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RESEARCH ARTICLE

Exploring the association of alcohol consumption, tobacco use, and multimorbidity in a nationally representative sample of South African adults

A Craig[a†], W Mapanga[a,c†], A Mtintsilana[a,b], SN Dlamini[d] and SA Norris[a,e]

[a]*SAMRC/Wits Developmental Pathways for Health Research Unit, University of the Witwatersrand, Johannesburg, South Africa*
[b]*DSI-NRF Centre of Excellence in Human Development, University of the Witwatersrand, Johannesburg, South Africa*
[c]*Strengthening Oncology Services Research Unit, University of the Witwatersrand, Johannesburg, South Africa*
[d]*School of Physiology, University of the Witwatersrand, Johannesburg, South Africa*
[e]*School of Human Development and Health, University of Southampton, Southampton, UK*
Correspondence: Ashleigh.Craig@wits.ac.za

Background: Non-communicable diseases are the leading cause of deaths across the globe and low-to-middle income countries (LMICs) are disproportionally affected. Consequently, people living with multimorbidity or multiple chronic conditions and the potentiating risk factors such as alcohol consumption and tobacco use is increasing in LMICs.
Methods: This study made use of nationally representative data collected from 3 459 South African adults (aged > 18 years) and assessed alcohol consumption, tobacco use, and multimorbidity and explored socioeconomic and demographic associations thereof.
Results: 20.0% of respondents reported having smoked at some point, with the majority of those indicating that they currently smoke (96.1%). Among current smokers, most were classified as light smokers, consuming fewer than 10 cigarettes per day (73.1%). Among alcohol consumers (34.2%), 6.7% of the respondents showed moderate–severe alcohol consumption. When stratified by sex, more men consumed alcohol (by > 16%) than women. Nearly 13% of the total sample reported having multimorbidity, with a larger proportion being women (by 4%) when compared with men. When stratified by urbanicity, nearly 40% of respondents in the urban group reported consuming alcohol compared with the rural group at 28.0%. In multivariable adjusted binary logistic regressions, tobacco use and alcohol consumption increased the likelihood of reporting multimorbidity ($p < 0.001$) when compared with their counterparts. Consuming a moderate–severe level of alcohol increased the likelihood of multimorbidity twofold ($p < 0.001$) in those who reside in urban areas and more than threefold ($p < 0.001$) in those who reside in rural areas when compared with those who do not consume alcohol. All associations are independent of other sociodemographic determinants.
Conclusion: This study highlights the complex relationship between lifestyle factors and multimorbidity and the potential effect of urbanicity and sociodemographic characteristics on these relationships. Public health interventions targeted at the consumption of alcohol therefore need to be upscaled in these settings.

Keywords: alcohol, tobacco, multimorbidity, national survey, South Africa

Introduction

Non-communicable diseases (NCDs) or chronic ailments are a burden seen worldwide,[1] presumably due to certain demographic and health transitions. Globally, NCDs are the leading cause of death and account for nearly 70% of all reported deaths,[2] of which an estimated three-quarters occur in low-to-middle-income countries (LMICs) like South Africa.[3] Consequently, the proportion of people living with multimorbidity – that is, having 2 or more concurrent ailments[4] – is increasing and is likely to pose a serious health-related and financial burden on the already weakened healthcare systems in these settings.[5,6]

There has been a considerable increase in the prevalence of multimorbidity and its potentiating risk factors in the past decade. Excessive alcohol consumption[7] and tobacco smoking[8] are common risk factors across sub-Saharan Africa. According to a recent national survey carried out in South Africa, alarmingly, 33.2% of the adult population (> 18 years) consumed alcohol and of those, 31.4% reported hazardous or harmful alcohol use.[9] Not only is alcohol use considered a major potentiating factor in multimorbidity as reported in numerous studies[10–12] but harmful use of alcohol can also exacerbate and further complicate the management of existing ailments (i.e. cardiovascular disease[13]).[14] For instance, Parry *et al.* reported that alcohol use is linked to increased risk of several cancers, cardiovascular conditions (i.e. hypertension), and liver disease.[15] Furthermore, alcohol has also been found to contribute significantly to the global NCD burden – accounting for 3.4% of deaths, 5.0% of net years of life lost, and 2.4% of net disability adjusted life years, with the highest impact from cancer and liver cirrhosis.[15] In a South African study that assessed the association of alcohol and multimorbidity in rural adults (> 40 years), alcohol use was a commonly reported habit and associated with multimorbidity (including and excluding HIV).[16] This finding underscores the need for integrated screening, interventions, and treatment strategies to mitigate multimorbidity in this population.

Geographic location is an important factor in assessing one's behavioural traits. Certain factors associated with living in urban versus rural areas may increase risk, while others (i.e.

[†]These authors contributed equally.

the low or decreased availability of alcohol or tobacco, social norms for acceptable drinking behaviours, demographic characteristics, and/or economic factors) may be protective.[17] Urban–rural disparities in multimorbidity have been well documented in previous studies.[18–20] At the same time, the United Nations Sustainable Development Goals highlight the need to expand treatment for substance use disorders, yet global data show that coverage remains persistently low – especially in LMICs, which comprise much of the world's population.[21] This gap is driven by limited recognition of treatment need, restricted access to services, and inadequate quality of care.[21] These findings provide an important baseline for monitoring progress and highlight the urgent need for coordinated efforts to meet the 2030 targets.

This large-scale, nationally representative study, therefore, assessed alcohol and tobacco use and multimorbidity among South African adults and explored socioeconomic and demographic associations thereof. This study provides important evidence for understanding lifestyle risk factors (i.e. alcohol use and tobacco exposure) in adulthood that is strongly linked to multimorbidity, which may assist in identifying mechanisms of these associations, and aid in developing targeted intervention strategies to reduce the risk of multimorbidity in South Africa. The data were also disaggregated by urbanicity to assess the impact of alcohol use on multimorbidity in those who reside in urban and rural settings.

Methodology

Study design

This cross-sectional study surveyed a nationally representative sample of adults (> 18 years old). Data collection took place during May/June 2022 and was carried out by a team of experienced fieldworkers across the nine provinces of South Africa. Interviews were conducted with 3 459 participants across the country as outlined in Figure 1.

Survey

Data collection took place through face-to-face interviews with the use of computer-assisted personal interviewing technology as described elsewhere.[9,22] In brief, the survey included questions pertaining to respondent and household demographics. Province and community size (urban [including metropolitan, city and/or towns] and rural [including villages]) were recorded and information collected on household assets, age, sex, employment status, marital status, education attained, and health-related questions (multimorbidity). A household asset score was computed in alignment with the Demographic and Health Surveys household questionnaire and used as an indicator of socioeconomic status (SES) in this study. This included a tally of all major operational household amenities (e.g. refrigerator, washing machine, television, computer etc). In this cross-sectional study, household asset score tertiles were computed and used as an indicator of economic differentiation.[23–25]

The study obtained approval from the Human Research Ethics Committee (Non-Medical) of the University of the Witwatersrand, SA (H21/06/36). Written informed consent was obtained from each respondent.

The survey also included 10 questions from the World Health Organization Alcohol Use Disorders Test (WHO-AUDIT)[26] to assess alcohol consumption. A score of 1–7 suggested low-risk consumption according to WHO guidelines. Scores from 8 to 14 suggested hazardous or harmful alcohol consumption and a score of 15 or more indicated the likelihood of alcohol dependence.[26] Likewise, with the use of the US Centre for Disease Control (CDC) Global Adult Tobacco Survey,[8] tobacco use information was collected. Tobacco usage was categorised into 3 groups, namely, those who do not smoke (group 1: never); those who smoke 10 or fewer cigarettes per day (group 2: light smokers), and those who smoke more than 10 cigarettes per day (group 3: heavy smokers).

To assess the overall health of the respondent, respondents were asked a series of health-related questions regarding confirmed ailments (i.e. heart attack, stroke, high cholesterol, diabetes, overweight/obesity, HIV/AIDS, asthma/chronic obstructive pulmonary disease, sore joints/muscle problems [i.e. arthritis, gout], tuberculosis, cancer, liver disease, mental health [i.e. depression, anxiety, bipolar], chronic kidney disease, hypertension/high blood pressure). An overall multimorbidity score was calculated based on the sum of confirmed aliments. To ensure comparability of the findings of this study with previous studies assessing multimorbidity,[16,27] multimorbidity was therefore categorised into two groups, either multimorbidity including HIV/AIDS or multimorbidity excluding HIV/AIDS.

Statistical analyses

For all statistical analyses, IBM® SPSS® version 28 (IBM Corp, Armonk, NY, USA) and GraphPad Prism version 5.03 for Microsoft® Windows (GraphPad Software, San Diego, CA, USA) were used to analyse and plot the data. Additionally, QGIS (Penn Libraries, Philadelphia, PA, USA) was used to plot and scale Figure 1, the geographical location of the South African provinces.

All statistics were weighted to represent the most recent census of the South African population (18 years or older). The weighted matrix factored in age, sex, population group, home language,, and provincial distribution. Proportions across sociodemographics (age, sex, marital status, education level, employment, household assets, and urbanicity) and provinces were determined with crosstabs with significant differences indicated by chi-square tests and presented as percentages. Multivariable adjusted binary logistic regressions were performed to determine the odds of multimorbidity in adulthood with either alcohol use, tobacco use, and sociodemographic contributors (age, sex, marital status, education level, employment, SES, and urbanicity) as confounders. Additionally, further multivariable adjusted binary logistic regressions were conducted with alcohol use and sociodemographic contributors in different urbanistic regions to assess the impact of urbanicity on the association of alcohol use and multimorbidity. Multivariable adjusted binary logistic regressions are presented as odds ratios with corresponding confidence intervals. To enhance the relevance of our findings, alcohol use was re-categorised into three groups for the statistical analyses to reflect differing levels of consumption: Group 1 included respondents who reported never consuming alcohol; Group 2 combined those scoring between 1 and 14 on the WHO AUDIT, representing occasional to moderate use (low-moderate risk); and Group 3 included those who scored 15 or higher, indicative of alcohol dependence (moderate–severe risk). This grouping allowed us to distinguish between non-use, lower-risk occasional use, and higher-risk/dependent patterns of alcohol consumption.

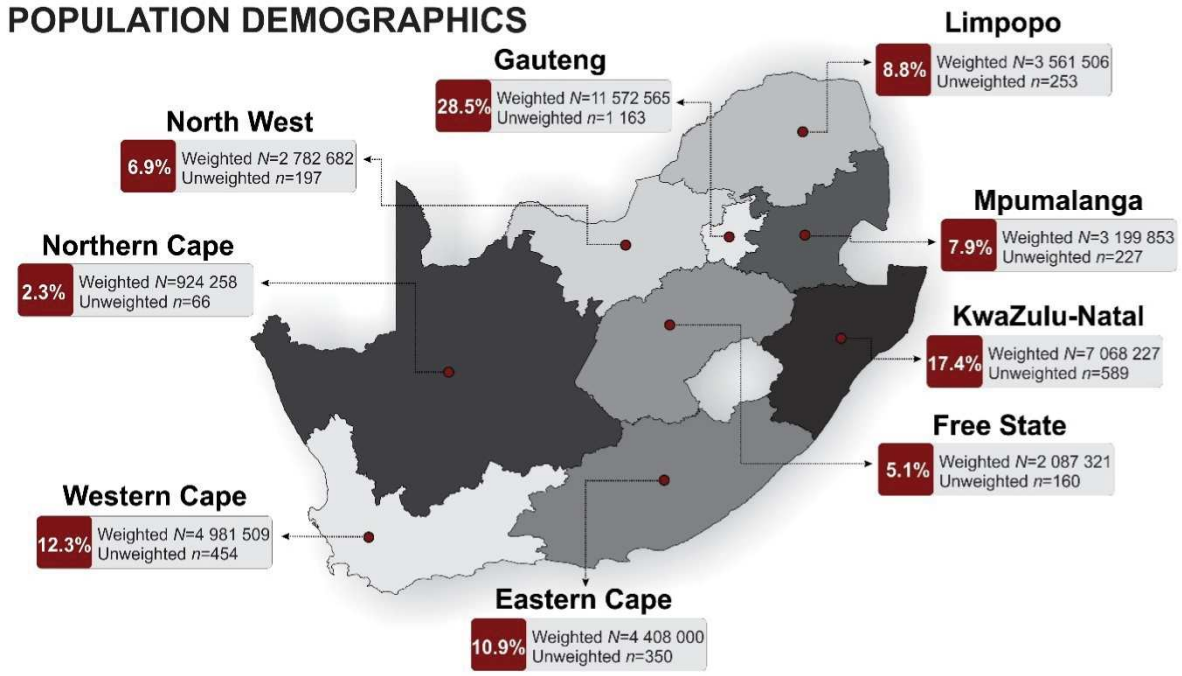

Figure 1: Population demographics outlining the nine provinces of South Africa.

Results

General descriptives

Table 1 outlines the general descriptives of the total sample of survey respondents ($n = 3\ 459$; female: 50.7%; male: 49.3%). Respondents were predominantly aged 25–34 years (29.4%) with the largest proportion of respondents being single (57.8%), employed (51.6%), having an education level of graduated high school or equivalent (54.2%), and/or with an SES score in the middle tertile (40.6%).

Tobacco, alcohol use, and multimorbidity

Some 20.0% of the respondents reported that they had ever smoked with 96.1% of those reporting that they currently smoke; 34.2% of the total sample reported consuming alcohol, of whom 10.0% and 6.7% of the respondents showed hazardous/harmful or severe alcohol consumption, respectively. Additionally, nearly 13% of the total sample reported having multimorbidity (either including or excluding HIV/AIDS). When stratified by sex (Table 1), more men consumed alcohol (43.0%) when compared with their female counterparts (26.1%). A larger proportion of women reported having multimorbidity (by 4%) when compared with men.

Urbanicity

Respondents predominantly resided in the Gauteng province (28.5%), as shown in Figure 1. Table 1 shows that nearly three-quarters of the total respondents reside in urban areas (urban: 69.3%; rural: 30.7%). Urbanicity was comparable between men and women (urban: men (69.9%), women (68.7%); rural: men (30.1%), women (31.3%)). Sociodemographic correlates (Supplementary Table S1) between the urbanistic groups showed the majority of the respondents were employed (urban: 52.1%; rural: 41.6%), educated to a high school level or equivalent (urban: 54.3%; rural: 49.3%), and/or reported a marital status of being single (urban: 55.1%; rural: 65.2%). Respondents in the urban group were predominantly aged 35–44 years (28.4%) while respondents in the rural group were younger at 25–34 years (28.4%). A large proportion of respondents in the urban group had an SES in the middle tertile (45.0%), while respondents in the rural group predominantly reported an SES in the lower tertile (73.0%). Nearly 40% of respondents in the urban group reported consuming alcohol, which was higher than that reported in the rural group (28.0%) ($p < 0.001$). Lastly, more respondents reported multimorbidity in the urban (14.0%) versus rural (13.6%) group ($p < 0.001$).

Associations of multimorbidity, alcohol, tobacco and socio-demographics

As outlined in Figure 2 and Supplementary Table S2, we performed multivariable adjusted binary logistic regressions to determine the odds of having multimorbidity either including or excluding HIV/AIDS with differing levels of alcohol use (model 1a) or tobacco smoking (model 1b), independent of sociodemographic characteristics (age, marital status, education level, employment, SES, and urbanicity). We determined that low to moderate alcohol consumption increased the likelihood of reporting multimorbidity (including HIV/AIDS: OR, 1.128 [95% CI 1.125; 1.313]; excluding HIV/AIDS: OR, 1.191 [95% CI 1.188; 1.194]) by > 13% when compared with those who do not consume alcohol. Similarly, light smoking increased the likelihood of multimorbidity (including HIV/AIDS: OR, 1.307 [95% CI 1.288; 1.327]; excluding HIV/AIDS: OR, 2.233 [95% CI 2.188; 2.279]) when compared with non-smokers. Interestingly, the likelihood of consuming alcohol on a moderate to severe level or heavy tobacco smoking increased the likelihood of reporting multimorbidity (moderate–severe: including HIV/AIDS: OR, 3.002 [95% CI 2.993; 3.012]; excluding HIV/AIDS: OR, 2.870 [95% CI 2.860; 2.880]; heavy smokers: including HIV/AIDS: OR, 1.675 [95% CI 1.649; 1.701]; excluding HIV/AIDS: OR, 2.979 [95% CI 2.918; 3.041]) by multiple times when compared with those who do not consume alcohol or those who do not smoke. These associations were independent of other sociodemographic determinants.

Table 1: General descriptives of the South African survey respondents ($n = 3\ 459$).

Item		Women		Men		Total population	
		Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Age categories							
18–24 years	%	14.4	17.6	18.6	23.0	16.5	20.2
25–34 years	%	30.2	30.1	28.5	27.2	29.4	28.7
35–44 years	%	28.5	23.4	26.0	20.8	27.3	22.1
45–54 years	%	16.5	14.7	17.8	15.4	17.1	15.0
55–64 years	%	7.3	10.4	7.0	10.5	7.1	10.5
65 + years	%	3.1	3.9	2.1	3.1	2.6	3.5
Sex distribution							
Male	%	–	–	–	–	49.3	47.8
Female	%	–	–	–	–	50.7	52.2
Employment status							
Unemployed	%	43.1	43.5	30.9	30.4	37.1	37.2
Employed	%	46.9	44.4	56.5	53.8	51.6	48.9
Student	%	5.5	6.4	8.3	10.0	6.9	8.1
Retired	%	4.5	5.7	4.3	5.9	4.4	5.8
Education attained							
Uneducated/Partial primary	%	1.9	2.9	1.6	2.8	1.8	2.9
Primary school	%	1.8	2.1	1.9	2.3	1.8	2.2
Partial secondary	%	21.8	23.5	21.0	21.1	21.4	22.3
NSC/Short course	%	55.4	53.4	52.9	52.0	54.2	52.8
Tertiary	%	19.2	18.0	22.6	21.9	20.9	19.8
Marital status							
Single	%	54.6	55.3	61.2	61.4	57.8	58.2
Married/co-habiting	%	36.6	35.1	35.3	34.8	36.0	34.9
Widowed/ divorced/ separated	%	8.8	9.6	3.5	3.8	6.2	6.9
Socioeconomic status							
Lower tertile	%	35.6	40.0	33.2	35.5	34.4	37.8
Middle tertile	%	40.5	38.5	40.7	39.0	40.6	38.7
Upper tertile	%	23.9	21.5	26.1	25.5	25.0	23.4
Urbanicity							
Urban	%	74.4	68.7	74.1	69.9	74.3	69.3
Rural	%	25.6	31.3	25.9	30.1	25.7	30.7
Alcohol consumption							
Yes	%	27.3	26.1	46.1	43.0	36.6	34.2
No	%	72.7	73.9	53.9	57.0	63.4	65.8
Alcohol use							
Never	%	72.7	73.9	53.9	57.0	63.4	65.8
Low risk	%	16.1	15.5	20.8	19.8	18.4	17.6
Hazardous/harmful	%	6.4	5.9	16.0	14.4	11.1	10.0
Severe	%	4.8	4.6	9.3	8.9	7.1	6.7
Tobacco use							
Have you ever smoked (whole sample)?							
Yes	%	10.0	10.0	32.3	30.8	20.9	20.0
No	%	90.0	90.0	67.8	69.2	79.1	80.0
Have you smoked cigarettes in the past year (among the respondents who reported that they have ever smoked)?							
Yes	%	94.3	95.6	96.0	96.2	95.6	96.1
No	%	5.7	4.4	4.0	3.8	4.4	3.9
Tobacco smoking exposure							
Non-smoker	%	5.7	4.4	4.0	3.8	4.4	3.9
Light smoker	%	70.7	68.2	75.2	75.4	74.2	73.7
Heavy smoker	%	23.6	27.5	20.8	20.8	21.4	22.4

(*Continued*)

Table 1: Continued.

Item		Women		Men		Total population	
		Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
Multimorbidity							
Including HIV/AIDS	%	15.2	15.8	10.2	11.8	13.9	12.7
Excluding HIV/AIDS	%	14.2	14.9	9.4	11.0	13.0	11.8

Alcohol use was categorised into three groups based on those respondents who either did not consume alcohol (never); those with low to moderate alcohol consumption (low–moderate); and those who with moderate to severe alcohol consumption (moderate–severe). Tobacco exposure was categorised into three groups, namely those who are non-smokers; those who smoke fewer than 10 cigarettes/day (light smokers; and those who smoke 10 or more cigarettes/day (heavy smokers). Multimorbidity (≥ 2 concurrent morbidities) was categorised into two groups: multimorbidity including HIV/AIDS and multimorbidity excluding HIV/AIDS. Abbreviations: *n*: number of participants; %: percentage; NSC: national senior certificate.

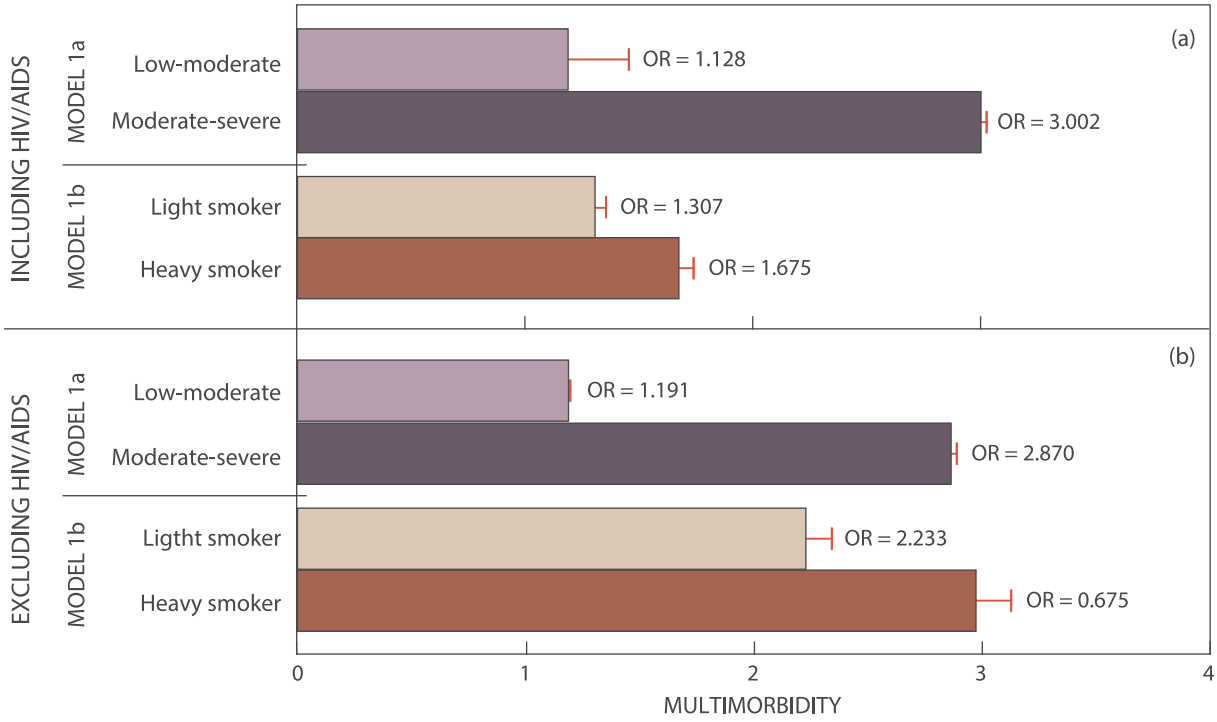

Figure 2: Multivariable adjusted logistic regression showing the associations of multimorbidity (a) including HIV/AIDS and (b) excluding HIV/AIDS with alcohol use (model 1a) and smoking (model 1b). Red error bars represent 95% CI for the OR. Full multivariable logistic regressions as well as values for the 95% CI are presented in Table S1 of the Supplementary data. Reference variables in the model include respondents who do not consume alcohol and those who do not smoke. Alcohol use was categorised into three groups based on those respondents who either did not consume alcohol (never); those with low to moderate alcohol consumption (low–moderate); and those with moderate to severe alcohol consumption (moderate–severe). Tobacco exposure was categorised into three groups, namely those who are non-smokers; those who smoke fewer than 10 cigarettes/day (light smokers); and those who smoke 10 or more cigarettes/day (heavy smokers). OR: odds ratio.

We further repeated the multivariable adjusted binary logistic regressions, as shown in Figure 3 and Supplementary Table S3, to assess whether the likelihood of alcohol use and multimorbidity differed in those who reside in urban versus rural areas. Our results found that consuming a moderate to severe level of alcohol (i.e. being alcohol dependent) increased the likelihood of multimorbidity twofold (including HIV/AIDS: OR, 2.685 [95% CI 2.674; 2.696]; excluding HIV/AIDS: OR, 2.453 [95% CI 2.443; 2.464]) in those who reside in urban areas and more than threefold (including HIV/AIDS: OR, 3.218 [95% CI 3.200; 3.235]; excluding HIV/AIDS: OR, 3.440 [95% CI 3.420; 3.460]) in those who reside in rural areas when compared with those who do not consume alcohol. Again, the associations in the model are independent of other sociodemographic determinants.

Discussion

Our study aimed to assess alcohol and tobacco use and multimorbidity among South African adults and explore socioeconomic and demographic associations thereof. The findings of this study revealed several noteworthy relationships and patterns that contribute to the understanding of the complex interplay between lifestyle in adulthood and multimorbidity. Our study indicated that 20% of the sample ever smoked with 96.1% of these respondents currently smoking. Some 34% of the population reported consuming alcohol and nearly 13% of the sample reported having multimorbidity (either including or excluding HIV/AIDS).

The majority age distribution of our study population indicated a substantial representation of relatively young adults aged 25–34 years and previous research has indicated that this age group is vulnerable to various lifestyle-related health risks including alcohol and tobacco abuse.[28,29] Furthermore, a significant proportion of the respondents were employed, had a high school or a higher qualification, were single, and/or middle class (SES). These socioeconomic and demographic characteristics mirror those commonly observed in urban populations and have been reported to be implicated in health behaviours and outcomes.[30–32]

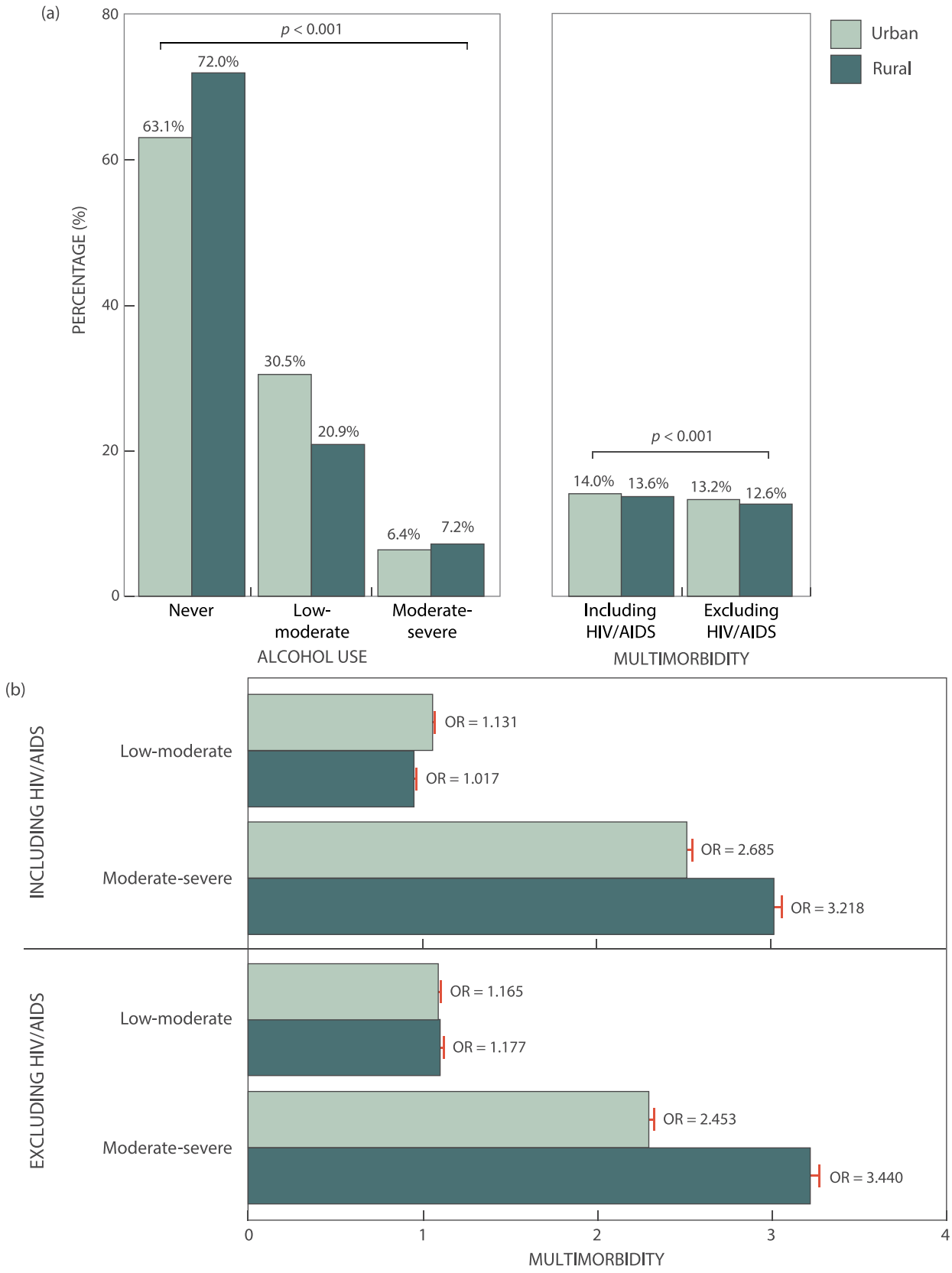

Figure 3: Alcohol use and multimorbidity in the total population stratified by urbanicity. (a) Weighted descriptives of alcohol use and multimorbidity. (b) Multivariable adjusted logistic regression showing the associations of multimorbidity with alcohol use. Reference variables in the model include respondents who do not consume alcohol. Alcohol use was categorised into three groups based on those respondents who either did not consume alcohol (never); those with low to moderate alcohol consumption (low–moderate); and those with moderate to severe alcohol consumption (moderate–severe). Multimorbidity (≥ 2 concurrent morbidities) was categorised into two groups: multimorbidity including HIV/AIDS and multimorbidity excluding HIV/AIDS. OR: odds ratio.

Our study findings also highlighted one in five respondents had ever smoked, a high prevalence of alcohol use, and nearly 13% of survey respondents reported multimorbidity, a finding that is consistent with evidence suggesting an ever-increasing prevalence of people with multiple health conditions.[16,33,34] Furthermore, the significant association between tobacco smoke, alcohol consumption, and multimorbidity in our study supports evidence of the link between lifestyle factors and multimorbidity, and this phenomenon is also common among middle-aged people.[35,36] Our findings highlighted that low to moderate alcohol consumers and those who reported light cigarette smoking reported the likelihood of multimorbidity, even after controlling for sociodemographic characteristics. Interestingly, multimorbidity was even more pronounced among those who reported heavy alcohol consumption or tobacco smoking. This underscores the need for targeted interventions to address substance use, especially before middle-age adulthood, to prevent the debilitating effects of multimorbidity when these individuals are elderly.[37]

Sex-specific differences in tobacco smoking, alcohol consumption, and multimorbidity were also identified in our study. Although men were more likely to smoke and consume alcohol and report hazardous drinking compared with women, it was women who exhibited a slightly higher prevalence of multimorbidity. The finding of higher alcohol consumption among men is in line with a previous finding which reported that binge drinking was more prevalent among individuals in younger age groups, males, and African populations.[38] These sex-based disparities may be attributed to various societal, economic, and cultural factors influencing health-seeking and behaviour patterns. For example, research suggests that a key driver of rising alcohol consumption in Africa is the aggressive marketing tactics employed by the alcohol industry[39–41] and in many societies, including those in South Africa, smoking has traditionally been associated with masculinity and the social norm.[42] Additionally, gender roles and expectations have shaped behaviours over time, with men having greater access to tobacco products and more acceptance in smoking in public spaces.[43] Additionally, among middle-aged Canadians, evidence suggested that women on low income had higher odds of multimorbidity[36] and this was also reported in Botswana, where women had significantly higher odds of multimorbidity than men.[33] Therefore, longitudinal research is needed to better understand these differences between men and women, and this might help to inform tailored interventions aimed at reducing tobacco use, alcohol consumption, and multimorbidity within gender groups.

The present study revealed interesting patterns of sociodemographic correlates of urbanicity, with those who reported being residents of urban areas in South Africa more likely to be educated and employed,[44,45] mirroring trends observed in high-income countries such as the United States and European nations.[46,47] Therefore, urban residents in South Africa were more likely to consume higher quantities of alcohol and report multimorbidity when compared with their rural counterparts. This urban–rural divide in health outcomes is not unique to South Africa but is consistent with previous research conducted in high-income countries as well. Studies in countries like the United Kingdom and Australia[48–50] have also indicated that urban dwellers tend to have higher rates of multimorbidity, which might be attributed to increased levels of development, greater availability of advanced healthcare facilities, but also exposure to unhealthy diets, the globalisation of product marketing (including alcohol, tobacco, and unhealthy food), and the consequences of unplanned urbanisation.[51] Furthermore, this study found that moderate–severe alcohol consumption was associated with higher odds of multimorbidity among both urban and rural residents in South Africa, a pattern that is also observed in high-income countries. Therefore, the potential compounding effects of alcohol consumption on health outcomes in both rural and urban settings should be emphasised not only in South Africa but also in high-income countries, underscoring the need for region-specific interventions that account for these shared challenges in different socioeconomic contexts.

This study must be interpreted in the context of its strengths and limitations. It is strengthened by its use of nationally representative data, including respondents from all nine provinces of South Africa, weighted accordingly to be representative of South Africa's adult population. Data collection was strengthened by the fact that the field staff went through extensive training. This national survey includes the use of self-reported questionnaires (both mental health and multimorbidity), which may pose recall bias.[52] It is known that respondents will report experiences that are more socially acceptable and/or preferred, thus we acknowledge this as a limitation of this study. By including common behaviours such as alcohol consumption and tobacco use and multimorbidity, the study provides evidence for the contribution of unfavourable lifestyle/behaviours to multimorbidity, over and above contemporary sociodemographics.

In conclusion, this study provides further evidence of the intricate relationships between lifestyle factors (more alcohol consumption) and multimorbidity and highlights the effect of urbanicity and sociodemographic characteristics on this relationship. These findings underscore the need for targeted public health interventions to address alcohol use and abuse and its implications for multimorbidity while considering the nuanced influences of sex and urbanicity. Future longitudinal research could try and understand the underlying mechanisms driving these associations and explore strategies to mitigate multimorbidity outcomes observed in this study population.

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Statement of ethics – The study authors obtained approval from the Human Research Ethics Committee (Non-Medical) of the University of the Witwatersrand, South Africa (H21/06/36). Written informed consent was obtained from each respondent.

Data availability statement – All data generated or analysed during this study are included in this article. Further enquiries may be directed to the corresponding author.

Authorship contributions – All authors were involved in the conception and planning of the study and interpretation of the results. SAN was responsible for oversight of data collection. AC carried out the data analyses and generated tables. AC and WM interpreted the data, did the literature search, and the writing of the paper. All authors interpreted the data and made a significant contribution to the interpretation of the results. All authors were responsible for revising the manuscript and approving the submitted version.

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ORCID

A Craig http://orcid.org/0000-0002-7641-5953

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