Alcohol consumption and subjective well-being in Ghana: Evidence from the World Health Organisation's study on global ageing and adult health

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Abstract

Background: Adverse outcomes of unhealthy alcohol use are highest in Africa. The prevalence of heavy episodic drinking, defined as 60 or more grams of pure alcohol on at least one occasion at least once per month, remains high among drinkers, particularly in some sub-Saharan African countries.

Objective: This study evaluates sociodemographic factors associated with lifetime alcohol consumption and characterises the relationship between alcohol consumption and subjective well-being across regions of Ghana.

Methods: The dataset of the WHO Study on Global Ageing and Adult Health (SAGE) wave 2 for Ghana was used for analysis. Subjective well-being was measured using the WHO-8 Quality of Life tool. Predictors of the outcome variables were determined using logistic regression in Stata 14.

Results: Overall, 4090 participant entries comprising 1692 males were evaluated. The prevalence of lifetime alcohol use was 20.7%. Lifetime alcohol drinkers were more likely to be male ($p < 0.001$), aged 40-49 years ($p < 0.001$) and having a smoking history ($p < 0.001$) or residence in Southern Ghana ($p < 0.001$). Participants aged 50 years of older (PR 0.67, CI 0.48 - 0.92)who were separated, divorced (PR 0.70, CI 0.48 - 0.99)or widowed (PR 0.51, CI 0.39-0.67) had significantly lower levels of subjective well-being.

Conclusion: Sociodemographic determinants of lifetime alcohol consumption define the at-risk population, and thus, provide a framework for targeted health policies against the harmful physical and psychological effects of unhealthy alcohol intake in Ghana.

INTRODUCTION

Worldwide, some 2.3 billion people consume alcohol [1]. However, Africa has fewer drinkers (32.2%), but drinkers on the continent account for some 20% higher alcohol consumption when compared with other regions [2]. The prevalence of heavy episodic drinking, defined as 60 or more grams of pure alcohol on at least one occasion at least once per month, remains high among drinkers, particularly in

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some sub-Saharan African countries [3]. The nature and distribution of alcohol consumption across countries in Africa are heterogeneous, with a third of all the alcohol consumed not accurately accounted for, and this is primarily due to undocumented local production in communities [2]. In Ghana, alcohol consumers drink on average 22.1 g/day [2].

The physical and psychosocial consequences of unhealthy alcohol use are significant, with the Age-Standardised Alcohol-attributable deaths per 100,000 people (all causes) of 70.6 being the highest in Africa [2]. Likewise, alcohol was responsible for 4.7% of all Disability-Adjusted Life Years (DALYs) in Africa [4]. The relationship between alcohol

consumption and well-being is rather complex. On one hand, it is a recreational activity that evokes joy and satisfaction in many, but alternatively, unhealthy use can lead to a myriad of clinical, psychological and economic adverse outcomes [5]. Alcohol-related complications include liver cirrhosis, cardiovascular disease (hypertension, ischaemic heart disease) and cancers such as breast, liver and gastrointestinal malignancies [6]. Disability associated with alcohol misuse include chronic cognitive impairment with significant limitations in the ability to sustain social relationships [6]. In a region where there is a significant burden of alcohol-related morbidity, data on alcohol-related diseases (e.g. alcohol-related liver disease, dementia, neuropathy, alcoholic cardiomyopathy) are limited, which hinders strategies targeted at reducing alcohol-related harm in Africa [4]. Understanding key determinants of alcohol use and well-being is therefore important in establishing evidence-based alcohol control policies. This nationwide study evaluates sociodemographic factors associated with lifetime alcohol consumption and its relationship with subjective well-being across Ghana.

MATERIALS AND METHODS

The dataset of the multi-national World Health Organisation Study on Global Ageing and Adult Health (SAGE) wave 2 for Ghana was used for this analysismultinational World Health Organisation Study on Global Ageing and Adult Health (SAGE) Wave 2 for Ghana was used for this analysis, as previously described [7]. Two target populations were used in SAGE Wave 2, which included a large sample of persons aged 50 years and older (focus group for SAGE) and a smaller comparative sample of persons in the reproductive age group (aged 18 – 49 years). Overall, SAGE wave 2 collected data from 4735 respondents aged 18 and older. A total sample size of 4,090 adults was used for further analysis, excluding participants with missing or non-applicable data. Specific questions and responses about study variables were extracted from the SAGE 2 survey. The study's independent variables were age, gender, marital status, religion, place of residence, employment status, regional location, self-rated health (SRH), smoking history, body mass index (BMI) and self-reported depression (SRD). The study's dependent variables were lifetime alcohol use and subjective well-being.

Participants were asked the question: "Have you ever consumed a drink that contains alcohol (such as beer, wine, spirits)?" Participants answering 'yes' were classified as lifetime alcohol consumers. Subjective well-being was captured in the SAGE survey using the World Health Organisation's eight Quality of Life (QoL) tool [8]. Participant responses for the outcome variable, subjective well-being, were weighted as "Poor", "Low", "Moderate" or "High" based on the following cumulative scoring from the QoL tool: 0, 1–5, 6–7, and 8, respectively. Data analysis was performed using StataCorp. (20150. Stata Statistical Software: Release 14, College Station, TX: StataCorp LP. This study reduced bias by adjusting for clustering, stratification and the sampling weights used in the SAGE

survey. A weighted Cronbach alpha test of reliability for subjective well-being and QoL was performed. Firstly, weighted descriptive estimates were obtained by evaluating independent associations between covariates and lifetime alcohol consumption using a corrected chi-square test. Secondly, inferential analyses were performed to assess factors correlating with lifetime alcohol consumption and subjective well-being, using logistic regression.

Furthermore, we deployed three statistical models separately: Poisson, ordered logistic and ordered probit regression, thereby adjusting for all covariates significantly influencing lifetime alcohol consumption. The threshold for statistical significance was $p < 0.05$.

RESULTS

The study aimed to identify factors associated with lifetime alcohol consumption and, secondly, to determine the relationship between lifetime alcohol consumption and subjective well-being amongst adults in Ghana. Overall, 4090 participant entries were evaluated, of whom 1692 were male. The prevalence of alcohol use was 20.7% among study participants.

Factors associated with lifetime alcohol consumption among older adults aged 30 or above in Ghana

Lifetime alcohol drinkers were more likely to be male ($p < 0.001$) and without religious affiliation ($p < 0.001$). Additionally, they were more likely to have a smoking history ($p < 0.001$) and to be underweight ($p = 0.004$). Participants who indicated that they were divorced or separated were more likely to be lifetime alcohol users ($p = 0.006$). Furthermore, lifetime alcohol use was most prevalent in the age group 40 – 49 ($p = 0.001$). Comparatively, urban and rural residents had similar prevalence of lifetime alcohol consumption ($p = 0.861$). Working status also did not have an impact on the likelihood of lifetime alcohol use ($p = 0.161$).

Risk factors for lifetime alcohol consumption among older adults aged 30 years and above in Ghana

The relationships between these specific independent variables and lifetime alcohol consumption persisted following logistic regression. Notably, participants who were either male ($p < 0.001$), age 40 – 49 years ($p = 0.033$) or smokers ($p < 0.001$) had a significantly increased likelihood of being lifetime alcohol users. Individuals who were separated or divorced had a significantly increased prevalence of lifetime alcohol use when compared with married individuals ($p = 0.001$). Lack of religious affiliation was significantly associated with a history of lifetime alcohol intake when compared with participants who were Christians ($p = 0.016$). By contrast, Muslims had a significantly reduced prevalence of lifetime alcohol intake ($p < 0.001$). Participants from the Ashanti ($p = 0.007$) & Northern region ($p = 0.031$) were significantly less likely to be associated with lifetime alcohol use compared to participants from the Greater Accra region.

Table 1. Prevalence and demographic characteristics associated with lifetime alcohol use among older adults aged 30 years and above

Demographic variable	Total N=4090	Alcohol use 848 (22.6)	Chi(p-value)
Sex			75.47(0.001)
Male	1692(100)	607(35.8)	
Female	2398(100)	241(11.7)	
Age group			5.86(0.001)
30-39	325(100)	53(16.6)	
40-49	426(100)	107(26.9)	
50-59	1239(100)	257(24.5)	
60-69	1060(100)	219(22.9)	
70-79	704(100)	155(20.4)	
80+	336(100)	57(18.1)	
Marital status			4.59(0.006)
Never married	204(100)	56(29.0)	
Married	2433(100)	561(21.7)	
Separated/Divorced	486(100)	117(31.1)	
Widowed	967(100)	114(13.5)	
Religion			29.43(0.001)
None	120(100)	67(58.1)	
Christian	2974(100)	660(25.9)	
Islam	765(100)	42(5.1)	
Primal Indigenous	231(100)	79(22.1)	
Place of residence			0.03(0.861)
Urban	1637(100)	283(22.9)	
Rural	2453(100)	565(22.4)	
Working status			1.98(0.161)
Working	2855(100)	637(23.7)	
Not working	1146(100)	199(19.8)	
Region			4.06(0.001)
Ashanti	683(100)	107(15.9)	
Brong Ahafo	454(100)	78(27.5)	
Central	521(100)	129(29.3)	
Eastern	307(100)	79(21.0)	
GT. Accra	404(100)	90(26.8)	
Northern	416(100)	50(6.6)	
Upper East	222(100)	48(14.7)	
Upper West	190(100)	30(16.2)	
Volta	369(100)	131(35.6)	
Western	524(100)	106(26.2)	
SRH			0.75(0.471)
Good	2756(100)	594(23.2)	
Moderate	1024(100)	191(20.1)	
Bad	310(100)	63(21.0)	
Ever smoke			61.45(0.001)
Yes	263(100)	153(63.1)	
No	3812(100)	695(20.6)	
BMI			4.53(0.004)
Underweight	469(100)	112(29.4)	
Normal	2214(100)	514(25.4)	
Overweight	870(100)	151(19.6)	
Obesity	537(100)	71(15.7)	
SRD			
Depressed			0.23(0.808)
None	2815(100)	617(22.9)	
Mild	947(100)	166(22.6)	
Moderate	320(100)	65(19.7)	
Extreme	3(100)	0(0.0)	

a Abbreviation; GT = Greater Accra; SRH = Self-Rated Health; BMI = Body Mass Index; SRD = Self-Reported Depression. Analysis adopted row weighted percentages.

Table 2. Logistics regression with 95% Confidence Interval of risk factors associated with lifetime alcohol use among older adults aged 30 years and above in Ghana

Characteristics	Risk factor predictors	Adjusted Odds Ratio	P-value	95% Confidence Interval	
				Lower CI	Upper CI
Lifetime Alcohol consumption	Sex				
	Female	Ref			
	Male	4.42	0.001	2.97	6.57
	Age group				
	30-39	Ref			
	40-49	1.57	0.033	1.04	2.38
	50-59	1.37	0.146	0.90	2.09
	60-69	1.15	0.550	0.72	1.86
	70-79	1.20	0.480	0.73	1.97
	80+	0.88	0.670	0.48	1.61
	Marital status				
	Married	Ref			
	never married	1.73	0.106	0.89	3.35
	separated/divorce	2.10	0.001	1.39	3.19
	widowed	1.03	0.909	0.63	1.69
	Religion				
	Christian	Ref			
	None	2.98	0.016	1.22	7.25
	Islam	0.14	0.001	0.07	0.28
	Primal indigenous	1.01	0.988	0.44	2.28
	Place of residence				
	Urban	Ref			
	Rural	0.93	0.717	0.62	1.40
	Currently working				
	Yes	Ref			
	No	0.93	0.749	0.58	1.48
	Region				
	GT. Accra	Ref			
	Ashanti	0.41	0.007	0.22	0.79
	Brong Ahafo	0.83	0.621	0.40	1.73
	Centra	1.12	0.761	0.54	2.30
	Eastern	0.56	0.120	0.27	1.17
	Northern	0.36	0.031	0.14	0.91
	Upper East	0.53	0.311	0.16	1.81
	Upper West	0.70	0.587	0.19	2.53
	Volta	1.10	0.824	0.48	2.51
	Western	0.87	0.685	0.45	1.68
	SRH				
	Bad	Ref			
	Good	1.04	0.916	0.52	2.06
	Moderate	1.04	0.913	0.51	2.11
	Ever smoked				
	No	Ref			
	Yes	5.22	0.001	2.75	9.90
	BMI				
	Normal	Ref			
	Underweight	1.08	0.752	0.67	1.75
	Overweight	0.84	0.349	0.58	1.22
	Obesity	0.97	0.915	0.61	1.56

b Abbreviation; GT=Greater Accra; SRH=Self-Rated Health; BMI=Body Mass Index; Ref=Reference category used for inferences; CI=Confidence Interval.
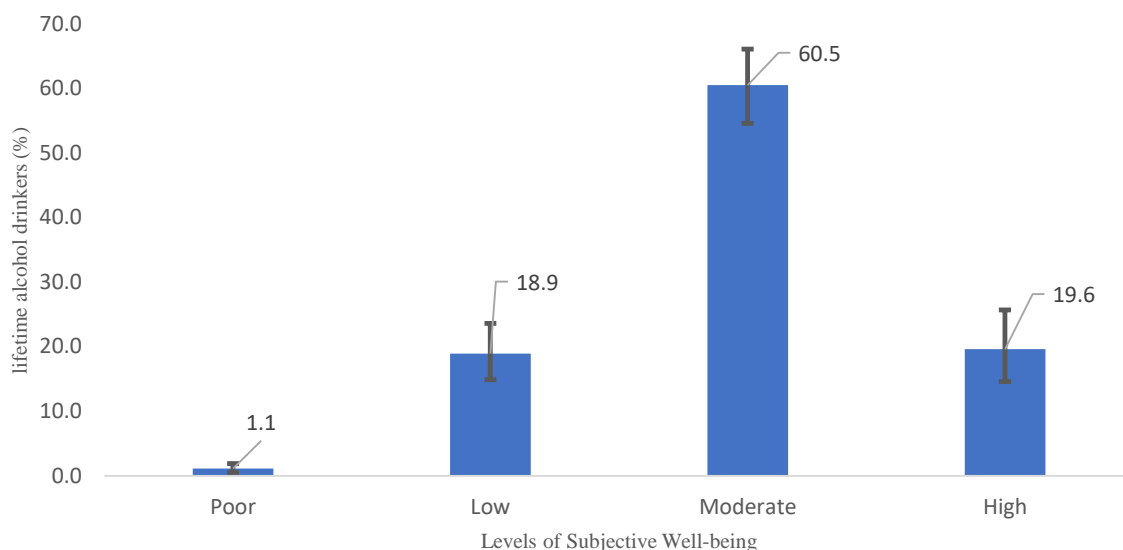
Figure 1. Prevalence of lifetime alcohol consumption by levels of subjective well-being among Ghanaian adults aged 30 years and above with 95% confidence interval. Error bars indicate confidence intervals.

Predictors for the highest level of subjective well-being among older adults aged 30 years and above, with prevalence ratios (PR), following ordered logistic regression at 95% Confidence Interval (CI)

Participants from the Northern region (PR 0.92, CI 0.85-0.99) had significantly lower levels of subjective well-being than individuals from the Greater Accra region, whereas participants from the Upper East region had higher levels of subjective well-being (PR 1.09, CI 1.02-1.16). Participants affiliated with African traditional religion (PR 0.41, CI 0.22-0.77) were significantly more likely to have lower levels of subjective well-being when compared with Christians. Similarly, participants who were separated/divorced (PR 0.70, CI 0.48-0.99) or widowed (PR 0.51, CI 0.39-0.67) had significantly lower levels of subjective well-being in comparison with married individuals. The analysis of the relationship between lifetime alcohol use and subjective well-being yielded conflicting prevalence ratios, with Poisson (PR 1.04, CI 1.01-1.07) and Probit Ordered logistic (PR 0.22, CI 0.05-0.38). In addition, Figure 1 demonstrates that participants with either low or high levels of subjective well-being had a similar prevalence of lifetime alcohol consumption when compared with participants with moderate subjective well-being. Participants over the age of 50 years had significantly lower levels of subjective well-being relative to individuals aged 30 – 39 years; 50 – 59 years (PR 0.67, CI 0.48 - 0.92), 60 – 69 years (PR 0.51, CI 0.35 - 0.73), 70 – 79 years (PR 0.28, CI 0.20 - 0.41), and over 80 years (PR 0.23, CI 0.15 - 0.36).

DISCUSSION

Lifetime alcohol consumption varied considerably by demographic indicators. In this study, we observed the highest lifetime alcohol use in the age group 40 – 49 years, with a subsequent decline in all age groups afterwards. Our data were consistent with other studies, which have recorded a downward trend in alcohol use with increasing age [9,10]. A longitudinal study in the United States involving 8710 participants aged 25–75 years showed that the age decline in alcohol consumption varied by age group, with younger cohorts demonstrating a slower decline in alcohol use over time in comparison with older age groups [11]. As alcohol consumption decreases with advancing age, sensitivity to its toxic effects increases, implying older people may be more vulnerable to the harmful effects of alcohol. Similarly, tolerance decreases with age, further exacerbating its systemic impact [11,12].

In our nationwide study, lifetime alcohol consumption was shown to be more prevalent in men than in women. This male preponderance was also reported by other studies [11,13,14]. Lifetime alcohol consumption and smoking were shown to be significantly related. Generally, drinking and smoking are correlated in communities, with smokers more likely to be drinkers and vice versa [15,16]. However, the combination of smoking and alcohol use tends to exhibit the highest mortality, with studies revealing a three-fold increase in all-cause mortality in comparison with non-smokers and non-drinkers [17,18]. Additionally, a meta-analysis concluded that in comparison with people who have never consumed alcohol, limited alcohol consumption was beneficial [19]. Lack of religious affiliation was

associated with lifetime alcohol consumption in Ghana. This was also observed in SAGE 1 among older adult drinkers, where the proportions of frequent heavy drinkers were lowest among Muslims (13.8%) and highest among those who did not belong to any religion (45.6%) [17]. According to the Ghana Statistical Service Population and Housing Census 2010, the predominant religions included Christian (71.2%), Muslim (17.6%), and traditional religion (5.2%), with 5.3% indicating no religious affiliation [20]. There are several Christian denominations in Ghana. Although Christian denominations and Muslims may be less likely to drink alcohol, the relationship between religion and alcohol is rather complex, modified by the prevailing religious denominations in the country [21,22]. Indeed, the impact of religion on alcohol use has been shown to be greatest among those denominations that strongly prohibit alcohol consumption [23].

Another predictor variable evaluated in this study was the correlation between marriage and alcohol consumption; participants who were divorced or separated were more likely to be drinkers. In previous studies, marital separation had also been shown to be associated with an increase in the incidence of heavy drinking with adverse alcohol-related consequences [24]. Likewise, a decrease in alcohol consumption was associated with transition from being single to married status, with a steeper decline in drinking in the married group than in single adults, emphasising the favourable effects of marriage on alcohol consumption habits [25,26]. Alcohol use has a varied effect on subjective well-being across studies; however, it is worth noting that the outcomes of well-being studies have been discordant, largely due to the application of different study methodologies [27]. For instance, among university students, alcohol use was associated with a greater sense of well-being and a positive effect on life satisfaction [28,29]. Individuals tend to express "happiness" typically when drinking, which does not always endure beyond these episodes [27]. On the contrary, no significant relationship was demonstrated between alcohol drinking and life satisfaction, but there was rather a negative association with well-being in individuals with alcohol-related problems [27]. Similarly, in Ghana, the statistical significance of studies of lifetime alcohol intake and subjective well-being has not been consistent. Furthermore, well-being may reflect one's expectations and is likely to be influenced by cultural heterogeneity of study participants [30,31]. However, there is a yet-to-be-determined threshold where alcohol use becomes counterproductive, subsequently exerting a negative effect on well-being. This is evident in the link between heavy alcohol use and lower subjective well-being with more adverse physical and psychological health outcomes [27].

A study which further stratifies and characterises alcohol intake and problem drinking is necessary. This would further define well-being-related risk in a resource-limited country, where targeted policies towards at-risk groups would be more cost-effective than broader health strategies.

Conclusion

Overall, approximately 1 in 5 study participants were alcohol drinkers. Furthermore, consumers of alcohol were more likely to be male and aged 40 – 49 years. Regional residence and smoking history were further correlates of lifetime alcohol use. Participants aged 50 years of older who were separated, divorced, or widowed had significantly lower levels of subjective well-being. Understanding these sociodemographic factors provides a framework for the development of targeted health policies to safeguard against the deleterious physical and psychological effects of excess alcohol consumption in Ghana.

DECLARATIONS

Ethical consideration
This study utilised data from the WHO SAGE Ghana survey. SAGE was approved by the World Health Organisation's Ethical Review Board (reference number RPC149) and the Ethical and Protocol Review Committee, College of Health Sciences, University of Ghana, Accra, Ghana.

Consent to publish
All authors agreed on the content of the final paper.

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Competing Interest
The authors declare no conflict of interest

Author contribution
TA and VB contributed to conception, study design and methodology. JT performed data analysis under the supervision of KT and TA. TA, VB and AEY contributed to the initial manuscript draft. TA provided a review of the analyses and contributed to manuscript review and editing. All authors read, reviewed and approved the final manuscript.

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Availability of data
Data is available upon request to the corresponding author

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