The relationship between attitudes and behavior of e-cigarette smoking among high school students in Thailand

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Abstract

This research aimed to examine the relationship between attitudes and behaviors regarding e-cigarette use among high school students in Samut Songkhram Province, Thailand. The sample comprised 390 high school students from Samut Songkhram Province, selected through stratified random sampling. Data were collected using questionnaires, and the Pearson correlation coefficient was employed to analyze the relationships. The findings indicated that positive attitudes toward e-cigarette use were defined as having an attitude score of 31-40% or higher. Overall, most respondents exhibited a good level of attitude (M = 31.29, SD = 6.04). The behavior of e-cigarette use among the respondents was at a moderate level (M = 27.35, SD = 4.77). Additionally, the attitudes of high school students toward e-cigarette use showed a very weak negative correlation with their e-cigarette use behavior at a statistically significant level of .05 (r = .143). Based on these findings, it is recommended to organize exhibitions or conduct practical workshops to improve knowledge and skills about the health risks and diseases associated with e-cigarette use for high school students.

Keywords: Attitudes, Behavior of e-cigarette smoking, E-cigarette, High school students

1. Introduction

E-cigarettes are harmful to health and cause adverse effects, particularly among adolescents. They represent a new form of electronic tobacco that has spread widely over the past decade (Piyawan Boonpen et al., 2019). Currently, the use of e-cigarettes among youth is on the rise in both North America and Europe. In the United States, the prevalence of e-cigarette use within the past 30 days among high school students increased from 1.5% in 2011 to 20.8% in 2018 (Cullen et al., 2018). In Mexico, the prevalence of e-cigarette use was reported to be as high as 22% among middle school students. Data from the United States indicate that the number of e-cigarette users has doubled every year since 2008. E-cigarettes have gained popularity and are now widely used as a smoking cessation aid, replacing products such as nicotine gum and patches. In Thailand, the prevalence of e-cigarette use among university students was reported to be 22.2% (Daily,2019). Across Europe, it is

estimated that approximately 48.5 million people have tried e-cigarettes at least once, while 7.5 million are current users. The prevalence of e-cigarette use in the European Union continues to rise. The five countries with the highest prevalence of either traditional cigarette or e-cigarette use, along with the average age of first-time use, are Lithuania 56.6%; Poland, 45%; Belarus, 42.7%Slovakia, 42.2%; and Russia, 33.4%. The average age of first-time e-cigarette users is between 16 and 18 years. The rising rate of e-cigarette use across many countries has become a significant global public health issue, particularly among university-age adolescents, a group with sufficient financial means to purchase e-cigarettes. Research has shown that among adolescents preparing to enter university in the United States, the e-cigarette use rate was 11.7% in 2017, rising to 20.8% in 2018 (Gentzke et al., 2019).

A review of the literature on the prevalence of e-cigarette use, as well as the attitudes and behaviors of high school students in both international and Thai contexts, reveals that several factors are associated with e-cigarette use among this group. These factors include internal personal characteristics and external environmental influences, such as age, gender, education, stress, and overall health status (Adzrago & Fujimoto, 2023). Additionally, school relationships, peer pressure to use e-cigarettes, parental e-cigarette use, and parental smoking of traditional cigarettes are significant contributing factors (Ruenphet, 2023). E-cigarettes often serve as a means for forming social bonds within new adolescent peer groups, facilitating experimentation and the exchange of new behaviors. Various motivations, such as curiosity, reluctance to refuse peer offers, politeness toward friends, and the desire for social acceptance, play a crucial role in encouraging e-cigarette use. These factors can lead to inappropriate behaviors among students, which may negatively affect their well-being and potentially escalate to the use of other addictive substances (Siladlao et al., 2024). When adolescents develop a preference for e-cigarettes and use them more frequently, it can result in addiction. This addiction adversely affects their health and the health of those around them, leading to various diseases (Thongsutt et al., 2023).

Based on the reasons above, the researcher recognizes the significance of this issue and is therefore interested in studying the attitudes and behaviors related to e-cigarette use among high school students in Samut Songkhram Province. The data obtained from this study will serve as a guideline for addressing attitudes and behaviors in future groups of students who represent a vital force in the country's development. Ultimately, this will benefit the students and help nurture them into becoming responsible and productive youth for the future.

1.1 Research Objective

To study the relationship between attitudes and behaviors regarding e-cigarette use among high school students in Samut Songkhram Province, Thailand.

2. Methods

Study Design and Population

This descriptive cross-sectional study examined the relationship between attitudes and behaviors regarding e-cigarette use among high school students in Samut Songkhram Province. Data were collected via an online questionnaire given from June to September 2024.

The study's population consisted of senior high school students in Samut Songkhram Province, Thailand, selected from five schools within the province. To determine the sample

size, a G*Power analysis was conducted at a significance level of 0.05 with a medium effect size, which resulted in a total of 390 students.

Stratified random sampling was used to choose the study participants. Each school was considered a stratum. The number of participants for each stratum was determined proportionately by the number of students in each school. Then, simple random sampling was performed in each stratum using a random number table. Inclusion Criteria comprised 1) adolescents currently enrolled in high school in Samut Songkhram Province, 2) those given parental consent to participate in the research, and 3) those who provided willingness and cooperation with the researcher. Exclusion Criteria included 1) adolescents with a chronic illness requiring ongoing medication prescribed by a doctor and 2) those with a history of schizophrenia or other psychotic disorders.

The research instrument was a questionnaire divided into two parts as follows:

Part 1: The personal information questionnaire includes general questions about high school students, such as their gender, grade level, religion, parents' marital status, and income level. It consists of five items presented in a multiple-choice format.

Part 2: The questionnaire on attitudes towards smoking e-cigarettes consists of 10 items and is adapted from the questionnaire developed by Kitipong Ruenphet (2021). It is designed as a single-response, multiple-choice questionnaire with the following options: strongly agree, agree, disagree, and strongly disagree. The questions are presented in a rating scale format, including positive and negative statements. Each item is written as a declarative sentence and is evaluated on a 4-point scale using the scoring criteria of the Likert Scale.

Part 3: The questionnaire on e-cigarette smoking behavior consists of 10 items, adapted from the questionnaire developed by Kitipong Ruenphet (2021). It is a single-response, multiple-choice questionnaire with the options: strongly agree, agree, disagree, and strongly disagree. Respondents are instructed to select the best option for their opinions or feelings. Scores range from 10 to 40 points, with specific scoring criteria. The questions are structured in a rating scale format and include both positive and negative statements.

Ethical Considerations: This study received ethical approval from the Research and Development Institute, Suan Sunandha Rajabhat University (COA.1-034/2024)

Statistical analysis: Statistical analyses were conducted using SPSS (SPSS Inc., Chicago, IL, USA) software for Windows. Descriptive statistics were used to analyze the general information of the sample: frequency, percentage, median, arithmetic mean (M), and standard deviation (S.D.). Pearson correlation coefficient (r) was used to analyze the relationships between attitudes and behavior of e-cigarette smoking among senior high school students. For statistical tests, the significance level was set at 0.05.

3. Results

A study on the attitudes and behaviors toward e-cigarette smoking among high school students in Samut Songkhram Province revealed the following findings: The sample consisted of 390 high school students (55.9%). Most were female (47.4%) and in Grade 10 (97.9%). Most identified as Buddhist (63.1%), lived with both parents and reported having sufficient income with savings (74.1%).

The data on attitudes toward e-cigarette smoking revealed that a positive attitude was defined as an attitude score of 31-40% or higher. The findings indicated that most respondents exhibited a positive attitude (M = 31.29, SD = 6.04). When analyzed by specific aspects, attitudes toward e-cigarette smoking were also found to be positive in the following areas: knowledge and understanding (M = 3.13, SD = 0.62), feelings (M = 3.17, SD = 0.73), and practices (M = 3.04, SD = 0.78).

The data on e-cigarette smoking behaviors revealed that, on average, the behavior was at a moderate level (M = 27.35, SD = 4.77).

The analysis of the relationship between attitudes and e-cigarette smoking behavior among high school students in Samut Songkhram Province revealed a very weak negative correlation between students' attitudes toward e-cigarette smoking and their smoking behavior, which was statistically significant at the .05 level (r = .143).

Discussion

The study found that, overall, the sample group had a positive attitude toward e-cigarette smoking. This was because the participants had studied and researched information about e-cigarettes through various channels, which allowed them to gain a sufficient understanding of the health risks associated with e-cigarettes. They could ask questions and engage in discussions to deepen their knowledge, achieving a high level of understanding. Additionally, the participants could apply the knowledge they gained in their daily lives correctly and appropriately. This finding contrasts with the study by Arak Mungmai (2021), which analyzed the relationship between exposure to information, awareness, attitudes, and the tendency to engage in e-cigarette smoking behavior among high school students. The study found that the average attitude score regarding e-cigarettes among high school students was moderate. When examining specific aspects of attitudes, the top four opinions were as follows: first, "I think smoking e-cigarettes makes one more accepted"; second, "I think smoking e-cigarettes makes it easier to socialize"; third, "I enjoy smoking e-cigarettes because they do not contain substances that cause cancer"; and fourth, "I am comfortable with people who smoke e-cigarettes.

The study found that, overall, the sample group exhibited moderate levels of e-cigarette smoking behavior. This was attributed to issues such as sleep problems, decreased concentration, irritability, boredom, and a tendency to avoid social interactions, which led participants to feel the urge to smoke e-cigarettes whenever they had free time. This finding contrasts with the study by Somdet Phimayakul and Kanokwan Khosi (2023), which analyzed attitudes and behaviors toward e-cigarette consumption and prevention strategies among students at Chiang Mai Rajabhat University. Their study found that e-cigarette consumption behavior among the students was low, as they were highly aware of the dangers associated with e-cigarettes.

The relationship between attitudes toward e-cigarette smoking and e-cigarette smoking behavior showed a positive correlation at the .05 significance level. This result can be attributed to the sample group's varying levels of knowledge and attitudes in interpreting the information they received, which led to different accumulated experiences that influenced individuals' behavior. Consequently, the participants' attitudes affected their e-cigarette smoking behavior. This finding aligns with the study by Natthaphon Rungroj-Sittichai (2017), which analyzed perceptions, attitudes, and behaviors toward e-cigarettes. The study found that overall attitudes were correlated with behaviors related to nicotine concentration levels and

the frequency of smoking. Additionally, both health-related and legal attitudes were found to be correlated.

4. Conclusion

Based on the research findings, it is recommended to organize exhibitions and workshops to educate students about the health risks and diseases associated with e-cigarette smoking. Additionally, awareness-raising activities should be conducted to inform students about the harms and negative health impacts of e-cigarette use.

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References

Adzrago, D., Fujimoto, K., Harrell, M. B., Jones, A., & Wilkerson, J. M. (2022). Association between e-cigarette use behaviors and perceived harmfulness of e-cigarettes and anxiety/depression symptoms among Black/African American Adults. *Preventive medicine reports*, *31*, 102080. https://doi.org/10.1016/j.pmedr.2022.102080

Arak Mungmai. (2021). The relationship between media exposure, perceptions, attitudes, and behavioral tendencies toward e-cigarette use among high school students [Unpublished master's thesis]. Chulalongkorn University.

Cullen, K. A., Ambrose, B. K., Gentzke, A. S., Apelberg, B. J., Jamal, A., & King, B. A. (2018). Notes from the Field: Use of Electronic Cigarettes and Any Tobacco Product Among Middle and High School Students - United States, 2011-2018. *MMWR. Morbidity and mortality weekly report*, *67*(45), 1276–1277. https://doi.org/10.15585/mmwr.mm6745a5

Gentzke, A. S., Creamer, M., Cullen, K. A., Ambrose, B. K., Willis, G., Jamal, A., & King, B. (2019). Vital Signs: Tobacco Product Use Among Middle and High School Students – United States, 2011-2018. *MMWR. Morbidity and mortality weekly report*, *68*(6), 157–164. https://doi.org/10.15585/mmwr.mm6806e1

Kitipong Ruenphet. (2021). Factors related to e-cigarette use among male vocational students in Buriram Province [Unpublished master's thesis]. Burapha University.

Phimayakul, S., & Khosi, K. (2023). Attitudes and behaviors toward e-cigarette consumption and prevention strategies among students at Chiang Mai Rajabhat University. [Unpublished study].

Rungroj-Sittichai, N. (2017). Perceptions, attitudes, and behaviors toward e-cigarettes. [Unpublished master's thesis]. Thammasat University.

Science Daily. (2019). *E-cigarette use linked to successful attempts to quit smoking*. Retrieved from https://www.sciencedaily.com/releases/2016/09/160916103436.htm

Siladlao, S., Rojanabenjakun, P., Songsin, N., Panrinsaen, R., Jummaree, T., Chusuton, S., Sawetsenee, K., Khonraengdee, P., & Mekwimon, W. (2024). Factors Related to Health Literacy in the Prevention of COVID-19 Disease in the Elderly in Lad Yai Subdistrict, Mueang District, and Samut Songkhram Province. International Journal of Geoinformatics, 20(3), 74–80. https://doi.org/10.52939/ijg.v20i3.3137

Thongsutt, T., Yusote, C., Jubprang, S., Sasisuwan, A., Poonchuay, N., Chanawong, A., Sottiyotin,T., Laopaiboonkun, S., & Muthanna, F. M. S. (2023). Factors Associated with Knowledge and Attitude towards E-Cigarettes among Undergraduate Students in Thailand: A Cross-Sectional Study. *Asian Pacific Journal of Cancer Prevention: APJCP*, *24*(1), 353–361. https://doi.org/10.31557/APJCP.2023.24.1.353