paudel G. Prevalence and associated factors of elder mistreatment: a cross sectional study from urban Nepal. *Age Ageing.* 2016;45:609–13.

58. Blay SL, Fillenbaum GG, Andreoli SB, Gastal FL. Correlates of lifetime alcohol misuse among older community residents in Brazil. *Int Psychogeriatr.* 2009;21:384-391.

59. Peltzer K, Phaswana-Mafuya N. Problem drinking and associated factors in older adults in South Africa. *Afr J Psychiatry.* 2013;16:104-109.

60. Nogueira EL, Cataldo Neto A, Cauduro MHF, et al. Prevalence and patterns of alcohol misuse in a community-dwelling elderly sample in Brazil. *J Aging Health.* 2013;25:1340-1357.

61. Okonoda KM, James BO, Piwuna CG, Envuladu EA. Alcohol use disorders and associated factors among an elderly community sample in Nigeria: a cross-sectional survey. *Open J Psychiatry.* 2020;10:114-126.

62. Subedi RK. Prevalence of insomnia and factors associated with it among the elderly people of Sarangdanda VDC in Panchthar District. *Dhaulagiri J Sociol Anthropol.* 1970;4:129-142.

63. Park SY, Oh MK, Lee BS, et al. The effects of alcohol on quality of sleep. *Korean J Fam Med.* 2015;36:294-299.

64. Roehrs T, Roth T. Sleep, sleepiness, and alcohol use. *Alcohol Res Health.* 2001;25:101-109.

65. Gresham SC, Webb WB, Williams RL. Alcohol and caffeine: effect on inferred visual dreaming. *Science.* 1963;140:1226-1227.

66. Aldrich MS, Brower KJ, Hall JM. Sleep-disordered breathing in alcoholics. *Alcohol Clin Exp Res.* 1999;23:134-140.

67. Peppard PE, Austin D, Brown RL. Association of alcohol consumption and sleep disordered breathing in men and women. *J Clin Sleep Med.* 2007;3:265-270.

68. Roth T, Roehrs T, Zorick F, Conway W. Pharmacological effects of sedative-hypnotics, narcotic analgesics, and alcohol during sleep. *Med Clin North Am.* 1985;69:1281-1288.

69. Zhou H, Deng J, Li J, Wang Y, Zhang M, He H. Study of the relationship between cigarette smoking, alcohol drinking and cognitive impairment among elderly people in China. *Age Ageing.* 2003;32:205-210.

70. Siddiquee AT, Kadota A, Fujiyoshi A, et al. Alcohol consumption and cognitive function in elderly Japanese men. *Alcohol.* 2020;85:145-152.

71. Futami S, Ishikawa J, Jubishi C, et al. Prevalence and determinants of cognitive impairment in elderly patients with heart failure– pilot study in a Geriatric Hospital. *Eur J Heart Fail.* 2020;2:265-270.

72. Muhammad T, Govindu M, Srivastava S. Relationship between chewing tobacco, smoking, consuming alcohol and cognitive impairment among older adults in India: a cross-sectional study. *BMC Geriatr.* 2021;21:85.

73. Neiman J. Alcohol as a risk factor for brain damage: neurologic aspects. *Alcohol Clin Exper Res.* 1998;22:346S-351S.

74. Ridderinkhof KR, de Vlugt Y, Bramlage A, et al. Alcohol consumption impairs detection of performance errors in mediofrontal cortex. *Science.* 2002;298:2209-2211.

75. Chesher NJ, Bousman CA, Gale M, et al. Chronic illness histories of adults entering treatment for co-occurring substance abuse and other mental health disorders. *Am J Addict.* 2012;21:1-4.

76. Garland EL, Froeliger B, Zeidan F, Partin K, Howard MO. The downward spiral of chronic pain, prescription opioid misuse, and addiction: cognitive, affective, and neuropsychopharmacologic pathways. *Neurosci Biobehav Rev.* 2013; 37:2597-2607.

77. Schulte MT, Hser Y-I. Substance use and associated health conditions throughout the lifespan. *Public Health Rev.* 2014;35:3.

78. El-Bassel N, Shaw SA, Dasgupta A, Strathdee SA. Drug use as a driver of HIV risks: re-emerging and emerging issues. *Curr Opin HIV AIDS.* 2014;9:150-155.

79. Alvi A, Rizwan M, Sunosi RA, Bin Ali Jerah A. Does khat chewing increases the risk of Mycobacterium tuberculosis infection by macrophage immune modulation? *Med Hypotheses.* 2014;82:667-669.

80. Ranzani OT, Rodrigues LC, Bombarda S, Minto CM, Waldman EA, Carvalho CR. Long-term survival and cause-specific mortality of patients newly diagnosed with tuberculosis in São Paulo state, Brazil, 2010–15: a population-based, longitudinal study. *Lancet Infect Dis.* 2020;20:123-132.

81. Corkery JM, Schifano F, Oyefeso A, Ghodse AH, Tonia T, Naidoo V, et al. Overview of literature and information on "khat-related" mortality: a call for recognition of the issue and further research. *Ann Ist Super Sanita.* 2011;47:445-464.

82. Min KB, Park SG, Hwang SH, Min JY. Precarious employment and the risk of suicidal ideation and suicide attempts. *Prev Med.* 2015;71:72-76.

83. Ramírez Arango YC, Flórez Jaramillo HM, Cardona Arango D, et al. Factores asociados con la ideación suicida del adulto mayor en tres ciudades de Colombia, 2016. *Rev Colomb Psiquiat.* 2020;49:142-153.

84. Topiwala A, Ebmeier KP. Effects of drinking on late-life brain and cognition. *Evid Based Ment Health.* 2018;21:12-15.

85. Busardò FP, Kyriakou C, Napoletano S, Marinelli E, Zaami S. Clinical applications of sodium oxybate (GHB): from narcolepsy to alcohol withdrawal syndrome. *Eur Rev Med Pharmacol Sci.* 2015;19:4654-4663.