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DOES A SINGLE HEALTH TALK MATTER? INSIGHTS FROM A STUDY ON SMOKING AND VAPING AWARENESS AMONG VOCATIONAL STUDENT

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Abstract:

Tobacco use remains one of the leading causes of preventable disease and death worldwide, while the growing popularity of e-cigarettes among adolescents poses new challenges for tobacco control in Malaysia. Vocational college students represent a high-risk subgroup with unique social and environmental influences, yet local evidence on targeted educational interventions for this population remains limited. This study evaluated the effectiveness of a single-session health education programme in improving knowledge and attitudes towards smoking and vaping among 190 Form 4 students at a vocational college in Sepang, Selangor. A structured questionnaire was used to assess students' knowledge and attitudes before and after a health talk. Descriptive statistics, the Wilcoxon Signed-Rank Test, and Spearman's rank-order correlation were used for data analysis. The results showed no statistically significant difference in overall knowledge scores ($Z = -0.527$, $p = 0.598$) or attitude scores ($Z = -1.027$, $p = 0.304$) between pre- and post-intervention. However, item-level findings indicated improvements in correcting misconceptions about the harms of e-cigarettes. No significant correlation was found between knowledge and attitudes at either time point. In conclusion, although the single-session programme did not yield significant overall changes, it helped clarify specific misconceptions, suggesting that multi-session, interactive approaches and community support may strengthen future tobacco prevention efforts among vocational college students in Malaysia.

Keywords:

Smoking, Vaping, Student, Health Talk, Tobacco

Introduction

Tobacco use continues to be one of the leading causes of preventable disease and premature death worldwide, accounting for more than eight million deaths annually (World Health Organisation, 2012). Despite decades of public health efforts and comprehensive tobacco control policies, smoking prevalence remains high in many low- and middle-income countries, including Malaysia. Alarming, the past decade has witnessed the emergence of new forms of nicotine consumption, particularly electronic cigarettes (e-cigarettes or vaping), which have rapidly gained popularity among adolescents and young adults (Fauzi & Areesantichai, 2022; Zoccai et al., 2020).

Recent surveys indicate that while conventional cigarette smoking among Malaysian adults has declined modestly, the uptake of e-cigarettes among youths is increasing. This trend raises concerns about nicotine dependence, dual product use, and relapse among ex-smokers (Ab Rahman et al., 2018; Driezen et al., 2022). A nationwide study reported that approximately 10% of Malaysian teenagers had tried vaping, with curiosity, peer influence, and misconceptions about reduced harm being major drivers (Radzi et al., 2021). The perception that e-cigarettes are a safer alternative persists despite mounting evidence linking vaping to respiratory illnesses, cardiovascular risks, and potential gateway effects leading to conventional cigarette smoking (Ranjit et al., 2021).

Adolescents enrolled in vocational colleges represent a particularly vulnerable subgroup within the youth population. Research has shown that students in vocational or technical tracks may face higher exposure to smoking environments, weaker enforcement of tobacco-free policies, and greater peer pressure to experiment with tobacco products compared to their peers in general academic settings (A Rahim et al., 2017; Chong et al., 2020). These factors highlight the need for targeted prevention and education initiatives for this group.

Evidence-based health education programmes are a cornerstone of tobacco control efforts. Numerous studies demonstrate that structured educational interventions can significantly improve knowledge, correct misconceptions, and foster negative attitudes towards smoking and vaping among adolescents (Nurumal et al., 2021; Rosendahl et al., 2005; Tahlil et al., 2013). However, in the Malaysian context, studies specifically examining the impact of integrated smoking and vaping education within vocational college settings remain limited. Furthermore, few local studies have simultaneously explored changes in students' knowledge and attitudes and examined the relationship between these variables before and after an intervention (Guo et al., 2022).

In line with Malaysia's national tobacco control efforts and the urgent need to address the rising use of e-cigarettes among teenagers, this study aims to examine how a targeted health education intervention can strengthen students' understanding of the risks associated with smoking and vaping, as well as influence their attitudes towards these behaviours (Nordin et al., 2022). Although numerous international studies have demonstrated the effectiveness of school-based health talks in improving knowledge and perceptions about tobacco, there remains limited local evidence on whether similar programmes are equally impactful for vocational college students. A group that may face unique social and environmental influences compared to peers in general academic institutions.

Given these circumstances, it is crucial to strengthen targeted education initiatives that address both traditional smoking and the growing use of e-cigarettes among vocational college students (Nurumal et al., 2021; St Germain et al., 2017; Tahlil et al., 2013). By focusing on this specific subgroup, the study highlights the importance of tailoring health messages to suit different educational settings and student backgrounds. Emphasising accurate information about nicotine addiction, the health consequences of dual use, and the misconceptions regarding vaping may help reinforce tobacco prevention efforts at the school level.

This study specifically aims to address the existing research gap by focusing on three main research objectives. First, it seeks to measure the baseline level of students' knowledge about the harms of smoking and vaping, as well as to measure any immediate changes following a structured health education session. Second, it explores students' attitudes towards smoking and e-cigarette use, including their intentions and social acceptance of these behaviours, before and after the programme. Third, it investigates the association between students' knowledge and their attitudes, providing insights into whether increased awareness correlates with more negative or rejecting attitudes towards tobacco and vaping. By achieving these objectives, the study aims to generate evidence that can inform future youth-focused health promotion strategies, support national tobacco control policy, and contribute to the development of targeted interventions that address the evolving patterns of tobacco and nicotine use among Malaysian adolescents.

Method

This study employed a quantitative pre- and post-intervention design, conducted as part of a community knowledge transfer programme, to evaluate the effectiveness of a health education session on students' knowledge and attitudes towards smoking and vaping. The target population consisted of Form 4 students from a vocational college in Sepang, Selangor, with an estimated enrolment of 300 students. Using G*Power 3.1 software, the minimum required sample size of 180 students was calculated based on an effect size suitable for repeated measures, with a significance level of 0.05 and a power of 0.80. A purposive sampling technique was used to select students who were present and available during the health talk session, ensuring that only students who attended the full session were included in the post-intervention assessment.

Data were collected using a structured, self-administered questionnaire adapted from previously validated instruments on tobacco and vaping knowledge and attitudes. The instrument was professionally translated into Malay to ensure linguistic appropriateness and cultural relevance. The final instrument consisted of three sections: the first section gathered demographic information such as age, gender, and prior exposure to health talks; the second section assessed knowledge of smoking and vaping through factual statements; and the third section measured attitudes using statements rated with dichotomous (Yes/No) responses to capture agreement or disagreement with specific beliefs or intentions related to smoking and vaping.

To streamline administration and encourage full participation, the questionnaire was digitised using Google Forms and accessed by students via a QR code. Prior to the health talk, students were instructed to use their mobile devices to scan the QR code displayed on the projector screen and printed posters placed in the auditorium. This allowed students to complete the pre-test survey electronically in real time. Immediately after the conclusion of the session, the post-test survey link was provided in the same way, with students scanning a new QR code to access and submit their responses.

Content validity was established through review by two domain experts specialising in tobacco control and adolescent health. This process resulted in an average Scale Content Validity Index (S-CVI/Ave) of 0.82, which is considered acceptable for community research. A pilot test of the instrument was subsequently conducted with 30 students from the same college who were not included in the main study sample. The pilot yielded a Cronbach's alpha of 0.33, indicating that while content validity was strong, further item refinement could improve internal consistency in future implementations.

The intervention consisted of a single, structured health talk focusing on the dangers of tobacco smoking, the health risks associated with e-cigarettes, and common misconceptions about vaping. The session was delivered by a qualified health educator using visual aids and interactive discussion to engage students. Students were asked to complete the pre-test questionnaire immediately before the health talk began, to capture their baseline knowledge and attitudes without prior prompting. Immediately following the conclusion of the session, the same students completed the post-test questionnaire to measure any immediate changes in their responses.

Collected data were checked, coded, and analysed using IBM SPSS Statistics version 29.0. Descriptive statistics, including frequencies and percentages, were used to summarise demographic characteristics and response distributions for each knowledge and attitude item. The Wilcoxon Signed-Rank Test was used to examine paired differences in overall knowledge and attitude scores before and after the intervention, while Spearman's rank-order correlation was applied to test for an association between knowledge and attitudes at both time points. Additionally, Cohen's *d* effect size was also calculated for individual items to provide additional insight into the practical significance of observed differences. All statistical tests used a two-tailed significance level of $p < 0.05$.

Ethical approval for the study was sought and is pending final clearance from the relevant institutional ethics review board. Prior to data collection, written parental consent was obtained for all students under the age of 18, and informed assent was secured from each student participant. Participation was entirely voluntary, and respondents were assured of anonymity and confidentiality throughout the study process. The research adhered to the principles of voluntary participation, the right to withdraw at any time, and secure data storage to protect participants' privacy.

Results

A total of 190 Form 4 students from a vocational college in Sepang, Selangor, completed both the pre-test and post-test questionnaires. Table 1 presents the demographic characteristics of the respondents. The sample consisted of 60% male students ($n = 114$) and 40% female students ($n = 76$). In terms of age, 60% were 17 years old (coded as 2) and 40% were 16 years old (coded as 1). Most respondents (88.9%) reported having previously attended at least one health talk related to smoking, while 11.1% had never attended such a programme before the present intervention. Regarding smoking behaviour, 5.8% of students reported having tried conventional cigarettes, and 13.2% reported having tried e-cigarettes or vaping products, indicating that the majority of participants were non-smokers and non-vapers at baseline.

Table 1. Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	114	60.0
	Female	76	40.0
Age	16 years	76	40.0
	17 years	114	60.0
Attended health talk previously	Yes	169	88.9
	No	21	11.1
Ever tried smoking	Yes	11	5.8
	No	179	94.2
Ever tried vaping	Yes	25	13.2
	No	165	86.8

Objective 1: Changes in Knowledge about Smoking and Vaping

A Wilcoxon Signed-Rank Test was conducted to compare students' knowledge scores before and after the health education programme. The test indicated no statistically significant difference in knowledge scores, $Z = -0.527$, $p = 0.598$. Figure 1 shows that out of the 190 students, 33 showed an increase in knowledge scores, 30 showed a decrease, while the majority, 127 students, showed no change. This suggests that while the programme may have helped a small proportion of students improve their factual knowledge about smoking and vaping, most students retained a similar level of knowledge after the intervention.

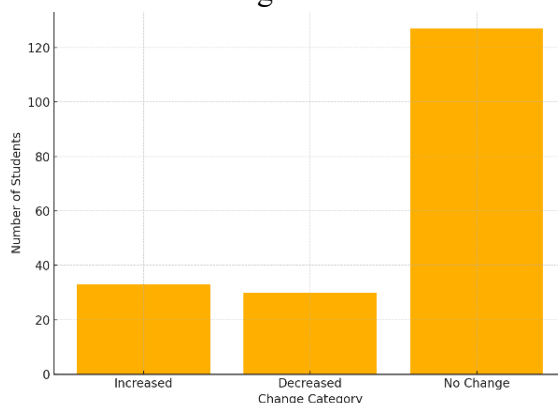


Figure 1: Student's Knowledge Changes After the Program.

Objective 2: Changes in Attitudes towards Smoking and Vaping

To evaluate changes in students' attitudes towards smoking and vaping, a Wilcoxon Signed-Rank Test was also performed. The analysis revealed no statistically significant difference between pre-test and post-test attitude scores, $Z = -1.027$, $p = 0.304$. Figure 2 shows a total of 37 students demonstrated more favourable attitudes following the intervention, whereas 43 students showed a reduction in their attitude scores, indicating less favourable responses post-intervention. Meanwhile, 110 students showed no change in their attitude scores between the two measurement points. Although there were slight shifts in both directions, these changes were not statistically significant.

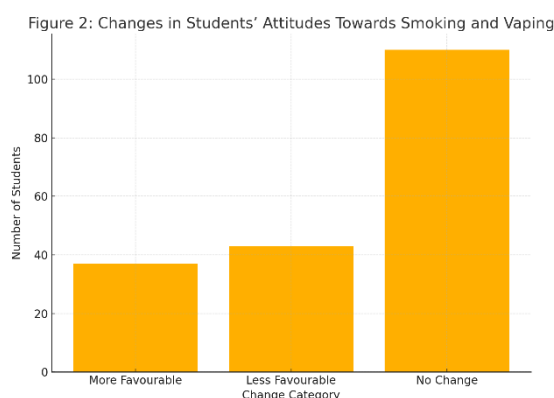


Figure 2: Student's Knowledge Changes After the Program.

Objective 3: Association Between Knowledge and Attitudes

A Spearman's rank-order correlation was conducted to examine the association between students' knowledge and attitudes towards smoking and vaping before and after the health talk. Prior to the intervention, the Spearman's rho coefficient was 0.047, indicating a very weak

positive relationship, which was not statistically significant, $p = 0.520$. Post-intervention, the coefficient increased slightly to 0.100, suggesting a slightly stronger but still weak positive correlation, which remained statistically non-significant, $p = 0.171$. This result implies that there was no meaningful statistical relationship between students' knowledge scores and their attitudes at either time point.

Discussion

The main objective of this article was to evaluate the effectiveness of a single-session health education programme in enhancing students' knowledge and attitudes towards smoking and vaping. In addressing objective 1, the analysis focused on evaluating changes in students' knowledge and attitudes following the single-session health education programme. Although the single-session health education programme did not produce statistically significant changes in overall knowledge or attitude scores, about 17% of students showed meaningful knowledge gains accompanied by modest yet positive attitudinal shifts. These findings suggest that even brief interventions can generate partial learning gains and initiate cognitive engagement among adolescents (Guo et al., 2022; Nurumal et al., 2021).

In addressing objective 2, the discussion examines potential factors influencing the observed outcomes and explores why changes were limited or modest. Several factors may account for the limited overall change. First, nearly 89% of participants had previously attended similar health talks, resulting in a ceiling effect where baseline knowledge was already high. This aligns with prior studies reporting that repeated exposure to conventional anti-smoking education produces diminishing returns among students familiar with the topic (Littlecott et al., 2023). Second, the brief duration and lack of follow-up reinforcement likely restricted deeper attitudinal transformation. Adolescents require sustained engagement to internalize behavioural change; according to the Health Belief Model (HBM), a single exposure may increase perceived severity and susceptibility but often fails to strengthen cues to action or self-efficacy (Rosenstock et al., 1988). Furthermore, adolescents frequently experience information fatigue from repetitive health messages, which can reduce attention and perceived relevance (Toomey, 2023).

In addressing objective 3, this subsection compares the study's findings with prior research and situates them within broader educational and behavioural contexts. The findings mirror those of Guo et al. (2022), who observed minimal gains in students' knowledge following short-term interventions, and Nurumal et al. (2021), who reported similar trends in attitude stability among adolescents. This also supports results from Ranjit et al. (2021) and Radzi et al. (2021), which highlighted persistent misconceptions about vaping's safety despite ongoing awareness campaigns. Conversely, multi-session and peer-led interventions have shown stronger results by maintaining engagement and social reinforcement (Versloot-Swildens et al., 2024; Liu et al., 2023). Therefore, the present study reinforces the evidence that one-off health talks, while informative, rarely sustain behavioural impact without continued reinforcement or contextual integration.

When interpreted through behavioural change theories, the findings become clearer. The Theory of Planned Behaviour (TP) (Ajzen, 1991) suggests that attitude formation and intention to act depend on perceived behavioural control and normative influences. Although knowledge may inform attitudes, it is insufficient without supportive environmental and social cues. Similarly, Bandura's Social Cognitive Theory (SCT) (Bandura, 2004) emphasises the

interaction between personal factors (knowledge and beliefs), behavioural capability (skills and reinforcement), and environmental context (peer norms, family influence). Since this programme primarily addressed cognitive awareness rather than social modelling, a limited correlation between knowledge and attitude was expected. These theoretical explanations strengthen the argument that health education should combine factual information with environmental and social interventions to yield durable change.

This study's novelty lies in its focus on vocational college students, a group underrepresented in Malaysian tobacco education research. Previous studies have largely centred on general secondary students (A Rahim et al., 2017; Chong et al., 2020). By identifying selective improvements, especially the correction of vaping misconceptions, this study reveals the potential of targeted, context-specific programmes to influence micro-level learning outcomes. The results also extend understanding of how cognitive and affective domains interact within brief educational exposures, providing insight for designing modular interventions that can be scaled or embedded within national curricula.

From an educational standpoint, the non-significant Wilcoxon results should not be dismissed as ineffective but interpreted through a practical significance lens. The 17% of students who demonstrated improvement represent early cognitive activation that, with consistent reinforcement, could translate into wider behavioural shifts. Embedding similar talks within multi-session programmes, incorporating digital gamified learning, and employing peer-mentoring can enhance message retention and attitudinal change (Liu et al., 2023). Collaboration between schools, parents, and community health authorities is essential to reinforce tobacco-free norms across settings (Nordin et al., 2022). Additionally, educators should tailor content to contemporary adolescent contexts, addressing vaping trends, social media marketing, and peer influence to maintain relevance and engagement.

This study contributes to the growing body of Malaysian adolescent health research by illustrating how short-term educational interventions serve as catalysts for initial awareness but not necessarily as agents of sustained change. By integrating multiple theoretical models, Theory of Planned Behaviour (TPB), Health Belief Model (HBM) and Bandura's Social Cognitive Theory (SCT), the research offers a holistic explanation of the interaction between cognition, attitude, and environment. It advances understanding of how prior exposure, message fatigue, and social context moderate learning outcomes, thereby informing future multi-theory, context-driven programme designs that can bridge the gap between knowledge and behaviour in adolescent tobacco prevention.

Conclusion

In conclusion, this study demonstrated that a single-session health education programme did not yield statistically significant changes in students' overall knowledge and attitudes toward smoking and vaping. Nonetheless, the intervention successfully corrected key misconceptions, particularly concerning the perceived safety of e-cigarettes, suggesting that even a brief educational exposure can initiate meaningful cognitive engagement and awareness on specific health risks.

These findings warrant careful interpretation, considering the methodological limitations inherent in the study design. The single-group pre-post design restricts the ability to establish causality, as improvements may partly reflect external influences such as prior exposure to

health campaigns or concurrent social messaging. Additionally, the use of self-reported questionnaires introduces the potential for social desirability bias, wherein students may overstate positive attitudes or underreport risk behaviours to align with perceived expectations. Such factors may have diluted measurable effects and explain the modest observed changes.

Moving forward, implementing multi-session, longitudinal interventions with control or comparison groups would provide more robust evidence of effectiveness. Incorporating interactive, peer-driven activities, family participation, and community reinforcement could strengthen message retention and behavioural translation. As vocational college students represent a distinct and vulnerable subgroup, continued investment in tailored, theory-informed programmes remains essential. Overall, this study contributes empirically grounded insights that can guide educators and policymakers in designing sustainable, evidence-based tobacco prevention strategies for Malaysian adolescents.

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