

IMPACTS OF CIGARETTES AND E-CIGARETTES DUAL USAGE ON PSYCHOLOGICAL WELL-BEING, HEALTH, AND SMOKING CESSATION: PROPOSED FRAMEWORK

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Abstract:

The purpose of this study is to propose a conceptual framework that identifies the potential factors that influence smoking cessation and the psychological well-being of students at university levels. The proposed framework for this study is established based on the social epidemiology theory, which attributes the surrounding environment to a set of habits that affect health stability. In line with the previous studies that investigated the influence of nicotine dependency of students, smoking practices of students, and students' perception of health effects on health, this study recommended a conceptual framework that combines these three factors which are nicotine dependency of students, smoking practices of students, and student's perception of health effects, to identify their impact on smoking cessation and psychological well-being, besides the potential moderation effect of socio-demographic factors such as, gender, ethnicity, income level.

Keywords: Nicotine dependency, smoking practices, perception of health effects, smoking cessation, psychological well-being

1.1 Introduction

Electronic Nicotine Delivery Systems (ENDS), including electronic cigarettes, also referred to as "e-cigarettes" or "vapes," have become popular in recent years. An e-cigarette is an electronic device that uses the battery's electricity to deliver flavored liquid in the form of vapor into the body. The number of people who use e-cigarettes has risen quickly in some developed countries such as USA and UK (Raju, 2021). Nicotine and other components are aerosolized before inhalation in e-cigarettes rather than being burned. While the lack of combustion decreases toxicant exposure for e-cigarette users compared to conventional cigarettes (Callahan-Lyon, 2014; Robert Lourdes et al., 2019), inhalation poses risks. Existing tobacco smokers have used e-cigarettes in various ways and for various reasons (Kalkhoran et al., 2015).

Since the advent of e-cigarettes in 2007, their popularity and interest in their use have been increasing worldwide, which provides an alternative smoking tool for smokers. As a

result, many conventional smokers either shift to e-cigarettes or become dual users of both types of smoking. Two possible reasons for dual-use are consumers' perceptions of these products as safer than cigarettes (Goniewicz et al., 2013) and the belief that these products aid in smoking cessation (Etter, 2010). Dual users of smokeless tobacco and cigarettes have a higher risk of myocardial infarction than cigarette users alone (Teo et al., 2006). While some argue that promoting smokeless tobacco products as safer alternatives to cigarettes would reduce health risks at a population level, others say this is unlikely (Mejia et al., 2010). Furthermore, the dual use of smokeless tobacco and cigarettes may encourage some smokers to put off quitting, and dual users are less likely to quit than smokers who only smoke cigarettes (Berkowitz, 2006; Wetter et al., 2006). Even though users perceive e-cigarettes as less harmful than cigarettes, helpful for reducing cigarette consumption, and beneficial for smoking cessation, various longitudinal studies have found that using e-cigarettes does not help people quit smoking (Kalkhoran et al., 2015).

In order to effectively educate and counsel people who are using multiple tobacco products, it is important to identify the factors that contribute to concurrent use. In developed countries, e-cigarette use increased from an estimated 2.3 million users in 2013 to 5.1 million users in 2015, with global sales increasing from \$685 million in 2009 to \$8.4 billion in 2015. E-cigarette use is on the rise, which has sparked debate among public health advocates. Some people suggest e-cigarettes are riskier than traditional cigarettes, while others disagree (Ganasegeran and Rashid, 2016). Although e-cigarette vapor is less harmful than cigarette smoke, experimental models show that it affects the pulmonary endothelium (Wang et al., 2018). Exposure to air pollutants and particles damages the pulmonary endothelium, which can lead to chronic asthma or Chronic Obstructive Pulmonary Disease (COPD) (Kouzouna et al., 2016; Binns et al., 2018).

The main reasons for using e-cigarettes were to help the user quit smoking tobacco cigarettes, the perception that e-cigarettes are less intrusive than tobacco cigarettes, and the ability to use them in public places (Raju & Phung, 2020). The belief is that e-cigarettes are less harmful than traditional cigarettes and cost less than tobacco cigarettes. According to several previous studies such as Wong, Shakir, Alias, Aghamohammadi, and Hoe (2016), Goh, Dujaili, Blebil, and Ahmed (2017), and Jankowski et al. (2020), most e-cigarette smokers were university students, young professionals, and managers.

This study proposes a framework that illustrates the impact of cigarettes and e-cigarettes dual usage on psychological well-being, health, and smoking cessation. For this purpose, the first section will explain the theoretical framework related to the factors used in this study. The proposed factors are discussed in a separate section with a subsection specified for each factor. The proposed relationships are illustrated in a framework diagram. A conclusion will be included at the end of this paper.

1.2 Theoretical discussion

A theoretical model to explain the causes or determining factors of inequalities in health was developed, which served as the basis for preparing its recommendations on strategies to

reduce inequalities in health. The model distinguishes between structural and intermediate determinants of health inequalities (Wang et al., 2018). Among the structural determinants is the socio-economic and political context, which refers to the factors that significantly affect social stratification and the distribution of power and resources within it.

Studies that aim to analyze the relationship between the political context and public health and health inequalities have shown that countries with a social-democratic tradition promote a more extensive welfare state, with fewer income inequalities and full employment policies (Robert Lourdes et al., 2019). However, the influence of politics and the welfare state on the health of the population and health inequalities is not so evident, although some studies have described better results in some health indicators, such as infant mortality, and lower perceived health inequalities according to social class in countries with a more developed welfare state.

The different axes of inequality, such as social class, gender, age, ethnicity, race, and territory of origin or residence, determine hierarchies of power in a society that affect the opportunities to have good health through exposure to so-called "intermediate determinants." These factors include, first of all, material resources, such as employment conditions (employment situation, precariousness) and work (physical and ergonomic risks, organization and psychosocial environment); the burden of unpaid housework and care of people; the level of income and the economic and patrimonial situation; the quality of the home and its facilities; and the neighborhood or area of residence and its characteristics (Mason, Wheeler, & Brown, 2015). Together with the position of power, these resources have an impact on health and influence psychosocial processes such as lack of control, self-realization, stressful situations, and behaviors that influence health (Raju, 2021). Finally, although health services are not the main factor generating health inequalities, they can affect them, especially if access and quality to them are not equitable for the entire population.

There are two main theories about social classes, which start with Karl Marx and Max Weber. According to Marxism, social classes are defined by the relationship of individuals with

the means of production, thereby distinguishing between the working class, capitalists, and bourgeois, which give rise to relations of exploitation that generate antagonistic interests between them (Carreras et al., 2021). The Weberian approach, for its part, defines classes according to the position of people in the labor market and associated attributes such as income, possession of goods, and other resources (Becher, Belau, Winkler, & Aigner, 2018).

Several studies have been conducted on e-cigarette smoking in Malaysia to explore the reasons for use (Wong et al., 2016), its effectiveness and safety (Rahman et al., 2016), and factors associated with its usage among Malaysian adolescents (Robert Lourdes et al., 2019). However, there is a lack of empirical knowledge on the health risks and impacts of dual usage of cigarettes and e-cigarettes on Malaysians' young generation psychological well-being and smoking cessation (Carreras et al., 2019). Therefore, this research aims to model the health risk and measure the impacts of dual usage of cigarettes and e-cigarettes on psychological well-being and smoking cessation (Raju, 2021).

The potential health risks arising from the dual usage of conventional tobacco and e-cigarettes have received little attention in Malaysia, despite the possibility of being more harmful to health. Therefore, this research will provide information on the self-reported impacts of dual usage on the psychological well-being of university students who have been reported to engage in the dual usage of these products. This research will identify implications and serve as a baseline study for future research regarding the dual usage of tobacco and e-cigarettes in Malaysia.

1.3 Dual smoking and the health effect

Dual smoking is a compound of two types of smoking habits: traditional smoking, which consists of tobacco, and vaping smoking, which consists of liquidized tobacco. Dual smoking exposure produces a variety of harmful health impacts, including coronary heart disease and lung cancer (Carreras et al., 2019). There is presently no established safe level of exposure to dual smoking, which is responsible for a significant portion of death, sickness, and

disability. Because dual smoking exposure raises health expenditures, lowering exposure might be beneficial to health and the economy (Raju, 2018) (Becher, Belau, Winkler, & Aigner, 2018).

Borland et al. (2019) investigated whether a modest combination of smoking and vaping levels yields a suitable typology for describing smoking and vaping habits. A cross-sectional data from adults (18 years) in the United States ($n = 2291$), England ($n = 3591$), Australia ($n = 1376$) and Canada ($n = 2784$) were utilized. Participants who smoked, vaped, or used both products at least once a month were involved in the study and were separated into eight groups based on how often they used each product (daily, non-daily, no current use). Consequently, four parallel usage groups emerged (concurrent non-daily users, dual daily users, predominant smokers, and predominant vapers). The groups were compared on socio-demographics, attitudes, nicotine dependency, beliefs regarding the two products, and quit-related variables with data weighted to reference population surveys in each nation (Raju, 2021). Simultaneous daily nicotine users had greater nicotine dependency indicators and more favorable views about smoking and vaping than concurrent non-daily nicotine users.

Hungarian adult e-cigarette-only users (former smokers who transitioned totally to e-cigarette usage) and dual users exhibited self-reported adverse events. They perceived health changes as a result of e-cigarette usage, according to Abaflavi et al. (2019) (smokers who use e-cigarettes and combustible tobacco cigarettes concurrently). They found that dual users (17.6%) were substantially more likely to report vaping-related side effects than e-cigarette-only users (26.2 percent vs 11.8 percent, $p < 0.05$). E-cigarette-only users were more likely to experience health gains than dual users for all physiological functions examined.

Shan et al. (2020) investigated high school students' psychological well-being and dual-use of cigarettes and e-cigarettes. They concluded that dual-users showed worse psychological well-being, albeit there were differences amongst subgroups of dual-users. This points to the importance of dual usage concerning psychological well-being. Worrisome facts about the health effects and epidemiology of traditional cigarette smoking are quite explicit

(Cooper et al., 2017). Recent evidence suggests that e-cigarette use may be harmful to young adults (Geidd and Rapoport, 2010; England et al., 2015; Cooper et al., 2016).

1.4 Dual tobacco use and e-cigarette use drivers

1. Lack of combustion decreases toxicity

Dual users add another tobacco product, e.g., e-cigarettes, based on the belief that lack of combustion decreases toxicant exposure compared to conventional cigarettes (Callahan-Lyon, 2014; Lourdes et al., 2019). Wang et al. (2018) also noted that the significant barrier to quitting smoking is the addictiveness of nicotine and the withdrawal syndrome. It also stated that e-cigarettes deliver a lower plasma nicotine level, but not enough justification to use them as an alternative. When smokers try to quit due to the addictiveness of nicotine, an after-effect known as withdrawal syndrome sets in (Raju, 2018). Quitters need counselling and advice, and some doctors recommend nicotine replacement therapy as an alternative.

2. Tobacco use as a weight-loss strategy (Pénzes et al., 2012)

Based on the bivariate model used by Penzes et al. (2012), factors that showed significant association with the belief that smoking aids in weight control include perceived body shape, smoking friends, gender, and grade. This belief is much stronger amongst females and is a significant reason youths get involved in smoking. This is also another contributing factor to increased tobacco smoking. The present study's scope is limited to nicotine dependency, propensity to quit, social demographic characteristics, psychological well-being, and the health effects of smoking.

3. Health Risk Perception and Psychological Well-Being

According to research, young people typically understand that smoking is harmful to their health. Still, they underrate their own individual risk, frequently due to misunderstanding the severity of tobacco-related diseases or a view

that their risk is less than their counterparts (Weinstein et al., 2010; Shepperd et al., 2013). The relative damage due to various tobacco products and diverse tobacco use patterns is less understood among teenagers. Adolescents believe that the harm produced by tobacco use is on a scale (Amrose et al., 2014).

1.5 Proposed framework

One of the rationales for this study is to examine the association between smoking and nicotine dependency for both single and dual users using online questionnaires. Studies have shown the dual usage of tobacco and e-cigarettes among university students in Malaysia and the increased nicotine dependence resulting from e-cigarettes (Puteh et al. 2018, Martinez et al. 2019). According to a survey of college students, only 12% of e-cigarette consumers have never attempted to smoke a traditional cigarette before (Sutfin et al., 2013). Most young smokers are involved in both conventional and e-cigarette use. It is critical to identify aspects linked to the concurrent use of both and effectively educate and advise people who use numerous tobacco products since incentives for usage can impact smoking cessation behavior. A study by Puteh et al. (2018) among university students in Malaysia on cigarettes and e-cigarettes shows that 40.3% of the respondents are dual users and a larger percentage smoke e-cigarette. Martinez et al. (2019) found that dual usage reduces the number of combustible cigarettes consumed but increases overall nicotine consumption and dependency. When nicotine dependence increases, it becomes very difficult to quit smoking.

Perception of the health risk of smoking is key to smoking cessation. Due to this belief, young people underrate their risk. Alton et al. (2018) noted that smokers who perceive smoking as dangerous in all domains are more likely to quit smoking.

Some dual users vape to quit smoking, and only a few have succeeded. Therefore, there is a need to examine the characteristic behaviors of e-cigarette and dual users through a qualitative study (Brandon et al., 2019).

Based on the discussion above, this is a non-experimental study in which the researcher determines the statistical relationship between

two variables. The approach to this study is through a quantitative assessment to establish a statistical relationship between variables of

interest. Figure 1 illustrates the concept of this study.

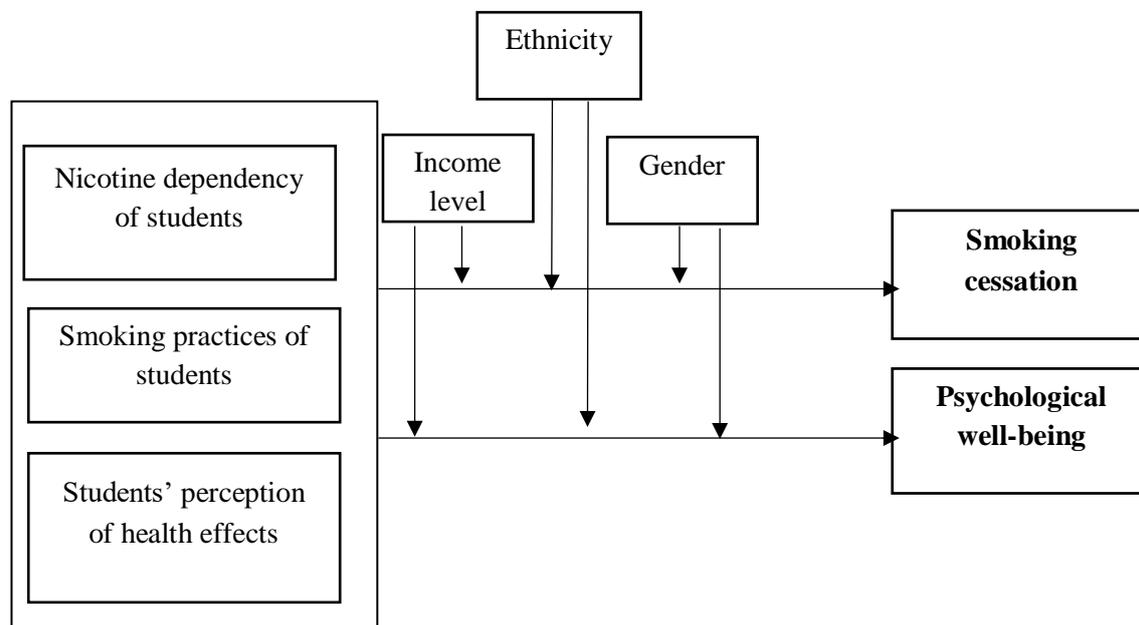


Figure 1: Proposed conceptual framework

1.6 Conclusion

When comparing heavy smokers (those who smoked ten cigarettes or more per day) to non-smokers, a study found that heavy smokers (those who smoked ten cigarettes or more per day) reported significantly lower well-being, symptom burden, and functional disability (Wamamili et al., 2021). Grant et al. (2019) looked into the prevalence of e-cigarette (vaping) use among university students, as well as its links to psychosocial factors such as mental health issues, impulsivity, and illicit drug use.

Based on the previous studies that investigated the relationship between cigarettes and e-cigarettes dual usage on the psychological well-being, health, and smoking cessation, this study proposed a conceptual framework that constructs three factors, which are nicotine dependency of students, smoking practices of students, student's perception of health effects to identify their impact on smoking cessation and psychological well-being, besides the potential moderation effect of socio-demographic factors such as gender, ethnicity, and income level.

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