



BMJ Open Prevalence of and factors associated with tobacco smoking in the Gambia: a national cross-sectional study

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ABSTRACT

Objectives To examine the prevalence of and risk factors associated with tobacco smoking in the Gambia.

Design A nationwide cross-sectional study.

Setting The Gambia.

Participants The study participants were both women and men aged between 15 and 49 years old. We included 16,066 men and women in our final analysis.

Data analysis We analysed data from the Gambia Demographic and Health Survey (DHS), 2019–2020. DHS collected nationally stratified data from local government areas and rural–urban areas. The outcome variable was the prevalence of tobacco smoking. Descriptive analysis, prevalence and logistic regression methods were used to analyse data to identify the potential determinants of tobacco smoking.

Results The response rate was 93%. The prevalence of current tobacco smoking was 9.92% in the Gambia in 2019–2020, of which, 81% of the consumers smoked tobacco daily. Men (19.3%) smoked tobacco much higher than women (0.65%) ($p < 0.001$). People aged 40–49 years, with lower education, and manual workers were the most prevalent group of smoking in the Gambia ($p < 0.001$). Men were 33 times more likely to smoke tobacco than women. The chance of consuming smoked tobacco increased with the increase of age (adjusted OR (AOR) 9.08, 95% CI 5.08 to 16.22 among adults aged 40–49 years, $p < 0.001$). The strength of association was the highest among primary educated individuals (AOR 5.35, 95% CI 3.35 to 8.54).

Manual workers (AOR 2.73) and people from the poorest households (AOR 1.86) were the risk groups for smoking. However, place of residency and region were insignificantly associated with smoking in the Gambia.

Conclusions Men, older people, manual workers, individuals with lower education and lower wealth status were the vulnerable groups to tobacco smoking in the Gambia. Government should intensify awareness programmes on the harmful effects of smoking, and introduce proper cessation support services among tobacco smoking users prioritising these risk groups.

INTRODUCTION

Tobacco use is the second-ranked leading risk factor of mortality, accounting for 8.71 million fatalities worldwide (15.4% of total deaths) in 2019.¹ It is attributed to about 100 million

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study analysed data drawn from nationally representative surveys to investigate the prevalence of and risk factors associated with tobacco smoking in the Gambia.
- ⇒ We included all relevant sociodemographic predictor variables and ran a series of models applying a complex survey design, controlling for potential confounding factors and multicollinearity to reach a final parsimonious model.
- ⇒ The cross-sectional nature of the data in this study does not reveal a causal association.

deaths in the 20th century, the vast majority of which occurred in developed countries.^{2,3} If the current trends of smoking persist, tobacco will kill around one billion people this century, with the bulk of deaths occurring in low-income and middle-income countries.^{2–5} Along with the health consequences, tobacco smoking caused significant economic costs: yearly, it exceeds US\$1 trillion.⁶

The burden of tobacco use is increasing in low-income and middle-income countries. In 2019, around 77.5% (around 6 of 7.69 million) of total tobacco smoking-related death occurred in low-income and middle-income countries. The number of smokers has also increased by 75% in sub-Saharan Africa (68.7% in the Gambia) since 1990. Age-standardised prevalence of tobacco smoking in the Gambia had 1.6 times compared in neighbouring country, Senegal, in 2019 (12.5%).⁷ Every day, 105 000 adults use tobacco in this country. Around 98.9% of users consumed tobacco smoking. Tobacco smoking caused 4.5% (7.9% in men and 0.5% in women) of death among the Gambians in 2019, while the smoking-attributable death increased 38% since 1990.⁷ Tobacco smoking costs around US\$5 million in its economy every year.⁶ Tobacco smoking increases the chance of non-communicable diseases such as cardiovascular diseases, cancer and chronic

respiratory diseases.^{8 9} These three non-communicable diseases cause 20% of all deaths in the Gambia.¹⁰ WHO set a target of a 25% decrease in deaths from cardiovascular diseases, diabetes, cancer and chronic respiratory illnesses among people aged 30–70 from 2010 to 2025.¹¹ To reach the global target of non-communicable diseases in the Gambia, reducing tobacco smoking can be the single best preventive and cost-effective strategy.

A study conducted among the Gambian men reported that 31.4% of men aged 25–64 years old smoked tobacco in 2010.¹² Another study carried out in this country among students aged 12–20 years old found that 16.7% of students consumed tobacco in 2016.¹³ Nevertheless, the prevalence of and factors associated with tobacco smoking based on up-to-date data among both men and women and nationally representative data were not available in The Gambia. Up-to-date knowledge of the smoking prevalence and risk factors can inform policy-makers to design policies and interventions to accelerate smoking cessation. Therefore, to address this knowledge gap, we aimed to examine the prevalence of tobacco smoking among different socio-demographic groups' levels and factors associated with tobacco smoking in the Gambia using the Demographic and Health Survey (DHS) 2019–2020 data.

METHODS

Study design and data source

We analysed data from the Gambia DHS, 2019–2020. DHS is a nationally representative data stratified by local government areas (LGAs) and rural–urban areas.¹⁴ The sample was two stages cluster in design. The sampling unit was the enumeration area (EA) that was selected based on the 2013 Population and Housing Census conducted by the Gambia Bureau of Statistics. In the first stage of sampling, 281 EAs were obtained from the sample frame. The sample had 14 strata, 12 strata from 6 LGAs (urban and rural) and 2 in municipalities (Banjul and Kanifing, no rural area in municipalities). In the second stage, systematic random sampling was used to choose a fixed number of 25 households from each EA. Trained data collectors interviewed only in preselected households. The sampling selection method is illustrated in [figure 1](#). The detailed sampling procedure is given in the DHS final report in 2019–2020.¹⁴ In this study, the Strengthening the Reporting of Observational Studies in Epidemiology statement was followed.¹⁵

Study population

Women aged 15–49 years and men aged 15–59 years were interviewed using separate questionnaires during data collection in the Gambian DHS. However, we analysed data of both participants aged between 15 and 49 years to get a pooled estimate.

Outcome variables

The outcome was the prevalence of current tobacco smoking in this study. Respondents were asked, 'Do you

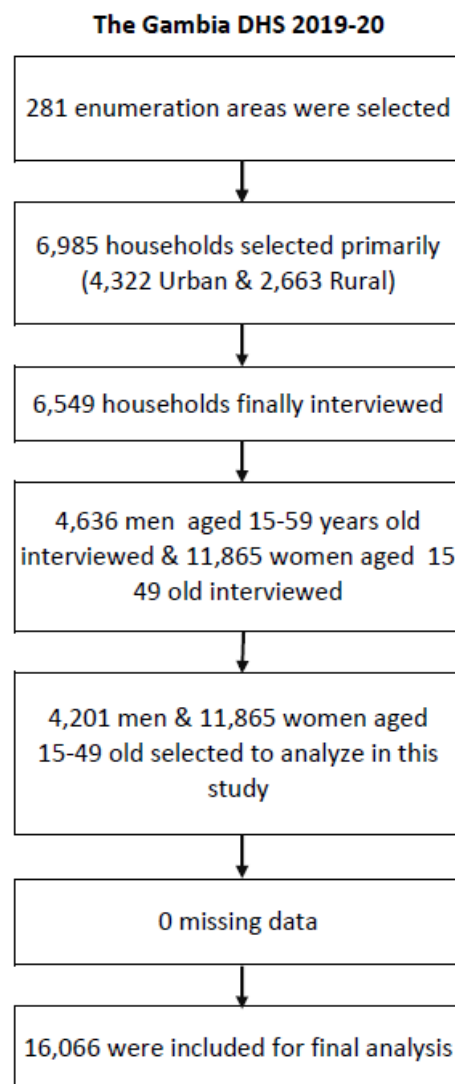


Figure 1 Flow chart of selection of sample. DHS, Demographic and Health Survey.

currently use smokeless tobacco (SLT) every day, some days or not at all?' The response was taken as 'every day', 'some days' or 'not at all'. We made the response dichotomous by coding 'every day' and 'some days' responses as 'yes' and 'not at all' as 'no'. Smoked tobacco included manufacture, hand-rolled cigarettes, e-cigarettes, pipe full of tobacco, cigars and cheroots tobacco forms.

Independent variables

We identified tobacco smoking variables based on prior research on tobacco usage in the sub-Saharan African region.^{16–18} The independent variables were age, sex, union with men/women, ethnicity, religion, parity, place of residence, region (LGA), education level, occupation, wealth status and access to information (television, radio and newspapers). Age was grouped as 15–19, 20–29, 30–39 and 40–49. Both men and women were included in this study. Union status of respondents are either categorised as 'never union' and 'currently/formally union'.

'Never union' is defined as respondents who were unmarried and never lived together with men/women in her/his life. Ethnic groups were grouped into five categories (non-Gambian, Mandinka/Jahanka, Wolof, Fula/Tukulur/Lorobo and others).

The religion of participants was categorised as Islam and others. The parity of respondents was grouped into three categories (respondents with no child, one child and one+children). Rural and urban areas were the place of residence. Regions were six LGAs and two municipalities. Education level was grouped into four categories, no education (0 schooling year), primary (1–5 schooling years), secondary (6–12 schooling years) and higher (12+ schooling years). Occupation of respondents was divided as not working, professional/technical/managerial/clerk/sales/services/armed forces/other, agriculture and skilled/unskilled manual categories. The wealth status of households was grouped into five quintiles (poorest, poorer, middle, richer and richest). Implementing partners of the DHS programme classified wealth status depending on the household asset and dwelling characteristics. Information access, newspapers/magazines, television and radio were all divided into three categories (not use at all, less than once a week, at least once a week).

Statistical analysis

We performed descriptive statistics to assess the distribution of participants and presented them as frequencies (n) and proportions (%). The prevalence of tobacco smoking was estimated among the independent variables. The prevalence was reported as a percentage with the 95% CI. To examine the relationship between variables and tobacco smoking, we used the χ^2 test. We also conducted univariable and multivariable logistic regression to investigate factors of tobacco smoking, presented as unadjusted OR, and adjusted OR (AOR) with 95% CIs and p value. All of the analyses were two tailed. Statistical significance was defined as a p value of less than 0.05. Multicollinearity of independent variables was checked. The prevalence, univariable, multivariable regression model took into account the complicated sample design and sampling weight (weight was adjusted for women and men). Missing values were excluded before conducting the final analysis (figure 1). The statistical program R V.4.0 was used to analyse the data.

Patient and public involvement

No patient was involved.

RESULTS

Sociodemographic characteristics

The response rate was 93%. Of the 16066 participants, 73.9% were women. A total of 35.2% of participants' age was between 20 and 29 years, and 65.1% were currently or formally in a union with men or women. The majority of participants were from the Islam (97.5%) religion, while

the Mandinka/Jahanka (30.7%) group was the majority in ethnic background. Almost half of the participants had more than one child. About 56.1% of respondents were living in rural areas, and one in five participants was from the Brikama region (LGA). In socioeconomic position, only 6% (970) of the participants had a higher level of education, and 40.2% of them were involved in professional/technical/managerial/clerk/sales/services/armed forces works, while 27.4% of respondents were from the poorest households (table 1).

Prevalence of tobacco smoking

The prevalence of any type of tobacco useage among all adults aged between 15 and 49 years was 9.94%, while 9.92% and 0.08% of adults used smoked and SLT, respectively, in the Gambia in 2019–2020. However, 81% of users smoked tobacco daily (data not shown). The prevalence of any tobacco consumption among men was 30 times higher than women (19.3% vs 0.65%). Smoking prevalence among men was 19.26% (95% CI 17.35% to 21.27%) and among women was 0.60% (95% CI 0.41% to 0.85%). Regarding smoking forms of tobacco, cigarettes were the popular form of tobacco use among both men and women in the Gambia (figure 2).

The prevalence of tobacco smoking increased with the increase of age among the Gambians (3.3% in 15–19 years to 16.7% in 40–49 years group). Non-Gambian (7%, 95% CI 5.1% to 9.2%) had lower smoking prevalence than other ethnic groups, while individuals with one child (12.1%) were the most prevalent class of parity. The prevalence of smoking was the lowest in the higher education category (5.7%) among all education groups. Smoking prevalence decreased among higher wealthy status. In occupation, not working groups had a smoking prevalence <2%, while the population involved in manual work had a smoking prevalence >20%. In access to information, smoking prevalence increased with the increased access to newspaper/magazines, television and radio (table 1).

Factors associated with smoking

Men (AOR 32.9; $p<0.001$) were more likely to smoke tobacco compared with women in the Gambia (table 2). Age was associated with smoking in this country. The strength of association increased with the increase of age (AOR 3.41 in 20–29, AOR 6.50 in 30–39 and AOR 9.08 in 40–49; reference group 15–19; $p<0.001$). Those who attained primary education level had a higher odds ratio (AOR 5.35, 95% CI 3.35 to 8.54) than participants with secondary education (AOR 3.26, 95% CI 2.17 to 4.9) and no education (AOR 2.73, 95% CI 1.68 to 4.44) had lower odds of self-reporting tobacco smoking compared with the individuals with higher education (≥ 12 schooling year).

The occupation was referenced to not working group, and all other occupations had a significant positive association with tobacco smoking in both univariable and multivariable regression. In wealth status, poorest (AOR 1.86, 95% CI 1.16 to 2.98, $p=0.01$) and poorer group

Table 1 Characteristics of participants and prevalence of tobacco smoking among the Gambians*

| Factor | Total | Smoking tobacco | | Prevalence, % (95% CI)‡ | P value |
|-----------------------------|---------------|-----------------|---------------|-------------------------|---------|
| | N (%)† | Yes (%)† | No (%)† | | |
| Participants | 16066 (100) | 869 (100) | 15 197 (100) | 9.9 (8.9 to 11.0) | |
| Age | | | | | <0.001 |
| 15–19 | 3766 (23.4) | 75 (8.6) | 3691 (24.3) | 3.3 (2.3 to 4.5) | |
| 20–29 | 5648 (35.2) | 269 (31.0) | 5379 (35.4) | 8.9 (7.6 to 10.3) | |
| 30–39 | 4136 (25.7) | 297 (34.2) | 3839 (25.3) | 13.6 (11.6 to 15.6) | |
| 40–49 | 2516 (15.7) | 228 (26.2) | 2288 (15.1) | 16.7 (14.2 to 19.4) | |
| Sex | | | | | <0.001 |
| Women | 11 865 (73.9) | 58 (6.7) | 11 807 (77.7) | 0.65 (0.4 to 0.8) | |
| Men | 4201 (27.1) | 811 (93.3) | 3390 (22.3) | 19.3 (17.4 to 21.3) | |
| Union | | | | | 0.421 |
| Never union | 5603 (34.9) | 357 (42.1) | 5246 (34.5) | 9.6 (8.3 to 11) | |
| Currently or formally union | 10463 (65.1) | 512 (58.9) | 9951 (65.5) | 10.2 (9 to 11.5) | |
| Religion | | | | | 0.437 |
| Islam | 15 671 (97.5) | 849 (97.7) | 14 822 (97.5) | 10 (9 to 11) | |
| Others | 395 (2.5) | 20 (2.3) | 375 (2.5) | 8 (4.3 to 13.4) | |
| Ethnic group | | | | | 0.014 |
| Non-Gambian | 1639 (10.2) | 70 (8.1) | 1569 (10.3) | 7 (5.1 to 9.2) | |
| Mandinka/Jahanka | 4932 (30.7) | 293 (33.7) | 4639 (30.5) | 11.4 (9.7 to 13.3) | |
| Wolof | 2294 (14.3) | 104 (12.0) | 2190 (14.4) | 8.5 (6.6 to 10.8) | |
| Fula/Tukulur/Lorobo | 3528 (22.0) | 194 (22.3) | 3334 (21.9) | 8.7 (7 to 10.7) | |
| Others | 3673 (22.9) | 208 (23.9) | 3465 (22.8) | 10.6 (8.7 to 12.7) | |
| Parity | | | | | 0.137 |
| No child | 6584 (41.0) | 391 (45.0) | 6193 (40.8) | 9.5 (8.2 to 10.8) | |
| One child | 1880 (11.7) | 106 (12.2) | 1774 (11.7) | 12.1 (9.7 to 14.8) | |
| One+children | 7602 (47.3) | 372 (42.8) | 7230 (47.6) | 9.9 (8.6 to 11.3) | |
| Place of residence | | | | | 0.0582 |
| Rural | 7060 (43.9) | 335 (38.6) | 6725 (44.3) | 8.6 (7.3 to 9.9) | |
| Urban | 9006 (56.1) | 534 (61.4) | 8472 (55.7) | 10.3 (9.1 to 11.7) | |
| Region | | | | | 0.066 |
| Mansakonko | 1361 (8.5) | 59 (6.8) | 1302 (8.6) | 8.4 (6.2 to 11) | |
| Banjul | 1414 (8.8) | 102 (11.7) | 1312 (8.6) | 12.1 (10.4 to 13.9) | |
| Kanifing | 2246 (14.0) | 156 (18.0) | 2090 (13.8) | 12.1 (10.2 to 14.2) | |
| Brikama | 3239 (20.2) | 177 (20.4) | 3062 (20.1) | 9.6 (7.8 to 11.5) | |
| Kerewan | 1857 (11.6) | 87 (10.0) | 1770 (11.6) | 8.3 (6.1 to 10.9) | |
| Kuntaur | 1693 (10.5) | 81 (9.3) | 1612 (10.6) | 8.9 (6.4 to 11.9) | |
| Janjanbureh | 1715 (10.7) | 91 (10.5) | 1624 (10.7) | 8.8 (7.3 to 10.5) | |
| Basse | 2541 (15.8) | 116 (13.3) | 2425 (16.0) | 9 (7 to 11.4) | |
| Education | | | | | <0.001 |
| No education | 6214 (38.7) | 241 (27.7) | 5973 (39.3) | 7.5 (6.2 to 8.9) | |
| Primary | 2720 (16.9) | 190 (21.9) | 2530 (16.6) | 14.2 (11.8 to 16.8) | |
| Secondary | 6162 (38.4) | 389 (44.8) | 5773 (38.0) | 10.7 (9.2 to 12.3) | |
| Higher | 970 (6.0) | 49 (5.6) | 921 (6.1) | 5.7 (4 to 7.9) | |
| Wealth status | | | | | 0.9198 |
| Poorest | 4402 (27.4) | 231 (26.6) | 4171 (27.4) | 10.3 (8.7 to 12.1) | |
| Poorer | 3116 (19.4) | 172 (19.8) | 2944 (19.4) | 10.6 (8.5 to 12.9) | |

Continued

Table 1 Continued

| Factor | Total | Smoking tobacco | | Prevalence, % (95% CI)‡ | P value |
|--|--------------|-----------------|--------------|-------------------------|---------|
| | N (%)† | Yes (%)† | No (%)† | | |
| Middle | 3104 (19.3) | 165 (19.0) | 2939 (19.3) | 9.6 (7.6 to 11.9) | |
| Richer | 2719 (16.9) | 133 (15.3) | 2586 (17.0) | 9.8 (7.8 to 12.2) | |
| Richest | 2725 (17.0) | 168 (19.3) | 2557 (16.8) | 9.5 (7.6 to 11.6) | |
| Occupation | | | | | <0.001 |
| Not working | 4869 (30.3) | 52 (6.0) | 4817 (31.7) | 1.9 (1.3 to 2.8) | |
| Professional/technical/managerial /clerical/sales/services/armed forces/other | 6454 (40.2) | 526 (60.5) | 5928 (39.0) | 12.9 (11.5 to 14.4) | |
| Agricultural-self employed | 3651 (22.7) | 114 (13.1) | 3537 (23.3) | 7.1 (5.2 to 9.4) | |
| Skilled/unskilled manual | 1092 (6.8) | 177 (20.4) | 915 (6.0) | 21 (17.3 to 25) | |
| Access to information | | | | | <0.001 |
| Reading newspaper/magazine | | | | | <0.001 |
| Not at all | 13853 (86.2) | 677 (77.9) | 13176 (86.7) | 9 (8 to 10) | |
| Less than once a week | 1586 (9.9) | 118 (13.6) | 1468 (9.7) | 13.5 (10.7 to 16.5) | |
| At least once a week | 627 (3.9) | 74 (8.5) | 553 (3.6) | 13.9 (9.6 to 18.9) | |
| Watching television | | | | | 0.0843 |
| Not at all | 3439 (21.4) | 142 (16.3) | 3297 (21.7) | 8.1 (6.3 to 10.2) | |
| Less than once a week | 4106 (25.6) | 211 (24.3) | 3895 (25.6) | 9.2 (7.6 to 11.1) | |
| At least once a week | 8521 (53.0) | 516 (59.4) | 8005 (52.7) | 10.6 (9.4 to 11.9) | |
| Listening radio | | | | | <0.001 |
| Not at all | 3507 (21.8) | 82 (9.4) | 3425 (22.5) | 4.9 (3.6 to 6.4) | |
| Less than once a week | 5186 (32.3) | 169 (19.4) | 5017 (33.0) | 5.9 (4.6 to 7.3) | |
| At least once a week | 7373 (45.9) | 618 (71.1) | 6755 (44.4) | 14 (12.5 to 15.7) | |

*Data are from Standard DHS conducted in the Gambia 2019–20. The age of respondents was 15–49 years old.
 †Column percentages. Data are not weighted in this column.
 ‡Data are weighted in this column.
 DHS, Demographic and Health Survey; N, number of respondents; Union, respondent live/lived together with men/women.

(AOR 1.48, 95% CI 1.02 to 2.14; $p=0.042$) had increased OR of reporting smoking compared with richest households. Mandinka/Jahanka ethnic group smoked 142% more likely tobacco ($p<0.001$), compared with the

non-Gambian category. Individuals who had one child had an increased odds ratio (AOR 1.88, 95% CI 1.27 to 2.77), where the reference group was the population with more than one child. In Gambia, individuals' union status

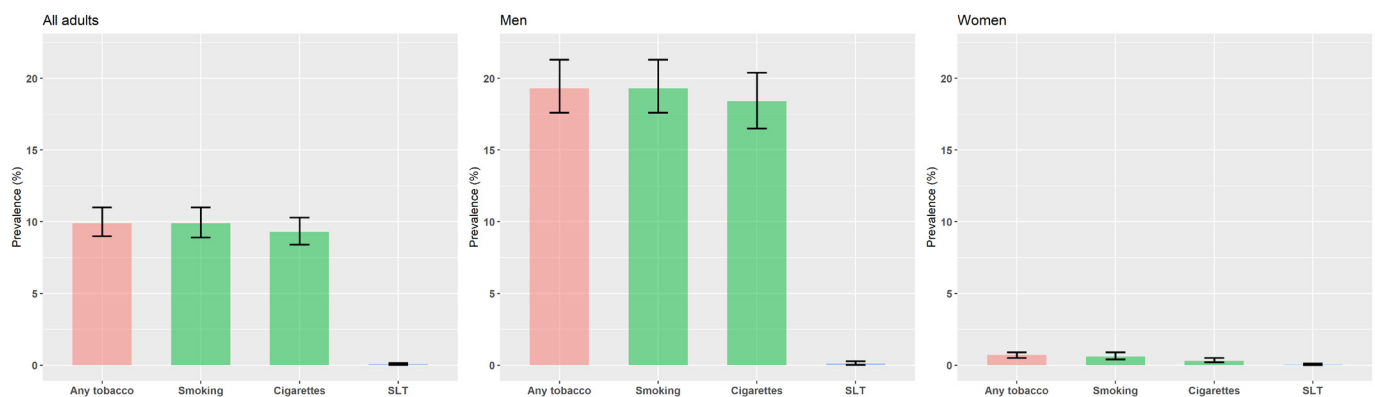


Figure 2 Prevalence of tobacco use in the Gambia in 2019–2020. Prevalence is shown in percentage with a 95% CI value. The black-coloured error bar shows 95% CI. The left bar graph shows the tobacco prevalence of all adults aged 15–49 years, the middle bar graph shows the tobacco prevalence of men and the right bar graph shows the tobacco prevalence of women. SLT, smokeless tobacco.

Table 2 Logistic regression to identify factors associated with tobacco smoking in the Gambia*

| Factors | Univariable regression | | Multivariable regression | |
|-----------------------------|------------------------|---------|--------------------------|---------|
| | Unadjusted OR (95% CI) | P value | Adjusted OR (95% CI) | P value |
| Age | | | | |
| 15–19 | 1 (ref) | | 1 (ref) | |
| 20–29 | 2.86 (1.99 to 4.11) | <0.001 | 3.41 (2.24 to 5.19) | <0.001 |
| 30–39 | 4.61 (3.11 to 6.84) | <0.001 | 6.5 (3.66 to 11.54) | <0.001 |
| 40–49 | 5.89 (3.98 to 8.71) | <0.001 | 9.08 (5.08 to 16.22) | <0.001 |
| Sex | | | | |
| Women | 1 (ref) | | 1 (ref) | |
| Men | 39.33 (27.08 to 57.13) | <0.001 | 32.9 (21.94 to 49.32) | <0.001 |
| Union | | | | |
| Currently or formally union | 1 (ref) | | 1 (ref) | |
| Never union | 0.93 (0.77 to 1.11) | 0.420 | 1.14 (0.78 to 1.68) | 0.497 |
| Religion | | | | |
| Islam | 1.27 (0.7 to 2.32) | 0.44 | 1.19 (0.58 to 2.44) | 0.645 |
| Others | 1 (ref) | | 1 (ref) | |
| Ethnic group | | | | |
| Non-Gambian | 1 (ref) | | 1 (ref) | |
| Mandinka/Jahanka | 1.73 (1.21 to 2.46) | 0.003 | 2.42 (1.58 to 3.72) | <0.001 |
| Wolof | 1.25 (0.84 to 1.85) | 0.269 | 1.46 (0.9 to 2.37) | 0.124 |
| Fula/Tukulur/Lorobo | 1.28 (0.86 to 1.88) | 0.223 | 1.47 (0.93 to 2.32) | 0.101 |
| Others | 1.59 (1.07 to 2.36) | 0.023 | 1.96 (1.22 to 3.13) | 0.006 |
| Parity | | | | |
| No child | 0.95 (0.79 to 1.16) | 0.64 | 1.29 (0.86 to 1.93) | 0.214 |
| One child | 1.25 (0.97 to 1.61) | 0.08 | 1.88 (1.27 to 2.77) | 0.001 |
| One+children | 1 (ref) | | 1 (ref) | |
| Place of residence | | | | |
| Rural | 1 (ref) | | 1 (ref) | |
| Urban | 1.23 (0.99 to 1.52) | 0.059 | 1.45 (0.98 to 2.13) | 0.067 |
| Region | | | | |
| Mansakonko | 1 (ref) | | 1 (ref) | |
| Banjul | 1.5 (1.07 to 2.11) | 0.020 | 1.39 (0.87 to 2.23) | 0.167 |
| Kanifing | 1.5 (1.06 to 2.13) | 0.025 | 1.48 (0.93 to 2.36) | 0.102 |
| Brikama | 1.15 (0.8 to 1.67) | 0.442 | 1.08 (0.69 to 1.71) | 0.729 |
| Kerewan | 0.99 (0.64 to 1.51) | 0.947 | 1.07 (0.66 to 1.73) | 0.788 |
| Kuntaur | 1.07 (0.69 to 1.65) | 0.766 | 1.22 (0.76 to 1.96) | 0.422 |
| Janjanbureh | 1.06 (0.74 to 1.51) | 0.758 | 1.19 (0.78 to 1.82) | 0.429 |
| Basse | 1.09 (0.73 to 1.62) | 0.679 | 1.09 (0.7 to 1.7) | 0.687 |
| Education | | | | |
| No education | 1.33 (0.89 to 1.99) | 0.17 | 2.73 (1.68 to 4.44) | <0.001 |
| Primary | 2.73 (1.85 to 4.03) | <0.001 | 5.35 (3.35 to 8.54) | <0.001 |
| Secondary | 1.98 (1.38 to 2.82) | <0.001 | 3.26 (2.17 to 4.9) | <0.001 |
| Higher | 1 (ref) | | 1 (ref) | |
| Wealth status | | | | |
| Poorest | 1.10 (0.82 to 1.47) | 0.53 | 1.86 (1.16 to 2.98) | 0.010 |
| Poorer | 1.13 (0.82 to 1.56) | 0.46 | 1.48 (1.02 to 2.14) | 0.042 |

Continued

Table 2 Continued

| Factors | Univariable regression | | Multivariable regression | |
|--|------------------------|---------|--------------------------|---------|
| | Unadjusted OR (95% CI) | P value | Adjusted OR (95% CI) | P value |
| Middle | 1.01 (0.72 to 1.42) | 0.95 | 0.98 (0.66 to 1.47) | 0.940 |
| Richer | 1.04 (0.75 to 1.44) | 0.81 | 1 (0.7 to 1.42) | 0.976 |
| Richest | 1 (ref) | | 1 (ref) | |
| Occupation | | | | |
| Not working | 1 (ref) | | 1 (ref) | |
| Professional/technical/managerial/clerical/sales/services/armed forces/other | 7.53 (4.99 to 11.38) | <0.001 | 2.11 (1.32 to 3.36) | 0.002 |
| Agricultural/self employed | 3.90 (2.38 to 6.39) | <0.001 | 2.01 (1.2 to 3.37) | 0.008 |
| Skilled/unskilled manual | 13.47 (8.62 to 21.06) | <0.001 | 2.73 (1.67 to 4.48) | <0.001 |
| Access to information | | | | |
| Reading newspaper/magazine | | | | |
| Not at all | 1 (ref) | | 1 (ref) | |
| Less than once a week | 1.57 (1.19 to 2.08) | 0.002 | 1.34 (0.98 to 1.84) | 0.071 |
| At least once a week | 1.63 (1.1 to 2.42) | 0.016 | 1.01 (0.67 to 1.52) | 0.958 |
| Watching television | | | | |
| Not at all | 1 (ref) | | 1 (ref) | |
| Less than once a week | 1.15 (0.86 to 1.53) | 0.337 | 0.85 (0.59 to 1.23) | 0.383 |
| At least once a week | 1.34 (1.02 to 1.76) | 0.036 | 0.86 (0.62 to 1.19) | 0.372 |
| Listening radio | | | | |
| Not at all | 1 (ref) | | 1 (ref) | |
| Less than once a week | 1.21 (0.83 to 1.77) | 0.32 | 0.97 (0.66 to 1.42) | 0.862 |
| At least once a week | 3.17 (2.34 to 4.29) | <0.001 | 1.28 (0.95 to 1.73) | 0.106 |

*Data are from Standard Demographic and Health Survey conducted in the Gambia 2019–2020. The age of respondents was 15–49 years old. Data are weighted in this column.
OR, Odds ratio; Ref, reference group; Union, respondent live/lived together with men/women.

with men or women, religion, place of residence, region and access to the information (newspaper/magazine, television, radio) had an insignificant association with tobacco smoking.

DISCUSSION

Despite two decades of efforts to control tobacco smoking in the Gambia,¹⁹ this country has a high prevalence of tobacco use among adults aged 15–49 years. Moreover, one in ten adults smoked tobacco in 2019–2020, while 81% of users smoked tobacco daily. The smoking prevalence in the Gambia was higher than the average prevalence of tobacco smoking in the Western sub-Saharan Africa region and lower than Guinea, Mauritania and Sierra Leone.⁷ Chisha *et al* also found most smokers in the Gambia were daily users.²⁰ The explanation can be other Western sub-Saharan African countries has evidence-based tobacco cessation strategies, other tobacco control policies, higher taxation and smoking cessation support more than the Gambia has. For example, Ghana has a national tobacco cessation strategy and clinical guidelines.²¹ Tobacco smoking among men was significantly higher than women in this country in

2019. Smoking prevalence was significantly higher among older people. A study on 30 sub-Saharan African countries also found a higher prevalence of smoking among men than women and among older people.²² We found people involved in manual work were the most prevalent group of smoking (21%) in the Gambia. Manual workers smoked more also found in Ethiopia.²³

Sex, age, education level, occupation and household wealth were significantly associated with tobacco smoking in the Gambia. We found that the prevalence of tobacco smoking is comparatively higher among men than women. Another multicountry study conducted sub-Saharan Africa found men smoked higher than women.²⁴ This might be the result of the unacceptability of smoking practices towards women in this country. Older people smoked tobacco more likely than younger people. This finding is in line with previous tobacco studies conducted in sub-Saharan Africa.^{18 22 25 26} We can explain this by the age effects of tobacco smoking. Individuals progressively initiate tobacco smoking as they grow older, and the rate of smoking cessation is lower than the smoking initiation rate.



People with a lower level of education smoked tobacco more than people with higher education in The Gambia. This finding aligns with previous studies performed in sub-Saharan Africa and Asia.^{17 22} The protective effect of households' wealth was coherent with the finding in other sub-Saharan African countries.^{16 18} People who have lower education were less aware of their health risks.²⁷ The tobacco epidemic initiates among higher socioeconomic groups in developed countries and then extends to poorer and less educated individuals,²⁸ while in low-income and middle-income countries, the less educated may take up smoking owing to a lack of information and awareness about the harmful consequences of smoking.²⁷ In addition to this, poor people have less control to deal with the management of stress from their economic situations.²⁹

People involved in any work had a positive association with tobacco smoking compared with those not working. Manual workers had the strongest association with smoking in the Gambia. A similar finding was observed in sub-Saharan African studies^{22 26} and the USA.³⁰ Working individuals may experience work stress. At the same time, manual work represents the social status, education and income of people, all of which have an impact on healthy habits and seeking medical help.³¹

Public health implications

The Gambia implemented diverse tobacco control initiatives and ratified the WHO Framework Convention on Tobacco Control^{19 21}; however, only 3% of smoking prevalence was reduced among men since 2013.^{14 32} The reduction rate of smoking prevalence can be accelerated by increasing smoking cessation and reducing the initiation rate of smoking through the proper support in this country. First, the government should develop a national tobacco cessation strategy.²¹ Advertising and promotion of tobacco are banned. However, we found that access to media did not act as a protective factor against smoking. We also found poor, manual workers and lower educated people smoked more likely in the Gambia. Awareness about the dangers of tobacco smoking can help to reduce early initiation of smoking and increase smoking cessation. Antitobacco campaigns should include television, radio and newspapers to spread anti-smoking messages. Price incentive initiatives can be effective in this country. Currently, the excise tax rate of tobacco is 33% in the Gambia; however, WHO has recommended 70% of taxation of retail tobacco price.³³ It is documented that increasing taxes reduced tobacco smoking in this country.³⁴ Increment revenue from tax can be allocated to implement smoking cessation support from primary care to tertiary hospitals and the community, and initiate free nicotine replacement therapy and quitline, which are still absent in the Gambia.²¹

Strengths and limitations

The major strength of this study is that it analysed data from the nationally representative survey, which included

both men and women aged between 15 and 49 years with a high response rate. It provided enough power to investigate the prevalence of and factors linked to tobacco smoking. Therefore, the findings are generalisable among the population aged 15–49 years old and in similar settings. In all analyses in this study, sample weight, cluster effect and complex sampling design were employed and generated with 95% CI with point estimates. It improves the precision of the results in this study. However, this study had a few limitations. A major limitation is that we drew the data from a cross-sectional study. The smoking habit of respondents could not be followed over a period due to the study design. Causal inferences could not be drawn. Another drawback is that the sample included men and women aged 15–49 years, which does not reflect the whole population of the Gambia. The findings might be underestimated as we found tobacco smoking increases with age; we can hypothesise that people aged >49 years would smoke more in this country who were not included in this study. Furthermore, this questionnaire-based and self-reporting data were gathered based on events; there is a risk of recall bias and bias owing to social stigma and norms. The findings may have selection bias as some participants did not respond or missed the complete interview.

CONCLUSIONS

The key findings from this paper are the prevalence of tobacco smoking and its determinants in the Gambia. Men, elderly people, manual workers, those with lesser education and people with lower wealth status were the most vulnerable to tobacco smoking. In addition to monitoring current tobacco use, policies and tailoring interventions, the government should launch a public awareness campaigns using different state-of-art platforms along with regular strategies focusing on the adverse effect of smoking and appropriate cessation support services focusing on those risk groups irrespective of their health status.

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Ethics approval We analysed the publicly available DHS dataset with the approval of the DHS programme. The DHS survey followed standardised data collection procedures. They received permission from the relevant authority's ethical review committees while conducting the primary study. According to the DHS, informed consent was taken from respondents/households who enrolled in the survey.

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