

Review Article

Trend of tobacco use: Reviewing the STEPS surveys conducted in Nepal

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Abstract

The trend of tobacco use has changed over time in the world including Nepal. This study aimed to describe the trend of tobacco use in Nepal, is based on the review of the findings of three consecutive STEP wise approaches to non-communicable disease risk factor surveillance (STEPS) survey 2007, conducted by Society for Local Integrated Development Nepal (SOLID Nepal), and STEPS surveys 2013 and 2019, conducted by Nepal Health Research Council (NHRC). This study only compared the proportion of people who consumed tobacco during these surveys based on sex, age group, and age of initiation of tobacco use to describe the trend of tobacco use. The trend of any tobacco use, smoked tobacco use, and smokeless tobacco (SLT) use declined to 28.9% from 37.1%, to 17.1% from 26.2%, and to 18.3% from 18.6%, respectively during the period of 2007 to 2019. It shows that the prevalence of any tobacco use, smoked tobacco use and SLT use were in decreasing trend among men and women. In order to reduce it further, the government should conduct tobacco cessation programs considering SLT.

Keywords: age of initiation of tobacco use, prevalence of tobacco use, smoked tobacco, smokeless tobacco, tobacco

Introduction

The trend of tobacco use has declined in the world. The prevalence of tobacco use among men and women in 2000, 2005, 2010, and 2015 was 33.3%, 30.1%, 27.3%, and 24.9%, respectively, in the world (World Health Organization, 2019) indicating the trend of tobacco use in the world has changed over time. For men, in 2000, 2005, 2010, and 2015, the prevalence of tobacco use was 50%, 46.4%, 43.2%, and 40.3%, respectively. Similarly, for women, in 2000, 2005, 2010, and 2015, it was 16.7%, 13.7%, 11.4%, and 9.5%, respectively. In the lower-middle-income countries, the prevalence of any tobacco use among people were 40.4%, 35.2%, 30.9%, and 27.4% in 2000, 2005, 2010, and 2015, respectively. In the South-East Asian Region, the prevalence of any tobacco use among both men and women was 46.6%, 40.4%, 35.2%, and 31.2% in 2000, 2005, 2010, and 2015, respectively.

Currently, the lower-middle-income countries and low-income countries have 25.5% and 15.3% tobacco users, respectively (World Health Organization, 2019). The European Region contributed the highest proportion of smoked tobacco users (26.2%) followed by the South-East Asian Region (16.2%) and the African Region (10.3%). Worldwide, 303 million people of age 15 and above currently use smokeless tobacco (SLT) products while at least five million SLT users were found in each region of WHO. The South-East Asian Region of WHO was the habitat of 248 million current users of SLT, where 24% of men and 11.5% of women currently use SLT.

In context of Nepal prevalence of tobacco use is higher. It was 31.8% (men-51%, women-13.7%) among people above 18 years (Nepal Development Research Institute, 2020). The prevalence of smoked tobacco and SLT was 15.6% (men- 23.1%, women- 8.5%) and 20.1% (men- 34.8%, women- 6.2%), respectively. Most (55.2%) people of age group 51-60 years consumed tobacco followed by age group above 60 years (51.7%), 41-50 years (39.2%), 31-41 years (29.7%), and 18-30 years (17.8%), and most of the young people start to consume tobacco in their early teen age.

To control higher prevalence of tobacco consumption, different initiations have been taken in different times in Nepal. Though, before 1990, policy of the Government of Nepal was to increase the tobacco production, educational and promotional activities against tobacco to prevent and control of tobacco use were in focus of the Government of Nepal during the 1990s (Khanal & Khatri, 2021). Banning use of tobacco products in public places, banning advertisement in print and electronic media, and introducing tax for per stick of cigarette were the main activities of this decade. After 2000, the Government of Nepal focused on world activities to control tobacco use in Nepal.

The Government of Nepal signed World Health Organization Framework Convention on Tobacco Control (WHO FCTC) Treaty on 3 December 2003 and approved it on 7 November 2006 (Khanal & Khatri, 2021; National Health Education Information and Communication Centre, 2018). In 2007, Nepal adopted and implemented the MPOWER policy package to reduce tobacco use (Dhimal et al., 2020) where 'M', 'P', 'O', 'W', 'E', and 'R' which indicate monitoring use of tobacco and policies regarding to it; protecting individuals from second hand smoke; offering services for quitting tobacco use; warn people how danger tobacco use is; enforcing bans on advertising, promoting and sponsoring tobacco; and raising tobacco taxes. Government of Nepal also passed the Tobacco Product (Control and Regulatory) Act, 2011 (Khanal & Khatri, 2021; National Health Education Information and Communication Centre, 2018), and the Tobacco Product (Control and Regularization) Regulation Act (Khanal & Khatri, 2021). In the same year, the printing, labeling, and packaging of tobacco products directives and provision of graphical health warnings on tobacco packages were implemented. In 2013, National Tobacco Control Strategic Plan 2013-2016 was formulated. The provision of covering the package of cigarette with graphic health warnings was increased to 90%, and Multi Sectoral Action Plan for the Prevention and Control of Non-Communicable Diseases was formulated in 2014 (Khanal & Khatri, 2021; National Health Education Information and Communication Center, 2013). In 2014, FCTC Strategy Nepal: 2030 has been implemented by Government of Nepal (National Health Education Information and Communication Centre, 2018).

Many countries including Nepal are conducting STEP wise approach to non-communicable disease risk factor surveillance (STEPS) survey to make policies and plans regarding the non-communicable diseases (NCDs). STEPS survey was initiated by WHO in 2002 considering the need of data regarding NCDs for the countries which provides framework and approach for the survey of NCDs risk factors (Riley et al., 2016). It collects data regarding to risks factors like tobacco use, harmful alcohol use, unhealthy diet (low fruit and vegetable consumption, high salt intake), physical inactivity, over weight and obesity, raised blood pressure, raised blood glucose and cholesterol that are identified by WHO (Dhimal et al., 2020). In Nepal three national level STEPS surveys have been completed in 2007, 2013 and 2019, and 2 subnational level STEPS surveys were carried out in 2007.

Tobacco use is dangerous not only to health but also to academic achievement of students. Not accelerating the tobacco cessation program will cause more than 8 million deaths in the

world by 2030 among which 80% deaths will be from the low and middle-income countries (National Health Education Information and Communication Centre, 2018). In Nepal, non-communicable diseases (NCDs) cause more than 60% deaths among which 11% (15% men and 2% women) deaths are related to tobacco use. Similarly, cognition impairment, less concentration and unable to manipulate information are experienced by smokers (Jacobsen et al., 2005), and smoking is negatively correlated with learning achievement of students (Kawafha, 2014).

Therefore, assessing the trend of tobacco use in Nepal is necessary to assist in the formulation of policy and program to reduce tobacco use which will then contribute to health promotion and educational achievement of students. In the context of Nepal, there are fewer studies regarding the trend of tobacco use based on National Demographic Health Survey. with no age of initiation of tobacco use. Some studies based on individual STEPS surveys are found. However, deficiency of studies is seen that compare STEPS surveys 2007, 2013 and 2019 of Nepal to describe the tobacco use. Therefore, this paper aims to describe the trend of tobacco use in Nepal based on three consecutive STEPS Survey - 2007, conducted by Society for Local Integrated Development Nepal (SOLID Nepal) in collaboration of Ministry of Health and Population of Nepal, and WHO (Ministry of Health and Population Government of Nepal et al., 2009); and STEPS Surveys of 2013 (Aryal et al., 2014) and 2019 (Dhimal et al., 2020), conducted by Nepal Health Research Council (NHRC) in collaboration of Ministry of Health of Nepal and WHO.

Methods and Materials

This study was based on the review of three consecutive STEPS Surveys of Nepal conducted in 2007, 2013 and 2019. These surveys were population based national cross-sectional surveys that used multi-stage cluster sampling design to sample households and eligible participants for the national representation (Dhimal et al., 2020). Only people, who were living for at least six months and had stayed in the household at the night before the survey, were included in the study. Ethical approval for the surveys were received from NHRC, and informed consent from participants were ensured (Aryal et al., 2014; Dhimal et al., 2020; Ministry of Health and Population Government of Nepal et al., 2009). A brief description about the STEPS Surveys is presented on table 1.

Table 1

Description of STEPs Survey

Title	Year	Samples	Tool	Conducted by
WHO STEPS surveillance: Non communicable diseases risk factors survey	2007/2008	Total-4328 M-1907 (44.1%) Female-2461 (55.9%)	STEPS questionnaire version 2.0	Local integrated development Nepal
non communicable diseases risk factors: STEPS survey Nepal	2013	Total-4143 Male-1336 (32.2%) Female-2807 (67.8%)	WHO NCD STEPS instrument Version 2.2	Nepal health research council
Non communicable diseases risk factors: STEPS survey Nepal	2019	Total-5593 Male-1998 (35.72%) Female-3595 (64.28%)	WHO NCD STEPS instrument version 3.2	Nepal health research council

Note. This information was collected from STEP wise approach to non-communicable disease risk factor surveillance (STEPS) Surveys 2007, 2013 and 2019, respectively.

In this review study, sex, age group, and age of initiation of first tobacco use were used as independent variables to describe the trends of tobacco use. The trend of tobacco use was described by comparing the proportion of people who consumed tobacco during STEPS Surveys 2007, 2013 and 2019. For the convenience, any tobacco use, smoked tobacco use and SLT use are used instead of current any tobacco use, current any smoked tobacco use, and current any SLT use, respectively, and any tobacco use and tobacco use have been used interchangeably in this paper.

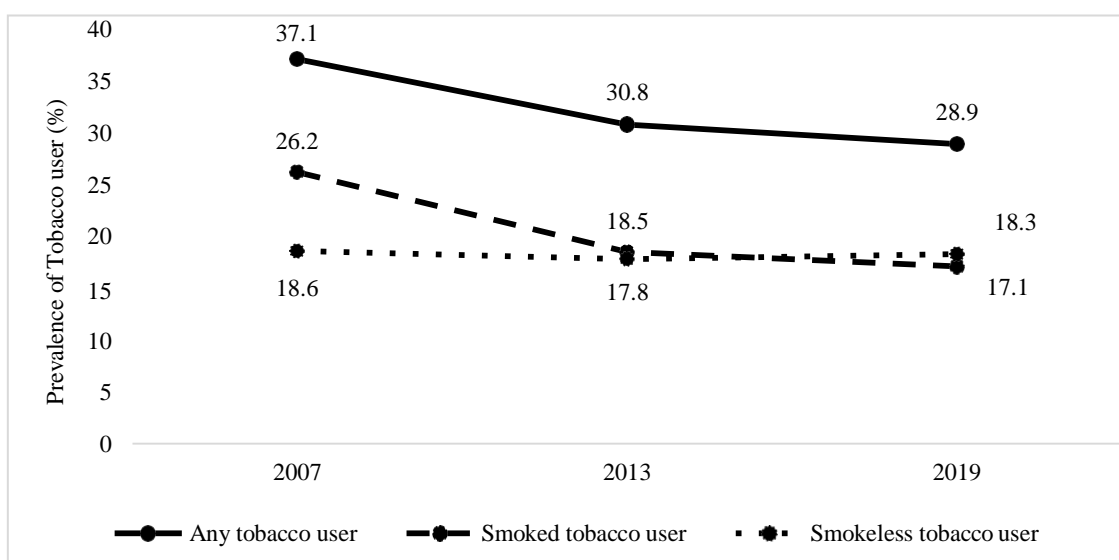
Results

Trend of Tobacco Use

Figure 1 explicates that the prevalence of any tobacco use declined to 28.9% in 2019 from 30.8% in 2013 and 37.1% in 2007. The prevalence of smoked tobacco use declined to 17.1% in 2019 from 18.5% in 2013 and 26.2% in 2007. However, the prevalence of SLT use among the respondents slightly changed from 18.6% in 2007 to 17.8% in 2013 and 18.3% in 2019.

Figure 1

Trend of Tobacco Use in Nepal



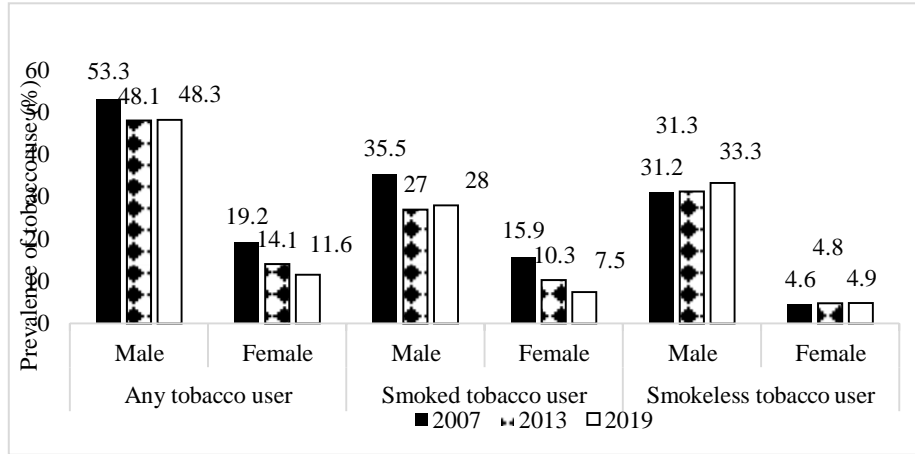
Note. Sources of these information were STEP wise approach to non-communicable disease risk factor surveillance (STEPS) Surveys 2007, 2013 and 2019, respectively.

Sexwise Trend of Tobacco Use

Figure 2 indicates that the prevalence of any tobacco use among men decreased to 48.1% in 2013 and 48.3% in 2019 from 53.3% in 2007. Likewise, the prevalence of any tobacco use among women decreased from 19.2% in 2007 to 14.1% in 2013 and 11.6% in 2019. The prevalence of smoked tobacco use declined from 35.5% in 2007 to 27% in 2013 and 27.8% in 2019 for men but it reduced to 10.3% in 2013 and 7.5% in 2019 from 15.9% in 2007. The prevalence of SLT use among men changed from 33.2% in 2007 to 31.3% in 2013 and 33.3% in 2019. For women, it increased from 4.6% in 2007 to 4.8% in 2013 and 4.9% in 2019.

Figure 2

Tobacco Use among Men and Women of Nepal



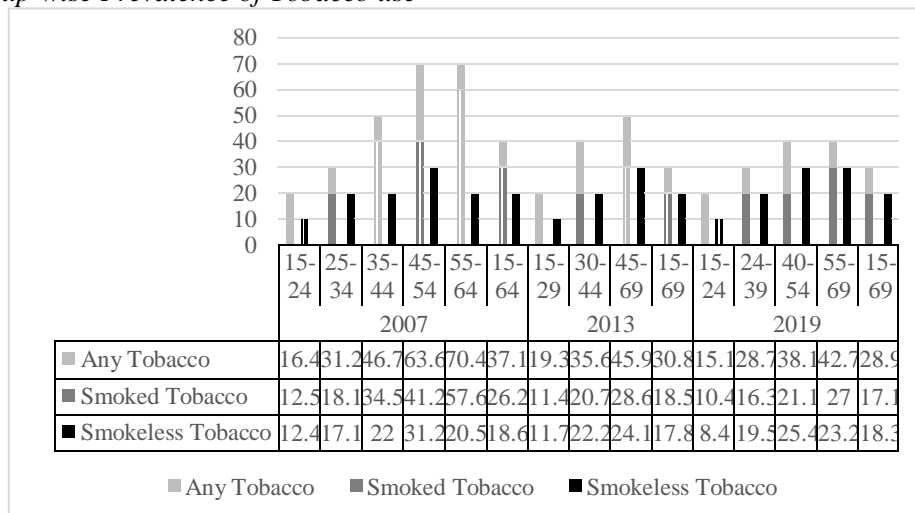
Note. Sources of these information were STEP wise approach to non-communicable disease risk factor surveillance (STEPS) Surveys 2007, 2013 and 2019, respectively.

Age-wise Trend of Tobacco Use

Figure 3 shows that among any tobacco users, in 2007, most (70.4%) of them were within the age group of 55-64 years followed by 63.6%, 46.7%, 31.2%, and 16.4% in age group of 45-54 years, 35-44 years, 25-34 years, and 15-24 years, respectively. Similarly, 57.6%, 41.2%, 34.5%, and 12.5% smoked tobacco user were in the age groups of 55-64 years, 45-54 years, 35-44 years, 25-34 years, and 15-24 years, respectively. The highest percentage (31.2%) of SLT users fell in the age group of 45-54 years followed by 22%, 20.5%, 17.1%, and 12.4% users in age groups 35-44 years, 55-64 years, 25-34 years, and 15-24 years, respectively.

Figure 3

Age Group-wise Prevalence of Tobacco use



Note. Sources of these information were STEP wise approach to non-communicable disease risk factor surveillance (STEPS) Surveys 2007, 2013 and 2019, respectively.

In 2013, most (45.9%) of the respondents who used any tobacco were in the age group of 45-69 years followed by 35.6% in 30-44 years and 19.3% in 15-29 years. Likewise, respondents who used smoked tobacco, 28.6%, 20.7%, and 11.4% fell in age group 45-69 years, 30-44 years, and 15-29 years, respectively. Among the respondents who used SLT, 24.1%, 22.2%, and 11.7% fell in age group of 45-69 years, 30-44 years, and 15-29 years, respectively.

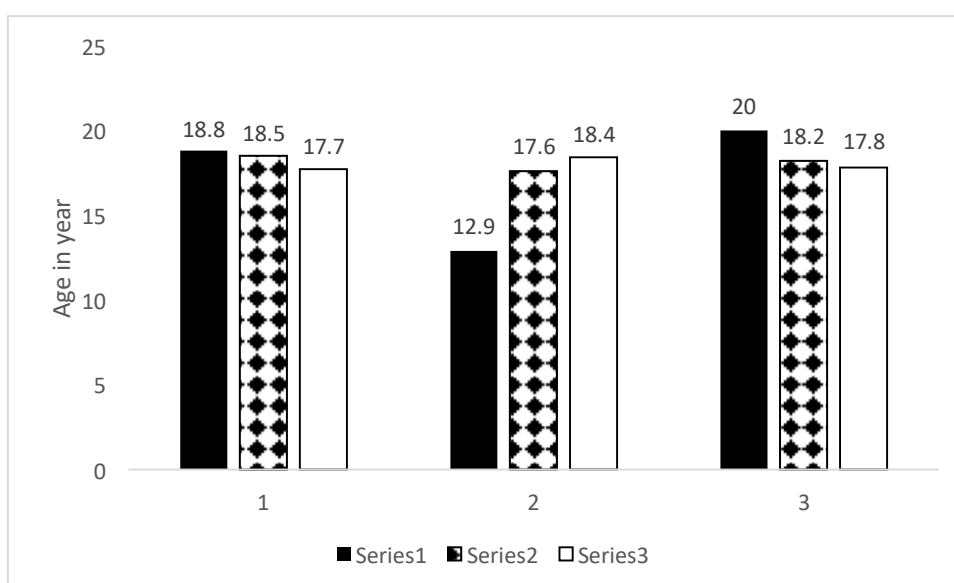
In 2019, among users of any tobacco, 42.7%, 38.1%, 28.7%, and 15.1% belonged to age group 55-69 years, 40-54 years, 25-39 years, and 15-24 years, respectively. Among the users of smoked tobacco, 27%, 21.1%, 16.3%, and 10.4% belonged to age group 55-69 years, 40-54 years, 25-39 years, and 15-24 years, respectively. Among the users of SLT, 23.2%, 25.4%, 19.5%, and 8.4% belonged to age group 55-69 years, 40-54 years, 25-39 years, and 15-24 years, respectively.

Mean Age of Initiation of Tobacco Use

Figure 4 shows that the mean age of initiation of smoking among men was 18.8 years, 18.5 years, and 17.7 years in 2007, 2013, and 2019, respectively. The mean age of women was 12.9 years in 2007 which reached to 17.6 years and 18.4 years in 2013 and 2019, respectively. However, for both men and women, the average age was 20 years, 18.2 years, and 17.8 years in 2007, 2013, and 2019, respectively.

Figure 4

Average age of Initiation of Tobacco use



Note. This information was collected from STEP wise approach to non-communicable disease risk factor surveillance (STEPS) Surveys 2007, 2013 and 2019, respectively.

Discussion

This paper aims to describe the trend of tobacco use in Nepal based on the findings of three consecutive STEPS Surveys conducted in Nepal in 2007, 2013 and 2019. It is evident from the surveys that the overall prevalence of any tobacco use, smoked tobacco use and SLT use was in declining trend. The decreasing trend of any tobacco use and smoked tobacco use was higher during 2007 to 2013 than 2013 to 2019. However, the decreasing trend of SLT use from 2007 to 2019 was negligible compared to any tobacco use and smoked tobacco use, it was seen increasing from 2013 to 2019. Sreeramareddy and Harper (2019) conducted a study based on Nepal Demographic Health Surveys from 2001 to 2016 and found similar results as this review study. They reported declining trend of tobacco use in their study. Findings of this review study are similar to the study conducted by Abdulkader et al. (2019) based on different cross-sectional studies at state level and national level in India.

Reducing the prevalence of smoked tobacco use might be due to the smoking cessation program and high taxation for it. The higher rate of the decreasing trend of any tobacco use and smoked tobacco use during 2007 and 2013 might be due to the impact of the MPOWER package that was initiated in 2007 in Nepal (Dhimal et al., 2020). Many studies (Anyanwu et al., 2020; Chhabra et al., 2021; Levy et al., 2018; Reddy et al., 2012; Wilson et al., 2012) have shown significant role of anti-tobacco policies to reduce the prevalence of tobacco use. Misconceptions such as taking SLT as alternative to smoked tobacco and considering it as less harmful than smoked tobacco, and smoking cessation-focused program might be regarded for the consistency of SLT and its slight increase during 2013 to 2019. Besides, consumption of SLT is more common in Terai that is slowly and steadily reaching to whole country, lack of knowledge about harmful effects of SLT, and lack of researches regarding its impacts (National Health Education Information and Communication Center, 2013) might be the reasons for the increase in SLT use. Not only this, tobacco companies are playing significant role to increase SLT users in the South-East Asia by conveying misdirected advertisements (Suliankatchi et al., 2017).

This review study shows that any tobacco use and smoked tobacco use decreased among men and women while SLT use slightly increased among men and women from 2007 to 2019. Proportion of men who used any tobacco and smoked tobacco had decreased between 2007 and 2013, but it increased during 2013 and 2019. Study conducted among people of age 15 years and above in China found that current smoking among men and women stepped down to 51.6% from 60.6% and to 2.9% from 4%, respectively, from 1991 to 2011 (Li et al., 2016), which are in line of the findings of this review study. The prevalence of any tobacco (Abdulkader et al., 2019) and smoked tobacco (Abdulkader et al., 2019; Khanal & Khatri, 2021; Shrestha et al., 2019) among men and women was in the declining trend and, the prevalence of SLT use was in upward trend (Khanal & Khatri, 2021; Shrestha et al., 2019); but the prevalence of SLT use among women was in slightly moving up (Abdulkader et al., 2019) that are in line with the findings of this review study. The prevalence of any tobacco use was steady among men and women, however, it was constant among women (Shrestha et al., 2019). The prevalence of any tobacco use among men was constant (Khanal & Khatri, 2021) which is different from the findings of this review. Likewise, the prevalence of SLT use among men was in downward

trend while it was in modest downward trend among women (Shrestha et al., 2019) that is different from the findings of this review.

This review study found that, compared to women, proportion of men who use any tobacco, smoked tobacco, and SLT was many times higher during 2013 and 2019, which is similar to many studies (Chhabra et al., 2021; Chockalingam et al., 2014; Khanal & Khatri, 2021; Yang et al., 2019). However, Patten et al. (2019) reported that proportion of female who consume SLT and any tobacco was more than male, but, it was opposite in case of smoking. Tobacco use is seen higher among men due to patriarchal structure of our society where women are dependent on their counterparts and they are not as free and open like men. Not only this, our culture has prohibited women to enjoy tobacco like men, and tobacco use among men and women is dependent on religion in many countries including Nepal (Sreeramareddy et al., 2014), and patriarchal society and feeling of masculinity result less tobacco use among women than men use (Nepal Development Research Institute, 2020).

The findings of STEPS Surveys indicate that the prevalence of any tobacco use increased along with the age, higher in the upper age group than lower age group. The prevalence of any smoked tobacco and SLT increased as age group increased except age group 55-64 years in 2007 and 55-69 years in 2019 where the prevalence of SLT use was lower than preceding age group. A review study conducted by Chhabra et al. (2021) also highlighted that as age group increased, consumption of tobacco increased, and it was more in age group 45 years and above than age group 24-44 years, and was less in age group below 24 years. Panda et al. (2012) found that the prevalence of tobacco use in age group 31 to 40 years, 41 to 50 years, and more than 50 years was 47.2%, 55.1%, and 60.6%, respectively. Shrestha et al. (2019) claimed the age as a significant predictor of tobacco use and reported that age group other than 15-19 years, had higher odd of using any tobacco. Khanal and Khatri (2021) found that the prevalence of tobacco use among men of age group 45-49 years was five times higher than age group 15-19 years had, and it was two times higher in age group 45-69 years than age group 15-29 years had. The higher prevalence of tobacco use in upper age groups mirrors the traditional thought of society where adult are more free than younger, hence, tobacco use is preferable for them rather than younger children. They had become habituated due to longer experience of tobacco use (Lakew & Haile, 2015), therefore, they could not easily leave it that result engagement of higher number of older adults in tobacco use.

This review study shows that, overall, age of initiation of tobacco use among people decreased from 2007 to 2019 while it increased among women and decreased among men. A study from China also shows that among people who were 18 years old or above and borne during 1950 to 1997, mean age of initiation of smoking was declined to 17.5 years from 22 years (Pan et al., 2020). But, Global Adult Tobacco Survey (GATS) 2016/17 reported that the age of initiation of tobacco use was in increasing trend (as cited in Chhabra et al., 2021) that is opposite to this review study. A study partially supports the findings of this study, which mentioned that for men and women, age of initiation of smoking reduced to 21.4 from 21.9 years and to 28.4 from 31.4 years, respectively (Li et al., 2016). Unlike the findings of this study, a study conducted in Australia among age group 18 to 21 years old found that age of initiation of smoking increased to 16.3 years in 2016 from 14.4 years in 2001 (Livingston et al., 2020). Imitation of elders and modernization of society might be the most effective

interpretation for declining age of initiation of tobacco use because early and middle adolescents are in more risk of being engaged in tobacco use (Pradhan et al., 2013).

This study did not apply strong statistical tool except percentage; and did not include education level, wealth quintile, ethnicity, religion, and place of resident of participants; the types of smoked tobacco and SLT to describe the trend of tobacco use. Despite these limitations, this study evokes to include contents regarding SLT in health education and tobacco cessation program that might contribute to reduce prevalence of its consumption among students and promote health and educational achievement of them.

Conclusion

In conclusion, although the prevalence of tobacco use was in the declining trend from 2007 to 2019 in Nepal, SLT use separately among men and among women was slightly in the increasing trend. The prevalence of tobacco use was high among men and people from upper age group. Although reducing trend of tobacco use was higher during 2007 to 2013 than 2013 to 2019, SLT use was in increasing trend. Moreover, the mean age of initiation of tobacco use was in the decreasing trend from 2007 to 2019. This is a challenging situation for Nepal. In order to address why SLT use increased among men and women, and what the contributing factors are to be investigated. The government should, therefore, conduct SLT specific cessation program for men and people from higher age group to minimize its use.

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