PDF version

Muna Nur,[1] Naiema A. Wagialla,[2] Mai Eltigany,[3] Manal Elemam,[4] Nazik Ibrahim,[4] Nahid Ali,[4] Fatima Hassan,[4] Nazik Hassan[4] and Nazik Nurelhuda[5]

[1]Directorate General of Planning and Health Development Policy Department, Federal Ministry of Health, Khartoum, Sudan. [2]Faculty of Medicine, Almughtaribeen University, Khartoum, Sudan. [3]World Health Organization Sudan Country Office, Khartoum, Sudan. [4]Disease Control Directorate, Federal Ministry of Health, Khartoum, Sudan. [5]Dental Public Health Unit, Faculty of Dentistry, University of Khartoum, Khartoum, Sudan (Correspondence to: n.nurelhuda@gmail.com).

Abstract

Background: Tobacco is a leading cause of death and illness despite > 50 years of antitobacco efforts.

Aims: To establish the determinants of current and former smoking and smokeless tobacco use in Sudan as measured by the STEPwise Survey 2016.

Methods: A household-based cross-sectional World Health Organization STEPwise Survey was conducted among 7745 Sudanese citizens aged 18–69 years across 11 states in Sudan. A 4-stage stratified cluster sampling design was implemented. The generic STEPS Instrument (version 3.2) was used and questions were tailored to the Sudanese context.

Results: Among current male smokers, 63.7% were aged ≤ 35 years, 50.7% were illiterate or

did not complete primary school, 84.5% were employed and 52.4% were in the lowest 2 quintiles of income. Among male smokeless tobacco users, 54.8% were aged ≤ 35 years, 48.4% were illiterate or did not complete primary school, 89.7% were employed and 52.2% were in the lowest 2 quintiles of income. Using multivariate logistic regression models, current smoking in men was associated with older age, informal education, unemployment and lower income. Smokeless tobacco use was associated with age 18–25 years, informal education, unemployment and lower income.

Conclusions: Both forms of tobacco use were associated with poor socioeconomic status and unemployment. Smokeless tobacco use was associated with age 18–25 years as opposed to smoking tobacco use. These results can inform the target audience of the future tobacco control plans.

Keywords: tobacco, Sudan, STEPwise, survey smoking.

Citation: Nur M; Wagialla N; Eltigany M; Elemam M; Ibrahim N; Ali N; et al. Determinants of tobacco use in Sudan: secondary analysis of STEPwise Survey 2016. East Mediterr Health J. 2021;27(2):116-123 https://doi.org/10.26719/emhj.20.104

Received: 26/06/19; accepted: 02/04/20

Copyright © World Health Organization (WHO) 2021. Open Access. Some rights reserved. This work is available under the CC BY-NC-SA 3.0 IGO license (https://creativecommons.org/licenses/by-nc-sa/3.0/igo)

Introduction

The tobacco epidemic is one of the biggest global public health threats (1) and remains a leading cause of death, illness and impoverishment despite > 50 years of antitobacco efforts (2,3). The World Health Organization (WHO) reported in 2018 that there were 1.1 billion smokers worldwide; most of whom live in low- and middle-income countries (1). In 2015, smoking prevalence worldwide was estimated to be 25.0% in men and 5.4% in women (4). Current tobacco smoking varies among countries in the Eastern Mediterranean Region from

11.0% in the Islamic Republic of Iran to 24.9% in Tunisia (5). In 2015, 11.5% of global deaths were attributable to smoking (6.4 million people) (4). In the Eastern Mediterranean Region, noncommunicable diseases (NCDs) are responsible for > 1.7 million deaths every year; two thirds of which are linked to unhealthy behaviour, or risk factors, including tobacco use (6).

In Sudan, NCDs are emerging, doubling the existing burden of communicable diseases and causing 52% of all deaths in the country in 2016 (7). The prevalence of smoking and smokeless tobacco users in Sudan was 15.6% in 2016 as reported by the National STEPwise Survey. The overall prevalence of smoking prevalence was 9.6%, 17.1% of men and 0.7% of women, similar to Kenyan (10.1%) and Ugandan (9.6%) estimates (8,9), but lower than some countries in the Eastern Mediterranean Region, such as Egypt (22.7%) and Kuwait (20.5%) (10,11). Prevalence of smokeless tobacco users was 7.9%, 17.3% in men and 0.2% in women (12). This prevalence is higher than in most neighbouring countries: 0.2% in Egypt, 0.9% in Iraq and around 4% in Uganda and Kenya (8–10,13). Also, the habit is almost exclusive to men in Egypt and Iraq (10,13). In Kenya, tobacco use was evenly distributed across both sexes (8), while in Uganda, women aged 50–69 years had a higher prevalence (9).

In Sudan, smokeless tobacco is locally known as toombak, which is a highly addictive substance. Its preparation is cheap and poorly regulated. Oral cancer which is ranked sixth amongst all cancer types in Sudan is strongly associated with this habit (14).

A broad range of social, environmental, psychological and genetic factors are associated with tobacco use. Inequities in these factors lead to discrepancies in tobacco use and impediment of its cessation and control (15). By understanding these determinants in the Sudanese population, we may be able to meet the needs of different social groups; particularly the most disadvantaged. The aim of this study was to establish the determinants of current and former smoking and smokeless tobacco use in Sudan as measured by Sudan's STEPwise Survey of 2016.

Methods

Study population

This was a WHO STEPwise household-based cross-sectional survey (16). It was conducted among Sudanese citizens aged 18–69 years across 11 states in Sudan from February to December 2016. A 4-stage stratified cluster sampling design was used. Administratively, Sudan is divided into 18 states and 6 regions: North, East, Khartoum, Central, Kordofan and Darfur. States were randomly selected from each region. No geographical areas or populations were excluded from the sampling frame. Thus, 11 states were selected according to probability proportional to the size (PPS), to represent the 6 regions. The Popular Administrative Unit

(PAU) is the smallest geographical unit, defined as the cluster in the region. Clusters were randomly sampled from a list of PAUs, from both urban and rural strata, according to PPS. All households in the selected PAU were selected randomly from each cluster. All the household members fulfilling inclusion criteria were listed and 1 member was selected randomly.

The target population size used was a projected estimate for 2016 based on the household census of 2008. The calculated sample size was 8154 based on precision of 95%, a nonresponse rate estimate of 10% and design effect of 1.5. This sample had the power to produce results representative for Sudan and to the 6 geographical regions.

Data collection

Data were obtained from the first of the 3 steps of the WHO STEPwise Survey and collected using digital handheld devices (16). Interviews were administered by trained interviewers. The generic STEPS Instrument (version 3.2) questions were adapted to the Sudanese context. Variables used were the following sociodemographic variables: age (18–25,26–35,36–45,46–55 and 56–69 years); sex; educational level [illiterate, Quranic schools (informal Islamic and Arabic language education); did not complete primary school, completed primary school, completed secondary school, and completed university studies and above]; employment status; ever used alcohol; income quintiles (poorest, second, middle, fourth and richest); and marital status (not married, married and formerly married). The main instrument outcomes used were current and former use of smoking and smokeless tobacco. Smoking tobacco included cigarettes, cigars, pipes and hookah. Smokeless tobacco referred to the use of what is locally known as toombak (14). Current tobacco users, smoking and smokeless, were those who were currently smoking or using tobacco on a daily basis and/or occasionally.

Data analysis

Data were analysed using IBM SPSS version 20. Frequencies, $\chi 2$ and multivariate logistic regression models were used.

Results

Sociodemographics of tobacco users

We included 7745 respondents (95% response rate) in the analysis. Reported results were weighted by geographic region and rural–urban residence status. Among current Sudanese male smokers, 63.7% were aged ≤ 35 years, 50.7% were illiterate or did not complete primary school, 84.5% were employed, 22.6% consumed alcohol, 52.4% were in the lowest 2 quintiles of income and 61% were married (Table 1). Among male former smokers, 42.5% were aged ≤ 35 years, 43.5% were illiterate or did not complete primary school, 86.5% were employed, 23.7% consumed alcohol, 43.5% were in the lowest 2 quintiles of income and 67.5% were

married. Among current Sudanese male smokeless tobacco users, 54.8% were aged ≤ 35 years, 48.4% were illiterate or did not complete primary school, 89.7% were employed, 22.0% consumed alcohol, 52.2% were in the lowest 2 quintiles of income and 68.2% were married. Among those who were former smokeless tobacco users, 37.5% were aged ≤ 35 years, 45.5% were illiterate or did not complete primary school, 84.9% were employed, 39.8% consumed alcohol, 40.3% were in the lowest 2 quintiles of income and 71.4% were married.

Among Sudanese current female smokers, 54.9% were aged ≤ 35 years, 38.7% were illiterate or did not complete primary school, 55.9% were employed, 10.0 % consumed alcohol, 54.6% were within the lowest 2 income quintiles and 71.8% were married (Table 2). Among former smokers, 38.1% were aged ≤ 35 years, 74.7% were illiterate or did not complete primary school, 23% were employed, 40.2% consumed alcohol, 59.2% were from the second income band and 54.8% were married. Among current Sudanese female smokeless tobacco users, 27.7% were aged ≤ 35 years, 54.4 % were illiterate or did not complete primary school, 33.2% were employed, 61.2% consumed alcohol, 26.7% were within the second income quintile and 93.6% were married. Among the former female smokeless tobacco users, 41.7% were aged ≤ 35 years, 21.6% were illiterate, 43.2% were employed, 39.8% consumed alcohol, 38.5% were from the lowest 2 income quintiles and 80.1% were married.

Determinants of tobacco use among Sudanese men

Using multivariate logistic regression models to adjust for confounders, tobacco use was associated with all of the measured variables as follows.

Current smoking in men was associated with older age, informal education, unemployment, not ever using alcohol, lower income and marital status of single (Table 3).

Older men (aged 26–35,36–45,46–55 and ≥ 56 years) were more likely to be smokers when compared to men aged 18–25 years. Men who completed university/postgraduate studies were less likely to be smokers than those who were illiterate. Unemployed men were more likely to be smokers. Those who consumed alcohol were less likely to be current smokers than those who never consumed alcohol. Men with the lowest income tended to be smokers when compared to their richest counterparts. Married men were less likely to be smokers than unmarried men.

Former smoking in men was associated with the same factors as in current smokers. Older men (aged 36–45,46–55 and ≥ 56 years) were less likely to be former smokers than younger men were (Table 3). Those who had any formal schooling were less likely to be former smokers than

illiterate men were. Unemployed men were twice more likely to be former smokers. Men who ever consumed alcohol were less likely to have been former smokers. Men from the lowest income band were

8 times more likely to be former smokers. Those who were married were more likely to be former smokers than unmarried men were.

Current smokeless tobacco use was associated with age 18–25 years, low education, unemployment, never consuming alcohol and low income (Table 3). Older men were less likely to be current smokeless tobacco users than younger men were, which differed from current smokers. Informal education was highly associated with smokeless tobacco use. Unemployed men were more likely to be smokeless tobacco users than employed men were. Those who had ever consumed alcohol were less likely to be smokeless tobacco users than those who had not. Men in the lowest income band were twice more likely to be smokeless tobacco users than those in the highest income band. Married men were more likely to be users of smokeless tobacco than unmarried men were.

Former smokeless tobacco use was associated with age 18–35 years, respondents who were illiterate and those with informal education, unemployment, not consuming alcohol, and low income (Table 3). Older men were less likely to be former smokeless tobacco users than the youngest age group were. Respondents with informal education were more likely to be former tobacco users than illiterate respondents were. Those who received formal education were all less likely to be former smokeless tobacco users than illiterate individuals were. Unemployed men were more likely to be former smokeless tobacco users than employed men were. Those who had ever consumed alcohol were less likely to be users than those who had never consumed alcohol. Those in the lowest income quintile were 5 times more likely to have been former tobacco users than those in the richest quintile. Married men were less likely to be former smokers than unmarried men were.

Since tobacco use was uncommon among female respondents, no significant associations were found.

Discussion

This nationwide survey found that poor socioeconomic status and young age were associated with tobacco use in Sudanese men. Current and former smoked and smokeless tobacco users tended to have low education, were unemployed and had low income. Former male smokers

were more likely to have been middle-aged, while current smokers were elderly. Most reported Sudanese smokers were men. This is similar to reports from countries in the Eastern Mediterranean Region (Bahrain, Islamic Republic of Iran, Egypt, Jordan, Iraq and Kuwait), African Region (Uganda, Kenya and Ethiopia), and Asian region (Pakistan and Nepal) (8–10,11,13,17–19,21,22). Low reports of female smokers could have been aggravated by interviewer bias subsequent to gender-based social stigma (17).

More than 60% of male smokers were aged ≤ 35 years with the highest proportion (36%) in 18–25-year age group. Similar findings have been found in other countries. The highest proportion in Bahrain was aged 20–39 years (17) and in Kuwait, 29.8% were aged 20–24 years and 27.1% 25–34 years (11). In contrast, in Iraq the highest proportion was aged 35–44 years (13), in Nepal 36–49 years (22) and other upper-middle-income countries like Argentina, Malaysia and Romania, the proportion was higher in middle-aged men (25–44 years) (23). Countries like the Islamic Republic of Iran, Kenya and Ethiopia showed higher estimates in older age groups (8,18,20). Furthermore, the older population (≥ 56 years) demonstrated a higher risk of association with current tobacco smoking. The longer experience and established networks of tobacco use in this age group could have discouraged them from quitting (20). Younger men were more likely to have been former smokers, supporting the finding that older men may find it more difficult to quit. Evidence has shown that health benefits are greater for people who quit at younger ages (24). In contrast, smokeless tobacco use had a higher association with younger men, possibly because it was cheaper and more readily available compared to cigarettes.

Smokers tended to have a low educational background in Sudan. Many studies in countries like Kenya and Pakistan have found that most tobacco users had only attended primary school (8,21,23). Furthermore, studies in Kenya, Pakistan, Nepal and India have shown that smokeless tobacco use was strongly associated with people with limited education, as in the present study (8,21,22,25). Low education could be a proxy for low awareness and consumer information on tobacco products, thus preventing individuals from taking informed decisions to avoid tobacco use (8,23). It was also found that participants with the lowest income were highly associated with tobacco use. Low income is commonly associated with undesired habits at national levels and within countries. A study in 48 low- and middle-income countries demonstrated the prevalence of smoking in men with lower incomes to be higher in most countries (26,27). Associations of tobacco use with poverty could lead to greater health inequalities between rich and poor people (20,23,25).

The economic recession in Sudan led to a rise in unemployment, a social determinant of health, thereby likely increasing the likelihood of smoking (28). People exposed to social and economic stressors like financial strain, stigma and loss of social role could perceive smoking as a coping mechanism (29). However, provision of employment opportunities may not solely prevent tobacco use. This was experienced in Nepal, where manual jobs increased the risk of using

tobacco when compared to professional or office-based jobs (22). Therefore, in addition to improving job prospects, promotion of work ethics demanded by professional workers to reduce tobacco use, like in Ethiopia, is essential, and should be extended to all sectors (20).

The present study found that men who reportedly never consumed alcohol were more likely to use tobacco. A study among Sudanese university students showed that alcohol was the third most commonly used substance after tobacco and cannabis (30). Alcohol, prohibited by law in Sudan, could have introduced an interviewer bias. Participants may have avoided reporting consumption because of religious restrictions, thus leading us to doubt the association.

Our findings are representative of the whole country because of the high response rate and the detailed sampling frame that took into account all the levels of the administrative organizational structure. Interestingly, 65% of the studied sample were women. This skewness can be explained by the internal migration of men to cities and out-migration to other countries, in search of better economic opportunities. This, in addition to the work of men as farmers and pastoralists resulted in the absence of eligible men in the households. The multivariate logistic regression models captured between 8.3% and 33% of the variables associated with tobacco use. This limited explanation of variance suggests the need for further research to explore variables that were not considered in this study. Nevertheless, our findings can be used to inform tobacco control policies in Sudan.

Sudan ratified the WHO Framework Convention on Tobacco Control in 2005 (31), but since then efforts have not been sufficient to put the country on track for achieving the global targets for tobacco control. Tobacco control is challenged by several factors including the strong influence of the tobacco industry as it continues to prevent, weaken and delay effective implementation of the Convention. Today, Sudan intends to focus on 3 areas: graphic tobacco warnings, review of tobacco law, and tobacco taxation. Future strategies can be informed by the present findings. Adjusting the interventions to target the reported vulnerable age groups will be cost-effective and impactful. Taxation could prove to be beneficial in Sudan (32), since higher taxes are especially effective for poor people and can even prevent young people from starting to smoke (5). Strong concerted efforts from the Ministries of Health and Social Welfare in Sudan and from civil society organizations can focus on availing employment and educational opportunities.

Conclusion

Low socioeconomic status and young age were associated with tobacco use in Sudanese men. Current and former smoked and smokeless tobacco users tended to have low education, were unemployed and had low income. Former male smokers were more likely to have been

middle-aged, while current smokers were elderly. Smokeless tobacco use was common among those aged 18–25 years. These results can inform the target audience of the future tobacco control plans.

Funding: None

Competing interests: None declared.

Déterminants de la consommation de tabac au Soudan : analyse secondaire de l’enquête STEPwise 2016

Résumé

Contexte : Le tabac est une des principales causes de mortalité et de morbidité malgré les efforts déployés depuis plus de 50 ans en matière de lutte antitabac.

Objectifs : Établir les déterminants du tabagisme et de la consommation de tabac sans fumée au moment de l’étude et dans le passé au Soudan, tels que mesurés par l'enquête STEPwise 2016.

Méthodes : Une enquête transversale STEPwise menée au sein des ménages par l’Organisation mondiale de la Santé (OMS) a été réalisée auprès de 7745 citoyens soudanais âgés de 18 à 69 ans dans 11 États du Soudan. Un sondage par grappe stratifié à quatre degrés a été mis en œuvre. L’instrument générique STEPS (version 3.2) a été utilisé et les questions ont été adaptées au contexte soudanais.

Résultats : Parmi les fumeurs masculins au moment de l’étude, 63,7 % avaient un âge inférieur ou égal à 35 ans, 50,7 % étaient analphabètes ou n’avaient pas terminé leurs études primaires, 84,5 % avaient un emploi et 52,4 % se situaient dans les deux quintiles de revenu les plus bas. Parmi les consommateurs de tabac sans fumée, 54,8 % avaient un âge inférieur ou égal à 35 ans, 48,4 % étaient analphabètes ou n'avaient pas terminé leurs études primaires, 89,7 % étaient en emploi et 52,2 % se situaient dans les deux quintiles de revenu les plus bas. À l'aide de modèles de régression logistique multivariée, le tabagisme au moment de l’étude chez les hommes était associé à un âge plus avancé, à une éducation informelle, au chômage et à des revenus plus faibles. Le tabagisme sans fumée est associé à la tranche d’âge 18-25 ans, à

l’éducation informelle, au chômage et à une baisse des revenus.

Conclusions : Ces deux formes de consommation de tabac sont associées à un statut socio-économique précaire et au chômage. Par opposition à la consommation de tabac fumé, le tabagisme sans fumée est associé à la tranche d’âge des 18-25 ans. Ces résultats pourront éclairer le public cible des futurs plans de lutte antitabac.

2016

WHO EMRO | Determinants of tobacco use in Sudan: secondary analysis of STEPwise Survey 2016

وانخفاض الدخل .

: ارتبط كلا هذين الشكلين من أشكال تعاطي التبغ بتدهور الوضع الاجتماعيالاستنتاجات
والاقتصادي والبطالة . وتبين وجود ارتباط بين تعاطي التبغ عديم الدخان وبين تراوُح
السن بين 18 و 25 عاماً، على عكس تعاطي التبغ المُدخَّن . ويمكن لتلك النتائج أن توجه
الجمهور المستهدف للخطط المستقبلية الموضوعة لمكافحة التبغ .

References

1. Tobacco key facts. Geneva: World Health Organization; 2018 (http://www.who.int/news-room/factsheets/detail/tobacco, accessed 15 March 2019).

2. Holford TR, Meza R, Warner KE, Meernik C, Jeon J, Moolgavkar SH et al. Tobacco control and the reduction in smoking-related premature deaths in the United States, 1964-2012. JAMA. 2014 Jan 8;311(2):164–71. http://dx.doi.org/10.1001/jama.2013.285112 PMID:24399555

3. US Department of Health and Human Services; Office of the Surgeon General (US); Office on Smoking and Health (US). The health consequences of smoking: a report of the Surgeon General. Atlanta: Centers for Disease Control and Prevention; 2004 (https://www.ncbi.nlm.nih.gov/books/NBK44695, accessed 30 July 2020).

4. GBD 2015 Tobacco Collaborators. Smoking prevalence and attributable disease burden in 195 countries and territories, 1990–2015: a systematic analysis from the global burden of disease study 2015. Lancet. 2017 May 13;389(10082):1885–906. https://doi.org/10.1016/S0140-6736(17)30819-X

5. WHO report on the global tobacco epidemic, 2017: monitoring tobacco use and prevention policies. Geneva: World Health Organization; 2017 (https://www.who.int/tobacco/global_report/2017/en/, accessed 30 July 2020).

11 / 15

6. Noncommunicable diseases: tobacco use. Cairo: World Health Organization Eastern Mediterranean Region; 2020 (http://www.emro.who.int/noncommunicable-diseases/causes/tobacco-use.html, accessed 30 July 2020).

7. Global health estimates 2016: deaths by cause, age, sex, by country and by region, 2000–2016. Geneva: World Health Organization; 2018 (https://www.who.int/healthinfo/global_burden_disease/en/, accessed 30 July 2020).

8. Ngaruiya C, AbuBakr H, Kiptui D, Kendagor A, Ntakuka M, Nyakundi P, et al. Tobacco use and its determinants in the 2015 Kenya WHO STEPS survey. BMC Public Health. 2018;18(3):Article number 1223. https://doi.org/10.1186/s12889-018-6058-59.

9. Uganda Ministry of Health. Non-communicable disease risk factor baseline survey. Uganda 2014 report (https://www.who.int/ncds/surveillance/steps/Uganda_2014_STEPS_Report.pdf, accessed 30 July 2020).

10. Egypt STEPS survey 2017 tobacco fact sheet [website] (https://www.who.int/ncds/surveillance/steps/Egypt_STEPS_Survey_2017_Tobacco_Fact_Sheet.pdf?ua=1, accessed 30 July 2020).

11. Noncommunicable diseases stepwise report 2006–2008. Gulf Cooperation Council; Kuwait Ministry of Health; World Health Organization (https://www.who.int/ncds/surveillance/steps/STEPS_Report_Kuwait.pdf, accessed 30 July 2020).

12. Sudan STEPS survey 2016 tobacco fact sheet [website] (https://www.who.int/ncds/surveillance/steps/Sudan-STEPS-2016-Tobacco-Fact-Sheet.pdf?ua=1, accessed 30 July 2020).

13. Chronic non-communicable diseases risk factors survey in Iraq 2006. A STEPwise approach. Iraq Ministry of Health; Iraq Ministry of Planning and Development Cooperation;

World Health Organization
(https://www.who.int/ncds/surveillance/steps/IraqSTEPSReport2006.pdf, accessed 30 July 2020).

14. Idris AM, Prokopczyk B, Hoffmann D. Toombak: a major risk factor for cancer of the oral cavity in Sudan. Prev Med 1994 Nov;23(6):832–9. https://doi.org/10.1006/pmed.1994.1141 PMID:7855117

15. Mentis AA. Social determinants of tobacco use: towards an equity lens approach. Tob Prev Cessation. 2017 Mar 2;3:7. http://dx.doi.org/10.18332/tpc/68836 PMID:32432182

16. STEPwise approach to non-communicable disease risk factor surveillance (STEPS). WHO STEPS Instrument (Core and Expanded). Geneva: World Health Organization (https://www.who.int/ncds/surveillance/steps/STEPS_Instrument_v2.1.pdf, accessed 30 July 2020).

17. Alsayyad J, Omran A (editors). National non-communicable disease risk factor survey 2007. Bahrain Ministry of Health
(https://www.who.int/ncds/surveillance/steps/2007_STEPS_Survey_Bahrain.pdf, accessed 30 July 2020).

18. Non-Communicable Diseases Research Center, Endocrinology and Metabolism Research Institute of Tehran University of Medical Sciences. Atlas of non-communicable disease risk factor surveillance in the Islamic Republic of Iran, STEPs 2016
(https://www.who.int/ncds/surveillance/steps/STEPS_2016_Atlas_EN.pdf?ua=1, accessed 30 July 2020).

19. Jordan STEPS survey 2007 fact sheet [website]
(https://www.who.int/ncds/surveillance/steps/2007_Fact_sheet_Jordan.pdf, accessed 30 July 2020).

20. Lakew Y and Haile D. Tobacco use and associated factors among adults in Ethiopia: further

analysis of the 2011 Ethiopian Demographic and Health Survey. BMC Public Health. 2015 May 13;15:487 http://dx.doi.org/10.1186/s12889-015-1820-4 PMID:25966998

21. Alam AY, Iqbal A, Mohamud KB, Laporte RE, Ahmed A, Nishtar S. Investigating socio-economic-demographic determinants of tobacco use in Rawalpindi, Pakistan. BMC Public Health. 2008 Feb 7;8:50 http://dx.doi.org/10.1186/1471-2458-8-50 PMID:18254981

22. Khanal V, Adhikari M, Karki S. Social determinants of tobacco consumption among Nepalese men: findings from Nepal Demographic and Health Survey 2011. Harm Reduct J. 2013 Dec 20;10:40 http://dx.doi.org/10.1186/1477-7517-10-40 PMID:24359118

23. Tee GH, Aris T, Rarick J, Irimie S. Social determinants of health and tobacco use in five low and middle-income countries – results from the Global Adult Tobacco Survey (GATS), 2011–2012. Asian Pac J of Cancer Prev. 2016;17(3):1269–76. http://dx.doi.org/10.7314/apjcp.2016.17.3.1269 PMID:27039759

24. The health benefits of smoking cessation: a report of the Surgeon General. Atlanta: US Department of Health and Human Services; Centers for Disease Control and Prevention; Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 1990.

25. Thakur JS, Prinja S, Bhatnagar N, Rana SK, Sinha DN, Singh PK. Widespread inequalities in smoking & smokeless tobacco consumption across wealth quintiles in States of India: need for targeted interventions. Indian J Med Res. 2015 Jun;141(6):789–98. http://dx.doi.org/10.4103/0971-5916.160704 PMID:26205022

26. Hosseinpoor AR, Parker LA, Tursan d'Espaignet E, Chatterji S. Socioeconomic inequality in smoking in low-income and middle-income countries: results from the World Health Survey. PLoS One. 2012;7(8):e42843. http://dx.doi.org/10.1371/journal.pone.0042843 PMID:22952617

27. Emamian MH, Fateh M, Fotouhi A. Socioeconomic inequality in smoking and its determinants in the Islamic Republic of Iran. East Mediterr Health J. 2020;26(1):29–38. http://dx.doi.org/10.26719/2020.26.1.29

28. Wang Q, Shen JJ, Cochran CC. Unemployment rate, Smoking in China: Are they related? Int J Environ Res Public Health. 2016 Jan 8;13(1):113. http://dx.doi.org/10.3390/ijerph13010113 PMID:26761019

29. De Vogli R, Santinello M Unemployment and smoking: does psychosocial stress matter? Tob Control. 2005 Dec;14:389–95. http://dx.doi.og/10.1136/tc.2004.010611 PMID:16319362

30. Osman T, Victor C, Abdulmoneim A, Mohammed H, Abdalla F, Ahmed A, Ali E, Mohammed W. Epidemiology of substance use among university students in Sudan. J Addict. 2016;2016:Article ID 2476164. https://doi.org/10.1155/2016/2476164.

31. WHO report on global tobacco epidemic, 2019. Country profile, Sudan [website] (https://www.who.int/tobacco/surveillance/policy/country_profile/sdn.pdf, accessed 30 July 2020).

32. Tabuchi T, Iso H, Brunner E. Tobacco control measures to reduce socioeconomic inequality in smoking: the necessity, time-course perspective, and future implications. J Epidemiol. 2018 Apr 5;28(4):170–5. http://dx.doi.org/10.2188/jea.JE20160206 PMID:29151476

Thursday 11th of July 2024 10:18:18 AM