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Alcohol Use Disorder in the General Population in Sub-Saharan Africa

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Keywords

Africa · Alcohol use disorder · Epidemiology

Abstract

Introduction: Alcohol use disorder (AUD) is one of the major risk factors for population health worldwide. In some regions, this disorder remains underdiagnosed. This is particularly the case in sub-Saharan Africa, where data on this disease in the general population remains scarce. The aim of this review was to describe the characteristics of AUD in sub-Saharan Africa. **Methods:** We have conducted a systematic review according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. PubMed, Web of Science, African Journals Online, African Index Medicus, PsycINFO, Cochrane, and Scopus were investigated. Studies were included if they were conducted in a general population using a validated assessment tool. **Results:** A total of 16 articles were selected and were conducted in 8 sub-Saharan African countries. The prevalence of AUD ranged from 0.1% to 33.2% in Nigeria. The most commonly used screening tool was the Alcohol Use Disorders Test (AUDIT), and among the factors associated with the

AUD, we find mainly male gender, low income, Catholic religion, and the presence of a psychiatric comorbidity. **Conclusion:** In sub-Saharan Africa, too few studies have investigated the AUD in the general population with validated diagnostic tools. Prevalence data seem to vary widely between and even within countries. The main factors associated with AUD are those found in the Western literature. The wide variety of assessment tools used to screen for AUD makes it difficult to compare prevalences across countries.

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Introduction

Mental and substance use disorders, including alcohol, are among the leading causes of years lived with disability worldwide [1]. Alcohol use disorder (AUD) and its major comorbidity, depression, are among the top 4 most disabling conditions [2]. In 2018, the World Health Organization (WHO) published the Global Status Report on Alcohol and estimated that the harmful use of alcohol was responsible for the death of almost 3 million people, or 5.3% of all deaths [3].

There is wide regional variation around the world in the availability of data on the prevalence of mental disorders, including very low coverage in sub-Saharan Africa [4–6]. In the USA, a national study conducted showed a 12-month prevalence of 13.9% and a lifetime prevalence of 29.1% for AUD [7]. In the African region in 2012, it was shown that alcohol was responsible for 6.4% of all deaths and 4.7% of all disability-adjusted life years [8]. However, too few studies in the general population use reliable assessment tools, most of which are conducted in hospitals. This does not allow a clear estimation of the prevalence of AUD in Africa. A better description of the prevalence of AUD in sub-Saharan Africa at the population level would provide a clearer picture of the distribution of the disorder and its potential determinants on the African continent. In this context, we undertook a systematic review that aimed to describe the characteristics of AUD in sub-Saharan Africa.

Methods

This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [9].

Identification of Studies

Articles were searched through indexed databases: PubMed, Web of Science, African Journals Online, African Index Medicus, PsycINFO, Cochrane, and Scopus. The bibliographic search was conducted until June 2022, and language was unlimited. All references identified were imported into Rayyan[®] software (Qatar Computing Research University) [10] and duplicates were deleted and references were managed using Zotero[®]. In addition, we searched the database of the Institute of Tropical Neuroepidemiology at the University of Limoges (<http://www.unilim.fr/ient/base-bibliographique-de-l-ient/>), thanks to the author's long experience in the epidemiology of chronic diseases on the African continent, as well as in the grey literature database (<http://www.greylit.org/>).

Eligibility Criteria

The studies selected were those that addressed AUD in sub-Saharan Africa, using validated assessment tools [11–18]. There are no restrictions according to language and publication period. The review was restricted to population-based or community-based studies, including those employing methods such as random or probability-based sampling based on a given geographical area. For this study, AUD case was defined as follows: individuals meeting the DSM eligibility criteria; an Alcohol Use Disorders Test (AUDIT) score of 8 or higher, this threshold was chosen for its increased specificity; presence of at least two criteria validated by Cut down, Annoyed, Guilty, Eye opener (CAGE). The WHO STEPwise surveys, despite being conducted in the general population, could not be included because the questionnaire investigates alcohol consumption rather than dependence. Studies

based on selected sample populations, clinic-based or “convenience samples,” editorials, abstracts, case reports, and those not using validated assessment tools were not considered.

Search Approach

The search approach includes the use of Medical Subject Headings (MeSH) and Boolean AND/OR operator to establish logical relations. For research, the equation used was as follows: (“alcoholism” OR “alcoholism” OR (“alcohol” AND “disorder”) OR “alcohol use disorder” OR (“alcohol” AND “related” AND “disorder”) OR “alcohol related disorder” OR “alcohol-related disorders”) AND (“mental disorders” OR “depressive disorder” OR “public health” OR “epidemiology” OR “social stigma” OR “stereotyping” OR “comorbidity” OR “comorbidities”) AND “country” (for each of the sub-Saharan African countries according to the United Nations) OR “Africa south of the Sahara” OR (“Africa” AND “south” AND “Sahara”) OR “Africa south of the Sahara” OR (“sub” AND “Saharan” AND “Africa”) OR “sub Saharan Africa”).

In both grey databases, only the word “alcohol” was used as a keyword in a search. Next, we searched for studies that were conducted in sub-Saharan Africa. All the search equations used in the various databases have been compiled in supplementary file 1 (for all online suppl. material, see <https://doi.org/10.1159/000534675>).

Study Selection

From the different databases used using search equations, the obtained records were saved and stored in Rayyan[®], where duplicates were first automatically excluded. Two reviewers (T.G. and D.E.) excluded the remaining duplicates. These two reviewers then examined the titles and abstracts to exclude irrelevant studies.

Data Collection Process

For each study, the following data were extracted: country, authors, year of publication and study, study design, number, and characteristics of the sample (age ranges, mean or median and sex ratio, the prevalence of AUD, comorbidities, and other factors associated with AUD).

Risk of Bias in Individual Studies

To assess the quality of the articles, the Newcastle-Ottawa Quality Assessment Scale ([NOQAS] adapted for cross-sectional studies) was used. It classifies the studies according to the number of stars recorded (0–10) using the following distribution: selection: 0–5 stars; comparability: 0–2 stars; outcome: 0–3 stars [19]. Studies are then classified into four categories and qualified as follows: total of stars = <4 (poor), 5–6 (average), 7–8 (good), and 9–10 (very good). This classification was carried out by two researchers (T.G. and D.E.) and the differences were solved after discussion.

Results

Study Selection

The study selection process is detailed in Figure 1. The applied research strategy included records for screening: out of the 3,230 initial records, 2,578 were

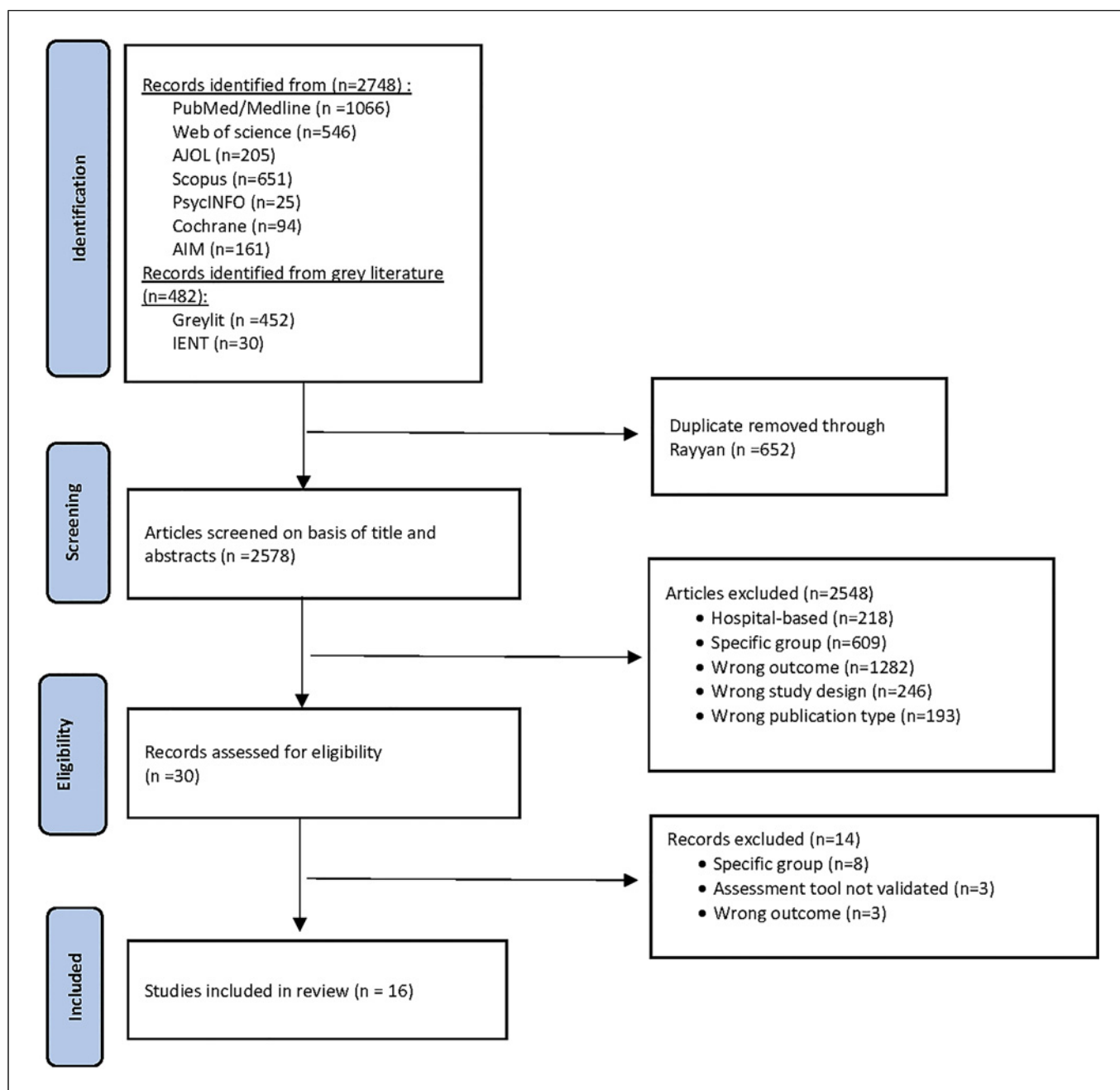


Fig. 1. Flowchart of the selection process.

remaining after the exclusion of 652 duplicates. After screening the titles and abstracts, 2,548 records were excluded. Thirty articles were retained for full-text analysis. Overall, 16 publications were eligible and included. Of the 482 studies identified in the grey literature, none investigated the prevalence of AUD in a sub-Saharan African country.

Study Characteristics

Among the 48 countries of sub-Saharan Africa, the 16 studies selected for this review were conducted in 8 sub-Saharan African countries. Of the 16 studies, 9 (56.3%) were conducted in East Africa [20–28]; 4 (25.0%) of them in West Africa [29–32]; and 3 (18.7%) in South Africa [33–35]. Only Central Africa was not represented.

Table 1. Characteristics of the studies included in the review

Country	Author and year	Period of investigation	Design	Sampling	Area	Sample characteristics		
						years: mean or median or range	N	% male and female
Benin	Tognon-Tchégnonsi et al. [29] (2020)	2013	Cross-sectional	A two-stage cluster probability sampling	Rural	Mean 27.29 (\pm 9.24)	603	62.3–37.7%
Burkina Faso	Ouédraogo et al. [19] (2019)	ND	Cross-sectional	A multistage stratified sampling	Urban and rural	ND	2587	42.8–57.2%
Ethiopia	Zewdu et al. [20] (2019)	2014	Cross-sectional	Random sampling	Rural	Mean 39.3 (\pm 15.3)	1,485	45.7–54.3%
Ethiopia	Kebede and Alem [21] (1999)	1994	Cross-sectional	Cluster sampling	Urban	ND	10,203	45.1–54.9%
Ethiopia	Alem et al. [22] (1999)	ND	Cross-sectional	ND	Rural	From 15 to 60+	10,468	ND
Ethiopia	Abdu and Hajure [23] (2020)	2018	Cross-sectional	A multistage stratified sampling	Urban and rural	Median 31 (\pm 15)	690	60.8%–39.2%
Ethiopia	Legas et al. [24] (2021)	2020	Cross-sectional	Multistage sampling	Urban and rural	From 18 to 55+	848	62.3–37.7%
Kenya	Takahashi et al. [25] (2017)	2015	Cross-sectional	Multistage sampling	Rural	Mean 41 (\pm 14)	478	41.4–58.6%
Kenya	Jenkins et al. [26] (2015)	2012–2013	Cross-sectional	Random sampling	Rural	ND	1,147	ND
Nigeria	Brisibe et al. [31] (2011)	2006	Cross-sectional	ND	Rural	Mean 41.4 (\pm 2.5)	322	51.6%–48.4%
Nigeria	Gureje et al. [32] (2006)	2002	Cross-sectional	Multistage stratified clustered sampling	Urban and rural	From 18 to 75+	4,984	48–52%
Tanzania	Mbatia et al. [28] (2009)	2003	Cross-sectional	Random sampling	Urban	From 15 to 59	899	43.7–56.3%
South Africa	Williams et al. [33] (2008)	2002–2004	Cross-sectional	A three-stage probability sample design	Urban and rural	From 18 to 65+	4,315	ND
South Africa	Peltzer et al. [34] (2011)	2008	Cross-sectional	Multistage random population sampling	Urban and rural	From 15 to 65+	15,828	43.7–56.3%
South Africa	Andersson et al. [35] (2017)	2012	Cross-sectional	A three-staged random sampling	Urban and rural	Mean 27	977	52–48%
South Sudan	Lien et al. [27] (2016)	2012	Cross-sectional	Multistage random cluster sampling	Urban and rural	From 15 to >50	465	46.8–53.2%

All studies were cross-sectional and the sampling method (random, cluster, or multistage) of each study was collected (87.5%) but was not determined in 2 of them (12.5%) [22, 31]. In 2 studies (12.5%), the study period of investigation was not determined [22, 30].

Table 2. Main results of studies

Country	Author and year	Screening-diagnostic instrument	Prevalence of current AUD, %	Factor(s) associated with AUD	NOS score (score/10)
Benin	Tognon-Tchégnonsi et al. [29] (2020)	CIDI DSM-IV	3.9% of alcohol dependence	ND	6/10
Burkina Faso	Ouédraogo et al. [19] (2019)	MINI DSM-IV	1% of alcohol dependence and 0.12% of alcohol abuse	ND	6/10
Ethiopia	Zewdu et al. [20] (2019)	AUDIT	13.9	Increased disability, male gender, depression, treatment gap, high internalized stigma	7/10
Ethiopia	Kebede and Alem [21] (1999)	CAGE	2.7	Greater age, low education level, male gender, employment status	6/10
Ethiopia	Alem et al. [22] (1999)	CAGE	3.7	Christianity, male gender, ethnicity, smoking	6/10
Ethiopia	Abdu and Hajure [23] (2020)	AUDIT	14.1	Common mental disorders, orthodox religion, being single, and living in an urban area	7/10
Ethiopia	Legas et al. [24] (2021)	AUDIT	23.7	Male gender, poor social support, social phobia, perceived high level of stress, current cigarette smoking, and comorbid depression	8/10
Kenya	Takahashi et al. [25] (2017)	AUDIT	31.7	Male gender, friends, and family members who are drinkers	8/10
Kenya	Jenkins et al. [26] (2015)	AUDIT	6.4	Male gender, no education, living in a large household, self-employed	7/10
Nigeria	Brisibe et al. [31] (2011)	AUDIT	33.2	Male gender, polygamous marriage, low education level, practitioners of the traditional religion	6/10
Nigeria	Gureje et al. [32] (2006)	CIDI DSM-IV	0.1% of alcohol dependence and 0.5% of alcohol abuse	ND	7/10
Tanzania	Mbatia et al. [28] (2009)	AUDIT	5.7	Male gender, common mental disorder	8/10
South Africa	Williams et al. [33] (2008)	CIDI DSM-IV	1.2% of alcohol dependence and 4.5% of alcohol abuse	ND	9/10
South Africa	Peltzer et al. [34] (2011)	AUDIT	9	Male gender, low income, low education level, population group Coloureds	9/10
South Africa	Andersson et al. [35] (2017)	MINI DSM-IV	26.5% of alcohol dependence and 9% of alcohol abuse	Marital status, low income	9/10
South Sudan	Lien et al. [27] (2016)	AUDIT	14.2	Male gender, lack of a regular income, and psychological distress	7/10

The studies were realized either in rural ($N = 6$, 37.5%) [20, 22, 25, 26, 29, 31] or urban ($N = 2$, 12.5%) [21, 28] areas or in both areas ($N = 8$, 50.0%) [23, 24, 27, 30,

32–35]. Average ages ranged from 27.29 in Benin [29] to 41.4 in Nigeria [31]. The female gender was more represented in the selected studies than the male gender. It

ranged from 37.7% in Benin [29] to 58.6% in Kenya [25]. Regarding the size of the samples, they range from $N = 322$ in Nigeria [31] people to $N = 15,828$ in South Africa [34] (Table 1).

Assessment Tools

Among the screening tools, the AUDIT was the most used in the selected studies ($N = 9$, 56.3%) [20, 23–27, 30, 32, 34]. Then we find the CAGE that was used in 2 studies (12.5%) [21, 22]. Among the diagnostic tools, the Composite International Diagnostic Interview (CIDI) was employed in 3 studies (18.7%) [29, 32, 33], and the Mini International Neuropsychiatric Interview (MINI) was used in two of them (12.5%) [30, 35]. However, in studies that used the MINI and CIDI for data collection, the diagnostic criteria for AUD were based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria [17]. None of the studies used the DSM-5 [18] for assessing the AUD (Table 2).

Prevalence of AUD and Its Factors Associated

The prevalence of AUD in the studies ranged by country and is presented in Table 2. It ranged in West Africa from 0.1% [32] to 33.2% [31] within Nigeria. In Eastern Africa, AUD prevalence ranged from 2.7% in Ethiopia [21] to 31.7% in Kenya [25]. In Southern Africa, AUD ranged from 1.2% [33] to 26.5% [35] in South Africa.

Eighty percent of studies have shown an association between AUD and social-demographic characteristics. Among them, 9 studies (56.2%) have shown the male gender was associated with AUD, four (25%) had demonstrated an association with a low education level, and 3 (18.7%) had an association with a low income. Four studies (18.7%) did not investigate any potential associations with AUD. Five studies (31.3%) investigated the association between AUD and psychiatric comorbidities (Table 2).

Quality Evaluation

The studies selected in this review were of rather good quality. According to the NOS, the scores ranged from 6 to 9/10 (Table 2). Ten studies (62.5%) [20–23, 26, 27, 29–32] were of good quality and six were of excellent quality [24, 25, 28, 33–35] (Table 2).

Discussion

To our knowledge, this is the first review of AUD in the general population on the African continent. This review provides information on the distribution of AUD in sub-Saharan Africa and its prevalence in the general population. Except for Central Africa, all regions of sub-Saharan Africa

are represented, and we have an idea of the distribution of AUD in urban, rural, or both. Given the results obtained, it would seem that AUD is a major public health problem in sub-Saharan Africa, but the difference in prevalence from one country to another, with 1% in Burkina Faso [30] to Nigeria 33.2% [31], or the difference in prevalence within a single country, from 1.2% [33] to 26.5% in South Africa [35], makes it difficult to establish the extent of the problem on the African continent.

In 2018, the WHO released its Global Status Report on Alcohol and Health [3]. In this report, we find several prevalence estimates of AUD in all regions of the world including sub-Saharan Africa. For each of the countries, WHO obtained the following prevalence estimates: Burkina Faso = 1.8%; Benin = 6.4%; Ethiopia = 2.5%; Kenya = 4%; Nigeria = 0.6%; United Republic of Tanzania = 6.8%; South Africa = 7%; South Sudan = ND.

Eight of the studies included (50%) in our study are close to the estimates made by the WHO, notably in Burkina Faso, where 1% was found [30], in Benin with 3.9% [29], in Ethiopia with 2.7% [21] and 3.7% [22], in Kenya with 6.4% [26], in Nigeria with 0.1% [32], in Tanzania with 5.7% [28], and in South Africa with 9% [34]. Of these 8 studies, 3 used the DSM-IV criteria, 3 the AUDIT, and 2 the CAGE. However, if we had obtained prevalence data with the same tool, it would be easier to compare the data between countries. With the emergence of the DSM-5 criteria in 2013, the criteria of abuse and dependence have been combined into one disorder [36]. In the future, the use of DSM-5 criteria in epidemiological studies of AUD in sub-Saharan Africa will allow to more accurately compare the extent of the disorder in each country. It has been shown that the use of DSM-5 criteria may increase the prevalence of AUD compared to DSM-IV criteria [37], so the data in this review may not reflect the true extent of AUD in Africa. For the 8 studies that reported prevalence far from the WHO estimates, several factors can be taken into consideration such as the proportion of males to females, the proportion of Catholics to Muslims, and that an investigated area may not be representative of the entire territory.

We also showed in this study that socio-demographic factors associated with alcohol use, namely, male gender [20, 21, 24–28, 31, 34], low income [27, 34, 35], education level [21, 31, 34], as well as Catholic religion [22, 23], and comorbid presence of other psychiatric conditions [20, 23, 24, 27, 28], are associated with AUD. In a large epidemiological study of AUD in the USA using DSM-5 criteria, it was also shown that the prevalence of AUD was higher in men, associated with low income, and associated with other psychiatric comorbidities including major depression [7]. Other studies have investigated social-cultural

factors such as stigma and cultural beliefs [20] and showed that these factors could also be associated with AUD. Although important, these factors are still under-researched. However, it has been shown that psychiatric disorders, and in particular substance use disorder, can be associated with significant stigma [38]. Stigma can have an impact on the illness, and access to care and lead to societal rejection [39–41].

Our review used a broad search equation in several databases to identify relevant studies exploring AUD and its potential associated factors in sub-Saharan countries. No date or language restrictions were used in our search strategy. All abstracts and full texts of articles reviewed or read were available in English or French. In addition, we have limited our selection to population-based studies with validated screening tools. This allowed us to identify studies representing a global overview of the AUD in sub-Saharan Africa. In our selection of articles, we made every effort to avoid potential selection bias by including in our analysis only studies that were conducted in the general population and using only screening tools validated for AUD. However, the heterogeneity of the studies found (e.g., various methods for assessment) has not allowed us to clearly describe the prevalence of AUD in sub-Saharan Africa. The accurate assessment of AUD requires tools with robust diagnostic validity to ensure reliable identification and appropriate intervention. Various instruments have been designed to probe excessive alcohol consumption and its potentially harmful effects such as dependence. The CAGE questionnaire and the AUDIT have proven particularly effective in identifying individuals who might have an AUD. However, despite their demonstrated sensitivity and specificity across various populations, these instruments cannot replace a diagnosis made using the DSM-5 criteria.

While the AUD problem appears to be significant in sub-Saharan Africa, not every country faces the problem to the same degree. The WHO points out in its 2018 report that the majority of African countries do not have

written national alcohol policies and that it is necessary to guide states in the development and implementation of effective alcohol control policies [3].

Conclusion

This study provides an overview of the AUD in sub-Saharan countries. It also shows the importance of properly performing the development or cultural adaptation steps, as well as the validation to ensure the quality of the tools. Overall, the problem of AUD seems to be significant in most countries. The use of several different assessment tools for AUD makes a comparison between countries difficult. It will be interesting in the future to study AUD in sub-Saharan Africa as a whole, both in terms of its clinical, epidemiological, and social characteristics. These studies will help clarify the extent of the disorder and allow authorities to take public health measures to reduce the impact of the disease.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

All authors contributed to the conception, design, and preparation of the manuscript. T.G. and D.E. collected data and researched articles. T.G. interpreted and analyzed data. All authors contributed to subsequent revisions of the manuscript. All authors contributed to and have approved the final manuscript.

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