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Sociodemographic predictors of smoking behaviour uptake and persistence among adults in South Africa

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Abstract

In tackling smoking prevalence, beyond understanding why people smoke generally, there is also a need to understand why individuals take up a smoking behaviour from non-smoking one and why some other retain a smoking behaviour. This study investigates sociodemographic predictors influencing the initiation and continuation of smoking behaviours among South African adults. Consequently, this study utilizes data from the fifth wave of the National Income Dynamics Study Survey, descriptive statistics, and bivariate probit regression estimation techniques. The findings indicate that being a male, employed, healthy, and residing in urban areas increases the likelihood of initiating smoking behaviour for previously nonsmoker by 0.78, 0.17, 0.8, 0.12 respectively. Likewise, the probability of persisting smoking behaviour is positively influenced by being employed (0.17), good health perception (0.83), and residing in urban area (0.089). On the other hand, being married, covered by medical insurance and level of education reduce the probability of initiating smoking behaviour as previously non-smoker and persistence smoking as previous smoker, respectively. This imply that that smoking behaviour uptake and persistency are significantly influenced by same variables. Based on these findings, the study suggests targeted interventions for adolescents and young adults, promotion of healthy marital relationships, job-specific interventions, educational campaigns, reassessment of health perceptions regarding smoking, and urban health initiatives. Specifically, given age-related patterns, smoking control efforts should focus on adolescents and young adults, tailored interventions for specific occupational sectors and public health campaigns promoting education and correcting misconceptions are recommended, with a focus on urban areas where smoking initiation and persistence are more prevalent.

Keywords: Smoking Transition; Noncommunicable Diseases; Bivariate Probit; South Africa

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1. Introduction

Smoking is one of the known lifestyle behaviour choices that have severe impact on the health of population. It is an act of inhaling and exhaling fumes from burning substance especially tobacco and marijuana into the body through the respiratory system (Rose et al., 2022). Worldwide, cigarette smoking is the major form of tobacco use worldwide, other types of tobacco smoking products include roll-your-own, water-pipe, bidis and kreteks, smokeless, cigarillos, cigars, and pipe tobacco products. However, irrespective of the type of tobacco smoking product, all types are harmful, and there is no safe level of exposure to tobacco. According to the World Health Organization [WHO] (2021a) about 1.3 billion persons are estimated to be users of tobacco products, out of which 80% live in countries that are categorized as middle- and low-income. Similarly, the recently conducted Global Adult Tobacco Survey in South Africa (GATS-SA) estimated that 12.7 million South African adults (i.e., 29.4% of adult population) are current users of both smoked and smokeless tobacco product. Of these statistics, 41.7% are men while 17.9% are women. This high tobacco smoking behaviour prevalence is an epidemic, as it is one of the riskiest health behaviours and the biggest public health threat across the world (Mahdaviazad et al., 2022), and in South Africa.

The health consequences and burden of smoking are quite large, Ekpu and Brown (2015) highlighted that cigarette smoking is a major contributor to chronic obstructive pulmonary disease, peripheral and cerebrovascular disease, coronary artery disease (CAD), nonmalignant diseases of the mouth, peptic ulcer disease, and cancer of the cervix, bladder, pharynx, larynx, esophagus, kidney, and pancreas. Also, passive or second-hand smoking can lead to coronary heart disease, heart attacks, and chronic respiratory symptoms among people of all ages. Moreover, it causes cardiovascular and respiratory diseases in adults, low birth weight for infants and children, sudden infant death syndrome, and worsens a range of mild to severe respiratory effects (WHO, 2021b). Härkönen et al., (2018), also noted that smoking behaviour of a pregnant mother is a top reason of undesirable birth outcomes which can have socioeconomic and health effects across life course. Furthermore, these unhealthy lifestyles and their associated diseases make individuals more vulnerable in times of pandemics as seen in the global COVID-19 situation (Calina et al., 2021; Moultire et al., 2021; Patanavanich and Glantz, 2021; WHO, 2020).

The provided statistics of smoking prevalence and its consequences necessitate a continuous understudy of factors that promote smoking and ways of mitigating against it. However, it is known from literature that the study of smoking behaviour has been majorly considered in isolation, without considering the possibility of their clustering and transition. That is, several studies have attempted to answer the question why people smoke or what are the factor that influence smoking, but the question why previously non-smoker take up smoking behaviour and why to some persons remain persistent smoker have rarely been investigated.

Smoking transition refers to the changes in smoking behaviour, it could be changes from the use of tobacco to non-use status, and from non-use status to use status, or initiation-cessation-relapse back into tobacco usage as clearly stated by Hyland et al. (2020). It can also be a maintenance of a non-smoking status or persistence in smoking behaviour, which in this case is no transition. Another aspect of smoking transitions is the changes in the frequency of smoking, such as from regular (daily) smoking to irregular (occasional, monthly) smoking and vice versa. Other smoking transitions include transitions between smoking stages, abstinence over time, and use of alternative nicotine products (Simonavicius et al., 2020). Switching between tobacco products e.g., cigarettes, smokeless tobacco products (chewing tobacco, snuff, and snus), electronic nicotine delivery

systems (ENDS), hookah (e.g., water-pipe, shisha), and cigars are inclusive of smoking transition dynamics (Chang et al., 2018; Kasza et al., 2018).

Thus, despite extensive research on smoking behaviour, much of the existing literature has largely and primarily focused on identifying the factors that influence individuals smoking behaviour and transition from one tobacco product to another. However, there is a significant gap in understanding the dynamics of smoking behaviour transitions, specifically on why some previously non-smokers take up smoking and why certain individuals persist in smoking despite awareness of its health risks. Moreover, there is limited research that explores these transitions within the specific context of South Africa, where smoking prevalence remains alarmingly high.

Pronk et al. (2004) pointed out that more research is needed to elucidate on smoking lifestyle factors and changes, and variables that may predict them. Simon et al., (2020) also argued that understanding transition patterns could inform policy interventions and development to prevent behavioural change from less diverse (i.e., fewer products) to more diverse use profiles and non-use to use. According to Pronk et al., (2004), the failure to recognize the prevalence, clustering and change patterns of lifestyle-related health behaviour including smoking and their determinants may affect the provision of necessary assistance and efforts that are needed towards the goal of reducing the occurrence of disease, managing existing chronic diseases, and improving overall health outcomes. Therefore, this study aims to provide an understanding of the predictors for smoking behaviour uptake and persistence among adults in South Africa.

2. Methodology

2.1. Data source

This study is based on a cross-sectional research design and quantitative research method. Primarily, the fifth wave of the National Income Dynamics Survey (NIDS) survey collected by the Southern Africa Labor Development Research Unit (SALDRU) at the University of Cape Town and funded by the South African President's Office and the Department of Planning, Monitoring and Evaluation was used for this study. However, the third wave of the panel was also used to capture the targeted transition variable.

The study considered information of 18718 persons who are aged 18 and older. The decision to compare the 2012 and 2017 survey periods in this study is based on several key considerations. Using the 2012 third wave and 2017 fifth wave offer a unique opportunity to capture temporal dynamics in smoking uptake and persistence. Smoking patterns and behaviours can shift due to various factors, such as changes in societal attitudes, economic conditions, or public health interventions. The five-year interval between these survey periods allows the exploration of transitions in smoking behaviour, including initiation, persistence, cessation, and relapse, providing insights into both short- and mid-term trends. The study data was accessed through the DataFirst website (https://www.datafirst.uct.ac.za/). The NIDS survey is a face-to-face, longitudinal survey of individuals and their households living in South Africa. A comprehensive description of the datasets used in this study is available at www.nids.uct.ac.za.

The NIDS asks questions relating to “whether a respondent smoke cigarette or not”. The transition variable was derived for comparing the smoking status for the 2013 and 2017 survey periods. Consequently, the

transition variable for smoking has 4 categories: 1) never smoked in both periods (maintained healthy behaviour status), 2) did not smoke in 2012 but began to smoke in 2017 (initiated smoking behaviour), 3) smoked in 2012 but not in 2017 (quit smoking), and 4) smoked in both time periods (maintained smoking behaviour). However, this study however focuses on smoking behaviour patterns 1 (initiated smoking behaviour) and 4 (maintained smoking behaviour). Other information obtained in the NIDS survey data include, health status (good), medical aid coverage, employment status, gender (male), age (18-34 years, 35-64 years, > 64 years), marital status (married, otherwise), education level (primary, secondary, matric, certificate and diploma, degree), employment status (employed and unemployed), race (African, Colored, place of residence (urban, rural), and province (Western Cape (WC), Eastern Cape (EC), Northern Cape (NC), Free State (FS), KwaZulu Natal (KZN), North–West (NW), Gauteng, Mpumalanga, Limpopo).

2.2. Analytical approach

Descriptive statistics (frequency, percentages, and tables) were used in the study to summarize respondents' characteristics, profile health behavior changes or maintenance patterns, and identify their potential determinants. Bivariate probit regression estimation technique was utilized in investigating the predictors of smoking behaviour uptake and smoking behaviour persistence. The bivariate probit regression estimation technique is used to simultaneously analyze two binary outcomes that may be correlated. The two outcomes in this study (smoking behaviour uptake and smoking behaviour persistence) are each coded as 1 and 0, respectively All the analyses in this study were conducted using STATA 15 software.

The bivariate probit model is particularly suited for this analysis because it simultaneously models two binary outcome variables that may be correlated. In this study, the two outcomes of interest are (1) smoking uptake (when a previously non-smoker becomes a smoker) and (2) smoking persistence (when a smoker continues smoking over time). The choice of the bivariate probit model is justified by the nature of the data and the research questions. Smoking uptake and persistence are not independent processes; they are likely influenced by similar factors, such as socioeconomic status, education, and health awareness. Moreover, the error terms associated with these two outcomes may be correlated, indicating that unobserved factors could simultaneously affect both smoking uptake and persistence. The bivariate probit model accounts for this potential correlation, providing more accurate and reliable estimates than separate univariate probit models would.

3. Results

Among the 18,718 respondents, a higher proportion were female (57.09%), unmarried (76.15%), aged between 35-64 years (48.57%), attained secondary education (28.56%), unemployed (65.75%), had no medical coverage (92.80%), had good health status (61.82%), reside in urban area (52.88%), as shown in Table 1. Regarding smoking behaviour, comparatively, smoking behaviour uptake and persistence prevalence is higher for male gender, married, aged group 35-64 years, employed, those with perceived good health status and urban residents, as shown in Table 1.

Table 1. Sociodemographic characteristics (total and by smoking behaviour)

	Total (%)	Smoking Behaviour		
		Others (%)	Smoking Behaviour Uptake (%)	Smoking Behaviour Persistency (%)
Gender				
Female	57.09	93,85	2,58	3,57
Male	42.91	74,08	11,23	14,68
Marital Status				
Yes	23.85	83.76	5.78	10.46
Otherwise	76.15	85.88	6.45	7.67
Age				
18-34 Years	39.04	84,5	8,7	6,8
35-64 Years	48.57	84,49	5,27	10,24
> 64 Years	12.38	91,59	2,72	5,69
Education Attainment				
No Schooling	23.62	96,11	1,54	2,35
Primary	15.93	78,34	7,58	14,08
Secondary	28.56	78,58	9,63	11,78
Matric	12.77	86,45	6,52	7,03
Certificate and Diploma	16.27	86,18	6,5	7,32
Degree	2.84	94,36	2,82	2,82
Employment Status (Employed)				
No	63.75	89,83	4,37	5,8
Yes	36.25	77,53	9,67	12,79
Medical Insurance Coverage				
No	92.80	85,6	6,29	8,11
Yes	7.20	82,48	6,31	11,21
Health Status				
Good	61.82	79.73	8.96	11.30
Poor	38.18	94.5	1.97	3.53
Population Group				
African				
Yes	22.98	88,09	5,58	6,33
No	77.02	76..26	8.69	15.04
Coloured				
Yes	15.15	68,25	11,43	20,32
No	84.85	88.43	5.38	6.20
Place of Residence				
Rural	47.12	89,69	4,71	5,6
Urban	52.88	81,52	7,71	10,77

Province				
WC	13.37	75,74	7,67	16,59
EC	9.71	84,92	6,27	8,81
NC	7.20	72,03	12,39	15,58
FS	5.29	81,94	6,36	5,22
KZN	24.56	89,45	5,33	5,22
NW	5.92	84,49	8,39	7,12
Gauteng	13.17	86,21	6,29	7,51
Mpumalanga	6.73	87,07	6,67	6,27
Limpopo	7.45	89,88	4,66	5,45
Total (100%)	100	85,37	6,29	8,33

**Others include smoking behaviour quitters and persistent non-smokers*

Table 2. Predictors of smoking behaviour uptake and persistence

	Smoking Uptake			Smoking Persistency		
	Coef.	[95% Conf. Interval]		Coef.	[95% Conf	Interval]
Age	-0.1569*	-0.2126	-0.1011	0.1559*	0.1053	0.2065
Gender	0.7881*	0.7209	0.8553	0.8716*	0.8089	0.9343
Married	-0.1524*	-0.2315	-0.0733	-0.1009*	-0.1700	-0.0318
Education	-0.0472*	-0.0743	-0.0201	-0.0702*	-0.0955	-0.0448
Employed	0.0725**	0.0038	0.1411	0.1729*	0.1080	0.2378
Medical Aid	-0.1903*	-0.3129	-0.0677	-0.0062	-0.1127	0.1004
Health Status (Good)	0.8270*	0.7360	0.9179	0.7426*	0.6642	0.8210
African	-0.1351***	-0.2845	0.0143	-0.0587	-0.19214	0.0747
Coloured	0.2817*	0.1218	0.4415	0.5865*	0.4463	0.7267
Urban	0.1199*	0.0404	0.1995	0.0886**	0.0132	0.1641
WC	0.1221	-0.0417	0.2859	0.4333*	0.2835	0.5830
EC	0.2404*	0.0843	0.3966	0.3555*	0.2091	0.5019
NC	0.3508*	0.1837	0.5180	0.3393*	0.1811	0.4974
FS	0.2552*	0.0687	0.4416	0.5817*	0.4141	0.7492
KZN	0.1945*	0.0595	0.3295	0.1860*	0.0557	0.3162
NW	0.5155*	0.3511	0.6799	0.3485*	0.1827	0.5143
Gauteng	0.1973**	0.0396	0.3549	0.3298*	0.1800	0.4797
Mpumalanga	0.2655*	0.0956	0.4353	0.2512*	0.0847	0.4176
Constant	-2.4190*	-2.6492	-2.1888	-2.9739*	-3.1902	-2.7576
Rho	-0.9977	0.1664			-1	1
Number of obs.	18718					
Log likelihood	-7800.2722					
Wald chi2(36)	3690.59					
Prob > chi2	0.0000					

*Wald test of rho=0: chi2(1) = 484.079; Prob > chi2 = 0.0000; *p<0.01, ** p<0.05,** * p<0.10*

The results of the bivariate probit regression estimate on the predictors of smoking behaviour uptake and persistency are shown in Table 2. The first step in econometric modelling is to test the existence of multicollinearity among the variables originally proposed. The choice of including a variable or not is made by examining the variance inflation factor (VIF) of each of the variables. Any variable(s) that has a VIF that s more than 10 failed the collinearity test and it is subsequently excluded in the estimation. The VIF variables included in the analysis ranges between 1.09 and 2.96. Likewise, the average variance inflation factor (VIF) for each of the models is 1.73, which is less than 10, indicates the non-existence of the problem of multicollinearity. Estimates derived from the bivariate probit models fit the data accurately by looking at the statistical significance of the Wald chi-square statistics ($p<0.01$) of the estimated models. Equally, the likelihood ratio test of rho that is reported for the models equal to zero rejects the null hypothesis that there is no correlation ($p<0.01$). This indicates that the two error terms of the smoking behaviour uptake and smoking behaviour persistency model are indeed correlated and estimating each model independently using conventional probit model would yield a biased estimate. The results from the bivariate probit estimation show that smoking uptake and persistence are significantly influenced by the same variables, with the direction of influence being consistent across both outcomes but strength of influence varying, except for age, which negatively affects smoking uptake but positively impacts smoking persistence.

4. Discussion

The study profile and identified potential predictors of smoking behaviour uptake and persistence. As reported in the Table 2, the parameter results of the gender (male) are positive and statistically significance at 1 precent level of significance. The result indicates that given that the other variables in the model are held constant, being a man increases the likelihood of taking up a smoking behaviour and retain such smoking behaviour. This result is consistent with Vatankhah et al., (2020), Masjedi et al. (2020), and Nugroho and Atmanti (2020), that found that men have higher likelihood of engaging in cigarette smoking habit. Probable reasons for the result are lowered social behaviour expectations for men compared to women, a higher stress level for men compared to women, a low perception of risky behaviour and poor health consciousness of men.

The age parameters in Table 2 are negative and statistically significant ($p<0.05$) for smoking uptake, whereas it is positive and statistically significant for the smoking behaviour persistency model, it is negative for smoking behaviour up take. The result suggests that as age increases the likelihood of initiating a smoking behaviour from a previously non-smoking behaviour reduces given that the other variables are held constant. This result is so because it is known that younger people, and generally adolescents tend to engage in riskier health behaviour than older people. Similarly, perceived less vulnerability, poor risk consciousness, and poor perception of the future impact of smoking also account for people between the ages of 22 and 34 years to transition into unhealthy smoking behaviour. The results in Table 2 further showed that increase in age increases continuity of smoking behaviour. This is probably due to smoking behaviour addiction that has developed overtime especially during young adult period (ages 22-35 years). This is an indication that age-targeted interventions to curb smoking initiation should focus on youth and young adults (Balocchini and Chiamenti, 2013; Van den Bos and Hertwig, 2017).

The coefficients of marital status (married) are negative and statistically significant for the smoking behaviour uptake and maintenance, respectively as presented in Table 2. It suggests that being married

significantly reduces the probability of transitioning to a new smoker ($p < 0.05$) or remaining a consistent smoker. These results confirm the protective effect of marriage in relation to unhealthy behaviour as posited by Josefsson et al., (2018). This finding is in line with Nugroho and Atmanti (2020), Hilz and Wagner (2018), and Qattan et al., (2021), that were conducted in Indonesia and Saudi Arabia, respectively.

Furthermore, the results of the employed variable as indicated in Table 2 are positive and statistically significant at 1 percent level of significance. The implies that moving from non-smoking status to a current smoking status and remaining a smoker would likely increase by 0.072 and 0.173, respectively, for being employed, given that the other variables in the model remain constant. This suggests that employed individuals compared to unemployed persons are more likely to be in the smoking transition groups of new smokers and persistent smokers. The result is also consistent with the studies (Phaswana-Mafuya et al., 2018; Cheah et al., 2019) conducted in South Africa and Malaysia where it was found that being employed increases the probability of tobacco smoking compared to being unemployed. A plausible reason for this result is that some employed persons irrespective of the price still have the resources to purchase cigarettes. Other reason for this result can be viewed from the perspective of the type or sector of work some individuals are into, like substandard informal, part-time, or temporary jobs which are prevalent in the country. For instance, the result is consistent with Jung et al., (2013), that found that individuals in precarious (temporary, part-time or daily) and indecent employment have increased likelihood of being current smokers, heavy smokers, and less likelihood of being quitters compared to those in standard working conditions. Similarly, factors such as job stress, hazardous working conditions, workplace social capital, and workplace culture of smoking as noted by Ukuhor and Abdulwahab (2018) are plausible reasons for the positive and significant effect of employment status (being employed) on smoking initiation and persistence.

With reported coefficients of -0.0472 and -0.0702 for the education variable at $p<0.01$, it can be concluded that if all other variables held constant, increase in the level of education attained reduces the likelihood of initiating smoking behaviour or retaining a smoking behaviour. This finding is consistent with previous studies (Wang et al., 2018; Lee and Lee, 2019; Hasan et al., 2021; Ruokolainen et al., 2021) that have demonstrated education to be an important socioeconomic indicator that may influence health behaviour patterns through individual awareness, knowledge, and enablement to make health-promoting decisions. Ruokolainen et al., (2021) in their study concluded that higher education levels are associated with smoking cessation among adults in general, especially men in Finland.

The parameters of perceived health status (good) variable are statistically significant ($p<0.01$) and positive as reported in columns 2 (0.8270) and 5 (0.7426) of Table 2. The results suggest that if an individual were to perceive him or herself as having good health status, he or she will more likely than those with perceived poor health status adopt a smoking behaviour if not previously a smoker or retain a smoking behaviour. This result is inconsistent with the a priori expectation of this study that to retain good health status or recover from poor health status individuals might do away with unhealthy behaviour like smoking. The finding is also not consistent with findings from previous empirical studies that those with good self-rated health status were less likely to smoke than those with perceived bad health status (Lee and Lee, 2019). Likewise, Cheah and Naidu (2012) concluded that individuals with poor health having been diagnosed with diabetes or hypertension are also less likely to smoke as they are more alert to their health condition. However, the plausible reasons for a healthy individual to initiate smoking behaviour or remain as persistent smoker despite the known risk of smoking include peer influence from social capital and current stress experience, under-

estimation or partial knowledge of the risk of smoking behaviour on health and acceptance of the myth that exercise (for smokers that engage in exercise) undo most smoking effects (Lanari et al., 2022; Kaufman et al., 2020; Weinstein et al., 2005). Equally, the fact that health shocks linked to risky behaviours (such as lung cancer from smoking) occur only after years of engaging in the behaviour could encourage individuals perceived to be in good health to continue to engage in unhealthy smoking behaviour (CDCP, 2024).

In the Table 2, the coefficients of the urban variable are positive and statistically significant for smoking behaviour uptake (coef. = 0.1199) and persistent smoking (coef. = 0.0866). The result shows that residing in urban area increase the likelihood of initiating a smoking behaviour from a previous non-smoking status and retaining a smoking behaviour, respectively compare to residing in rural areas, given all other variables are held constant. Apparently, it is clear from the result that residency in urban areas increases the likelihood of becoming a new smoker compared to residing in rural areas. This is consistent with Phaswana-Mafuya et al., (2018) and a probable reason for the result is because of urbanized lifestyle and higher availability of cigarette and alcohol sales centres in urban areas than rural areas. This is further buttressed by Tagoe and Dake (2011), who noted that urbanization is one of the major drivers of unhealthy lifestyles, a process that has amplified the lifestyle risk factors of NCDs (Juma et al., 2019). City life is linked with economic transition of individuals, relative access to employment and income, decreased hours of rest or leisure, and increased levels of stress that could stimulate engaging in activities like drinking and smoking that are perceived to be stress reducers.

5. Conclusion and recommendations

This study uses data from the fifth wave of the National Income Dynamics Survey (NIDS) survey to examine the potential sociodemographic predictors that influence the initiation and continuation of smoking behaviours, respectively among South African adults. Descriptive statistics, frequency analysis, percentages, and bivariate probit regression are used in this study. Key variables include gender, age, marital status, employment status, education, perceived health status, and urban residence. Results show significant correlations between these variables and smoking behaviour, indicating patterns and trends that can serve as the basis for targeted interventions. The study concludes that male gender increases the likelihood of starting and continuing to smoke. Age is also positively associated with smoking continuation, as younger age groups are more likely to start smoking, likely due to onset of dependence in young adulthood. Marital status, particularly being married, is associated with a decreased likelihood of initiating or maintaining smoking behaviour. Employment status is an important factor because employed people are more likely to become new or persistent smokers, perhaps due to economic resources or certain work-related stressors. Higher education level is negatively associated with smoking behaviour, suggesting that higher education reduces the likelihood of starting or continuing to smoke. Surprisingly, people who consider themselves healthy are more likely to adopt or maintain a smoking habit. Based on these findings, targeted interventions for adolescents and young adults, promotion of healthy marital relationships, job-specific interventions, educational campaigns, reassessment of health perceptions of smoking, and urban health initiatives are needed in the pursuit of decrease smoking habits. Given age-related patterns, smoking control efforts should focus on adolescents and young adults, especially those aged 22 to 34 years. Also, the established protective effect for married individuals, suggest that programs that promote healthy marital relationships may help reduce smoking behaviour. Equally, tailored interventions targeting specific occupational sectors, particularly those with

precarious or substandard employment conditions, may be effective in preventing the emergence and persistence of smoking. Public health campaigns should emphasize the role of education in reducing smoking behaviour, targeting both adolescents and adults to raise awareness and promote healthier choices. Likewise, strategies should be considered to correct misconceptions about the link between health perception and smoking, with a focus on educating individuals about the long-term health risks associated with smoking. Urban areas should be a focal point for health initiatives, considering the higher likelihood of smoking initiation and persistence in these regions. Policies addressing lifestyle risk factors, such as increased access to tobacco, could be beneficial. This study has several limitations that need to be identified and recognized. A limitation is identified in this study, this is the fact that changes in health behaviour is not a one-off event. It is often a dynamic process subject to changing socioeconomic situations and experiences, however, these was not considered in this study. Thus, considering how transition in socioeconomic situations influence health behaviour changes is an area of future research.

References

Balocchini, E. and Chiamenti, G. (2013) "Adolescents: which risks for their life and health?", *Journal of Preventive Medicine and Hygiene*, Vol. 54 No. 4, pp. 191-194.

Calina. D., Hartung, T., Mardare, I., Mitroi, M., Poulas, K., Tsatsakis, A., Rogoveanu, I. and Docea, A.O. (2021), "COVID-19 pandemic and alcohol consumption: Impacts and interconnections", *Toxicology Reports*, Vol. 1 No. 8, pp. 529-535.

Centers for Disease Control and Prevention (CDCP) (2024), "*Health Effects of Cigarettes: Cancer"*, available at: https://www.cdc.gov/tobacco/about/cigarettes-and-cancer.html (Accessed September, 2024).

Chang, J.T., Levy, D.T. and Meza, R. (2018), "Examining the transitions between cigarette and smokeless tobacco product use in the United States using the 2002–2003 and 2010–2011 longitudinal cohorts", *Nicotine & Tobacco Research,* Vol. 25 No. 20(11), pp. 412-416.

Cheah, Y.K. and Naidu, B.M, (2012), "Exploring factors influencing smoking behaviour in Malaysia", *Asian Pacific Journal of Cancer Prevention,* Vol. 13 No. 4, pp. 1125-1130.

Cheah. Y.K., Abdul Adzis, A., Abu Bakar, J. and Applanaidu, S.D. (2019), "Factors associated with demand for tobacco across Malaysia regions: Participation and level of consumption", *International Journal of Business and Society,* Vol. 1 No. 20(3), pp. 1160-1177.

Ekpu, V.U. and Brown, A.K. (2015), "The economic impact of smoking and of reducing smoking prevalence: review of evidence", *Tobacco Use Insights*, Vol. 8 No. TUI-S15628.

Global Adult Tobacco Survey (GATS), *Fact sheet South Africa, 2021*. Pretoria: National Department of Health. 2022. Available from https://www.health.gov.za/wp-content/uploads/2022/05/Global-Adult-Tobacco-Survey-GATS-SA_FS-Populated__28-April-2022.pdf (Access 12 Dec. 2024).

Härkönen, J., Lindberg, M, Karlsson, L., Karlsson, H. and Scheinin, N.M. (2018), "Education is the strongest socio-economic predictor of smoking in pregnancy", *Addiction*, Vol. 113 No. 6, pp. 1117-1126.

Hasan, M.M., Quazi, A., Sarangapani, N., and Alam K. (2023), "Age-specific prevalence and predictors of tobacco consumption among male adults in India: subnational inequality and associated risk factors", *Journal of Public Health*, Vol. 1, pp. 1-11.

Hilz, R, and Wagner, M. (2018), "Marital status, partnership and health behaviour: findings from the German ageing survey (DEAS)", *Comparative Population Studies-Zeitschrift für Bevölkerungswissenschaft*, Vol. 43, pp. 65-97.

Hyland, A., Kasza, K.A., Borek, N. and Kimmel, H.L. (2020), "Taylor KA, Compton WM, Day H, Donaldson EA, Sharma E, Anic G, Edwards KC. Overview of tobacco use transitions for population health", *Tobacco control*, Vol. 1 No. 29, pp. 134-138.

Josefsson, K., Elovainio, M., Stenholm, S., Kawachi, I., Kauppi, M., Aalto, V., Kivimäki, M. and Vahtera, J. (2018), "Relationship transitions and change in health behavior: A four-phase, twelve-year longitudinal study", *Social Science & Medicine,* Vol. 1 No. 209, pp. 152-159.

Juma, K., Juma, P.A., Shumba, C., Otieno, P. and Asiki, G. (2019), "Non-communicable diseases and urbanization in African cities: a narrative review. Public Health in Developing Countries-Challenges and Opportunities", Vol. 15 No. 15, pp. 31-50.

Jung, Y., Oh, J., Huh, S. and Kawachi, I. (2013), "The effects of employment conditions on smoking status and smoking intensity: The analysis of Korean Labor & Income Panel 8th–10th wave: *PloS One*, Vol. 20 No. 8(2), e57109.

Kasza, K.A., Borek, N., Conway, K.P., Goniewicz, M.L., Stanton, C.A., Sharma, E., Fong, G.T., Abrams, D.B., Coleman, B., Schneller, L.M. and Lambert, E.Y. (2018), "Transitions in tobacco product use by US adults between 2013–2014 and 2014–2015: findings from the PATH Study Wave 1 and Wave 2", *International Journal of Environmental Research and Public Health*, Vol.15 No. 11, pp. 2515.

Kaufman, A.R., Twesten, J.E., Suls, J., McCaul, K.D., Ostroff, J.S., Ferrer, R.A., Brewer, N.T., Cameron, L.D., Halpern-Felsher, B., Hay, J.L., and Park, E.R. (2020), "Measuring cigarette smoking risk perceptions", *Nicotine and Tobacco Research,* Vol. 22 No. 11, 1937-1945.

Lanari, D., Pasqualini, M. and Pieroni, L. (2020), "Is it Time to Quit? Smoking Persistence and Self-Rated Health", *Journal of Population Ageing*, pp. 1-8.

Lee, Y., Lee, K.S. (2019), "Factors related to smoking status among young adults: an analysis of younger and older young adults in Korea", *Journal of Preventive Medicine and Public Health*, Vol. 52 No. 2, pp. 92.

Mahdaviazad, H., Foroutan, R. and Masoompour, S.M. (2022), "Prevalence of tobacco smoking and its socioeconomic determinants: Tobacco smoking and its determinants", *The Clinical Respiratory Journal*, Vol. 16 No. 3, pp. 208-215.

Masjedi, M.R., Roshanfekr, P., Naghdi, S., Higgs, P., Armoon, B., Ghaffari, S. and Ghiasvand, H. (2020), "Socio-economic contributors to current cigarette smoking among Iranian household heads: findings from a national household survey", *Journal of Substance Use,* Vol. 3 No. 25(2), pp. 217-23.

Moultrie, T.A., Dorrington, R.E., Laubscher, R., Groenewald, P., Parry, C.D., Matzopoulos, R. and Bradshaw, D. (2021), "Unnatural deaths, alcohol bans and curfews: Evidence from a quasi-natural experiment during COVID-19", *South African Medical Journal,* Vol. 1 No. 111(9), pp. 834-837.

Nugroho, P.A. and Atmanti, H.D. (2020), "The Effect of Socio-Economic Factors on the Individual Smoking Status: Case of Indonesia", *Jurnal Ekonomi & Studi Pembangunan*, Vol. 11 No, 21, pp. 161-169.

Patanavanich, R. and Glantz, S.A. (2021), "Smoking is associated with worse outcomes of COVID-19 particularly among younger adults: a systematic review and meta-analysis", *BMC Public Health*, Vol. 21, pp. 1-9.

Phaswana-Mafuya, N., Peltzer, K. and Pengpid, S. (2018), "Concurrent tobacco use and risky drinking in South Africa: results from the South African National Health and Nutrition Examination Survey", *Journal of Psychology in Africa*, Vol. 4 No. 28(4), pp. 316-322.

Pronk, N.P., Anderson, L.H., Crain, A.L., Martinson, B.C., O'Connor, P.J., Sherwood, N.E., and Whitebird. R.R. (2004), "Meeting recommendations for multiple healthy lifestyle factors: prevalence, clustering, and predictors among adolescent, adult, and senior health plan members", *American Journal of Preventive Medicine*, Vol. 1 No. 27(2), pp. 25-33.

Qattan, A.M., Boachie, M.K., Immurana, M. and Al-Hanawi, M.K. (2021), "Socioeconomic determinants of smoking in the Kingdom of Saudi Arabia", *International Journal of Environmental Research and Public Health*, Vol. 25 No. 18 (11), pp. 5665.

Rose, C.A., Henningfield, J.H., Matthew, J., Sweanor, D.T. (2022), "smoking". *Encyclopedia Britannica*, 2022, https://www.britannica.com/topic/smoking-tobacco. (Accessed 28 November 2022).

Ruokolainen, O., Härkänen, T., Lahti, J., Haukkala, A., Heliövaara, M. and Rahkonen, O. (2021), "Association between educational level and smoking cessation in an 11-year follow-up study of a national health survey", *Scandinavian Journal of Public Health*, Vol. 49 No. 8. Pp. 951-60.

Simon, P., Buta, E., Gueorguieva, R., Kong, G., Morean, M.E., Camenga, D.R., Bold, K.W. and Krishnan-Sarin, S. (2020), "Transitions across tobacco use profiles among adolescents: results from the Population Assessment of Tobacco and Health (PATH) study waves 1 and 2", *Addiction*, Vol. 115 No. 4, pp. 740-747.

Simonavicius, E., McNeill, A. and Brose, L.S. (2020), "Transition in smoking and nicotine use from2016 to 2017 among UK cohort of adult smokers and ex-smokers", *Drug and Alcohol Review*, Vol. 39 No. 7, pp. 994-1005.

Tagoe, H.A. and Dake, F.A. (2011), "Healthy lifestyle behaviour among Ghanaian adults in the phase of a health policy change", *Globalization and Health,* Vol. 7, pp. 1-9.

Ukuhor HO, Abdulwahab AA. Prevalence and workplace correlates of tobacco smoking among male expatriate workers in Riyadh, Saudi Arabia. Eastern Mediterranean Health Journal. 2018;24(12):1155-64.

Van Den Bos, W, and Hertwig, R. (2017), "Adolescents display distinctive tolerance to ambiguity and to uncertainty during risky decision making", *Scientific Reports*, Vol. 18 No. 7(1), pp. 40962.

Vatankhah, S., Naghdi, S., Ghiasvand, H., Armoon, B. and Ahounabr, E. (2020), "Current cigarette smoking among Iranian elders; what are the prevalence, inequality and socioeconomic determinants? An analysis on Iranian Rural and Urban Income-Expenditure Survey 2017", *Journal of Addictive Diseases*, Vol. 2 No.38(3), pp. 257-62.

Wang. Q., Shen, J.J., Sotero, M., Li, C.A. and Hou, Z. (2018), "Income, occupation and education: Are they related to smoking behaviors in China?", *PloS One,* Vol. 8 No. 13(2), pp. e0192571.

Weinstein, N.D., Marcus, S.E., and Moser, R.P., (2005), "Smokers' unrealistic optimism about their risk", *Tobacco Control*, Vol. 1 No. 14(1), pp. 55-59.

World Health Organization (2021a), *WHO global report on trends in prevalence of tobacco use 2000-2025*, fourth edition. Geneva: World Health Organization.

World Health Organization (2021b), "Tobacco control to improve child health and development: Thematic Brief", available at: https://iris.who.int/bitstream/handle/10665/340162/9789240022218-eng.pdf (Accessed 15 Dec. 2024).

World Health Organization. (2020), "Smoking and COVID-19: Scientific brief", available at: https://www.who.int/publications/i/item/WHO-2019-nCoV-Sci_Brief-Smoking-2020.2 (Accessed 15 Dec. 2024).