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The Mental Health Status of E-Cigarette Users in Hulu Langat District, Selangor

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ABSTRACT

This study explores the mental health status of e-cigarette users and associated factors, emphasising the importance of ethical marketing for sustainable mental wellness. A cross-sectional study was conducted among 303 Malaysian e-cigarette users in Hulu Langat District, Selangor, using the DASS-21 questionnaire to measure depression, anxiety, and stress. Multivariate logistic regression was applied to analyse associated factors. Prevalence rates for depression, anxiety, and stress were 11.9%, 21.5%, and 10.6%, respectively. Factors associated with mental health outcomes included experimentation, withdrawal symptoms, exposure to promotions, and beliefs about e-cigarettes' efficacy in smoking cessation. E-cigarette users experience varying levels of psychological distress. Addressing withdrawal symptoms and promoting ethical marketing practices are crucial for reducing mental health issues and contributing to sustainable community mental health.

Keywords: Anxiety, depression, e-cigarettes, mental health, stress, tobacco

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INTRODUCTION

The prevalence of e-cigarette use among smokers has increased rapidly, with 38.5% of Malaysian daily smokers reporting ever-use in 2019 (Ab Rahman et al., 2019). This trend suggests a misconception about e-cigarettes as an effective smoking cessation aid. Studies show that, on average,

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using e-cigarettes for cessation did not improve successful quitting or prevent relapse. The rapid growth and the increasing prevalence of use indicate potentially misleading marketing strategies. E-cigarettes are often framed as alternatives to combustible cigarettes, with advertisements placed in retail outlets and across various media channels (Collins et al., 2019).

While studies have shown strong associations between conventional cigarette smoking and mental health issues, the psychological impacts of e-cigarette use remain largely unexplored. Recent research suggests that e-cigarette use is associated with depression, suicidal ideation, and suicide attempts (Fluharty et al., 2017).

This study aims to assess the mental health status of e-cigarette users in Hulu Langat District, Selangor, examining the prevalence of mental health issues, associated factors, and potential correlations between e-cigarette usage and mental well-being. By investigating socioeconomic status, e-cigarette use patterns, and coping strategies, this study seeks to provide evidence on the relationship between e-cigarette use and mental health disorders in Malaysia.

MATERIALS AND METHODS

The cross-sectional study involved a quantitative survey of 303 Malaysian e-cigarette users aged 18 and above. The participants were recruited through non-probability convenience sampling in Hulu Langat District, Selangor, using a validated self-reported questionnaire. The study collected data on depression, anxiety, and stress levels using the Depression, Anxiety, and Stress Scale 21 (DASS-21) Questionnaire, alongside socioeconomic status, e-cigarette use patterns, and coping strategies of e-cigarette users. Data were analysed using descriptive and inferential statistics to present the prevalence of depression, anxiety, and stress among e-cigarette users while analysing its associated factors. Multivariate logistic regression was performed on potential confounders.

RESULTS AND DISCUSSION

Out of the 303 participants of the study, the majority were male (88.4%), Malay (80.2%), above 30 years old (58.1%), single (65.7%), income level below RM5000 (51.5%), and attained a bachelor's degree in education level (41.3%). The prevalence rates of depression, anxiety, and stress among the participants from this study were 11.9%, 21.5%, and 10.6%, respectively. The final multivariate regression model indicated that individuals who smoke e-cigarettes experiment Adjusted Odds Ratio (AOR) 0.335, 95% Confidence Interval (CI) 0.118,0.947, p-value <0.05), individuals experiencing sleepiness (AOR 3.230, 95% CI 1.107, 9.422, p-value <0.05) and frustration during withdrawal (AOR 3.137, 95% CI 0.971, 10.133 p-value <0.05), individuals using a quitline (AOR 17.076, 95% CI 1.418, 205.606, p-value <0.05), individuals exposed to e-cigarette promotions on the internet

(AOR 2.649, 95% CI 1.073, 6.536, *p*-value <0.05), and individuals who believe e-cigarettes help to quit smoking (AOR 0.391, 95% CI 0.168, 0.909, *p*-value <0.05) were associated with depression.

Additionally, individuals experiencing withdrawal symptoms during periods of non-e-cigarette use (AOR 5.793, 95% CI 1.549, 21.66, *p*-value <0.05) and nicotine replacement therapy as an intervention to quit smoking (AOR 23.147, 95% CI 1.357, 394.889, *p*-value <0.05) were associated with anxiety. Finally, individuals starting e-cigarette use after 20 years of age (AOR 4.203, 95% CI 0.844, 20.922, *p*-value <0.05), individuals using e-cigarettes to experiment (AOR 0.552, 95% CI 0.179, 1.703, *p*-value <0.05), individuals experiencing depressed mood (AOR 4.213, 95% CI 1.392, 12.752, *p*-value <0.05), sleepiness (AOR 3.529, 95% CI 1.079, 11.538, *p*-value <0.05), and frustration during withdrawal (AOR 4.912, 95% CI 1.385, 17.414, *p*-value <0.05), individuals using a Quitline (AOR 42.033, 95% CI 2.584, 683.641, *p*-value <0.05), and praying or meditating (AOR 0.125, 95% CI 0.019, 0.804, *p*-value <0.05) were associated with stress.

The study revealed that most e-cigarette users utilise products containing nicotine (89.1%). It was also observed that participants were intrigued by the idea of trying e-cigarettes (42.6%), and most participants held the belief that e-cigarettes aid in smoking cessation (70.6%), thus perpetuating a cycle of dependence on them. This cycle is likely to have psychological ramifications. Furthermore, due to participants having a low level of knowledge of the hazards associated with e-cigarettes (47.2%), there is a pressing need for increased efforts to educate the public about the risks linked to utilising e-cigarettes. It emphasises the importance of raising public awareness about the risks associated with e-cigarettes.

Additionally, it was observed that withdrawal symptoms have consistently emerged as a significant factor associated with adverse mental health outcomes, including depression, anxiety, and stress, among e-cigarette users. Regular use of nicotine leads to dependence, and when e-cigarette users attempt to reduce or quit, they experience withdrawal symptoms due to the sudden lack of nicotine stimulation. This study found that withdrawal symptoms, such as sleepiness and frustration, were associated with nearly three times the likelihood of experiencing depression (Adjusted OR = 2.96, $p = 0.032$; Adjusted OR = 3.14, $p = 0.053$). It aligns with previous research suggesting that withdrawal-induced mood disturbances can exacerbate depressive symptoms due to the sudden lack of nicotine, which is often used to regulate mood (Korhonen et al., 2006).

Similarly, the presence of withdrawal symptoms had an even more pronounced association with anxiety, with individuals experiencing these symptoms being almost six times more likely to suffer from anxiety (Adjusted OR = 5.793, $p = 0.009$). This finding is consistent with previous research, which has shown that nicotine withdrawal can lead to significant increases in anxiety symptoms, contributing to the difficulty of smoking cessation (Hughes, 2007).

In terms of stress, the study revealed that symptoms like depressed mood, sleepiness, and frustration during withdrawal were significantly associated with higher stress levels (Adjusted ORs = 4.213, 3.529, and 4.912, respectively, all $p < 0.05$). These results are supported by earlier work showing that withdrawal symptoms can lead to heightened stress as individuals struggle with both the physical and emotional discomfort of quitting, contributing to the difficulty of maintaining smoking cessation (Piasecki et al., 1998). Overall, this underscores the potential dangers of e-cigarettes, as experiencing withdrawal symptoms could lead to dependence, making it challenging for users to break free from this cycle.

CONCLUSION

The study can aid policymakers in the need for stricter regulations on e-cigarette marketing and sales, especially to vulnerable populations like adolescents. Policies can include age restrictions, advertising bans, and warning labels about mental health risks. It is especially useful in the regulation of nicotine content. Policies regulating the nicotine content in e-cigarettes can help mitigate the risk of addiction and its associated mental health impacts.

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