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HEALTH BELIEF MODEL PERCEPTIONS OF MALAYSIAN ADULT E-CIGARETTE USERS: A GENDER ANALYSIS

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ABSTRACT

This study uses the Health Belief Model (HBM) as a tool to answer two research questions: 1) Are there differences in HBM perceptions based on the gender of Malaysian adult e-cigarette users? ; 2) Do gender norms influence e-cigarette use in Malaysia? A survey of 280 Malaysian adult e-cigarette users was conducted. Overall, gender did not have a statistically significant effect on 14 of the HBM perception statements analysed. The chi-square test showed that gender had a significant influence on two of the perception statements, while the ordered logit regression analysis revealed statistically significant differences in three of the perception statements. The implication of these findings on future public health policy aiming to reduce smoking prevalence in Malaysia must take into account the narrowing gender gap in relation to the use of e-cigarettes and the rising popularity of these nicotine delivery devices, particularly among youth.

Keywords: *Gender, Smoking, E-cigarette, Health Belief Model, Vape*

INTRODUCTION

Asian countries are in the early stages of the tobacco smoking epidemic (Lee et al., 2021). Southeast Asia is home to nearly one-fifth of the world's smokers (nearly 237 million), and more than 80% of the world's smokeless tobacco users (301 million). Nearly 1.6 million die each year because of tobacco use in the region (WHO, 2020). The projected prevalence of consuming any tobacco product among males aged 15 years and above in 2020 was 40.2% in Malaysia, 39.7% in Thailand, 46.9% in South Korea, 28.3% in Singapore, 14.3% in Australia, and 10.0% in Hong Kong (WHO, 2015). The annual expenditure on purchasing one pack of cigarettes, is US$5,628.30 in Australia, US$3,777.75 in Singapore, US$2,799.55 in Hong Kong, US$1,529.35 in Malaysia, US$1,467.30 in South Korea, and US$657.00 in Thailand. The lifetime spending on purchasing one pack of cigarettes a day is US$308,993.67 for Australia, US$207,398.48 for Singapore, US$318,588.79 for Hong Kong, US$80,261.31 for South Korea, US$72,338.26 for Malaysia, and US$31,207.50 for Thailand (Lee et al., 2021).

Tobacco and E-cigarette Survey done among Malaysian adolescents reveals that smoking-related diseases have been a major cause of mortality among the Malaysian population since the 1980s and if the trend persists, the mortality rate is expected to triple by 2030 (MOH, 2016b). The National Health and Morbidity Survey 2022 also found that the current prevalence of tobacco product use among Malaysian adolescents is 18.5%, with the majority (14.9%) using e-cigarettes (MOH, 2022). Malaysia has set the year 2040 as target to reduce smoking prevalence to less than 5% nationwide but there is concern whether Malaysia would be able to achieve this target with male smoking prevalence recording a mere a marginal drop from 43% in 2015 to 40.5% in 2019 while female prevalence rising by 0.2% (MOH, 2019).

The International Tobacco Control Policy Evaluation Project conducted between 2009 and 2013, through a survey of e-cigarette use in ten countries, including Netherlands, Brazil, Australia, United Kingdom, United States, and Republic of Korea, found Malaysia to be the

country with the highest prevalence of users at 14% (Gravely et al., 2014). By 2047, the use of e-cigarette is predicted to surpass the traditional tobacco industry in sales (Robehmed, 2013). E-cigarette usage could re-normalise smoking because it could be a gateway for adults and young people who have never smoked tobacco before, to take it up and develop an addiction (Mohamed, 2016). In 2019, e-cigarettes were sold in six Southeast Asian markets with a total market value of US$595 million which is projected to grow to US$766 million by 2023. Populous countries with weak e-cigarette regulations, notably Indonesia, Vietnam, the Philippines, and Malaysia, are desirable targets for transnational tobacco companies (van der Eijk et al., 2021).

Despite its relatively small population of 32 million, the Malaysian e-cigarette market grew almost five-fold in 2012–2015 (from RM106 million to RM514 million), before falling to less than half (RM229 million) in 2016 (EF Education Index, 2020). The sharp drop was due to a 2015 ban on e-liquids containing nicotine when the Malaysian National Fatwa Council declared that e-cigarettes as *haram* (forbidden), and vaping was banned in Penang, Kedah, Johor, Kelantan, and Terengganu in 2015–2016, covering a third of Malaysia's population (van der Eijk et al., 2021). The National E-cigarette Survey 2016 (MOH, 2016), which looked at the prevalence and population demographics of adults, found that over 40% of current e-cigarette users started the habit between ages of 12 and 15, and were likely to be younger, male, and with higher education levels. The objective of this study as such is to assess HBM perceptions of e-cigarette use based on gender, with specific focus on males.

LITERATURE REVIEW

Smoking, like other behaviours that has an impact on health (Courtenay, 2000), is a gendered phenomenon (Hunt, Hannah, & West, 2004). There is still a lack of gender focus in tobacco control research, despite cigarettes being around for over 200 years (Hunt, Hannah & West, 2004). Gender analysis thus forms the foundation of the conceptual framework research, where HBM is used as a tool to assess perceptions of e-cigarette users.

The Health Belief Model (HBM) is a framework from social psychology which posits that people will take action to prevent illness if they regard themselves as: (1) susceptible to a condition (perceived susceptibility); (2) if they believe it would have potentially serious consequences (perceived severity); (3) if they believe that a particular course of action available to them would reduce the susceptibility or severity or lead to other positive outcomes (perceived benefits); and (4) if they perceive few negative attributes related to the health action (perceived barriers) (see Jones et al., 2015).

According to Rosenstock (1974) and Glanz et al., (2002), perceived susceptibility examines the individual's opinions about how likely the behaviour they partake in is going to lead to a negative health outcome; while perceived severity addresses how serious the diseases that a person is susceptible to can be. The authors also explained perceived benefits as a person having the will to stop only if there is a benefit such as greater quality of life and better health and they categorised perceived barriers as anything from losing friends to not having enough money, or even self-efficacy problems, such as not believing in oneself. For change to take place, the benefits must be stronger than the barriers. Perceived barriers are a significant predictor of behaviour (Carpenter, 2010; Janz & Becker, 1984; and Jones et al., 2015). Subsequently HBM scholars suggest that self-efficacy and cues to action be added to the model—though these were of a fleeting nature, not systematically evaluated and rarely applied in studies.

The HBM has been widely used in tobacco cessation studies. Supported by systematic reviews, the HBM has been successfully used to predict long-term adherence behaviours (see Table 1), with the potential to use it as a tool to develop interventions in nicotine addiction (Webb et al., 2010). The model is used in this study to examine local e-cigarette usage and

culture, given that stakeholders claim that these devices have been effective in helping many smokers kick the habit, despite the lack of local studies to back their public policy calls.

Table 1: Theories of behaviour change used to inform interventions for addictive behaviour

Behaviour change theories	Effectiveness for designing interventions	Discussion
Control theory Suggests that once a goal has been set, it serves as a reference value in a control system that compares the current rate of behaviour change against this point of reference	Useful integrative framework for understanding the process of self-regulation; may be especially effective in breaking bad habits	Although the central concept of behavioural monitoring has been used in interventions, the theory is rarely used to develop interventions for addictive behaviours
Goal-setting theory Suggests that goal difficulty and goal specificity influence performance	Developed for organisational and laboratory settings	Goal-setting is a core component of behavioural interventions to reduce problem drinking and facilitate smoking cessation
Model of action phases Delineates a series of distinct phase to goal-striving	Interventions based on this theory is effective in the early stages of addiction	Not effective where addictions are strong
Strength model of self-control Self-regulation	Interventions based on this theory are intended to strengthen self-regulatory capacity and directly influence the likelihood that the person is able to act to reduce discrepancies between their goal and current behaviour	Yet to be applied to develop intervention for addictive behaviours
Protection motivation theory Proposes sets of modifiable beliefs as predictors of intention to act and behaviour	Positive implications on interventions designed to promote change in addictive behaviour	N/A
Theory of planned behaviour Proposes that behavioural intentions are a function of attitudes and subjective norms	Offers valuable insights when combined with research that maps putative determinants of behaviour with behaviour change techniques	Limited information on how to change behavioural beliefs and develop interventions
Elaboration likelihood model Delineates two routes by which people can be persuaded by an intervention, with the main outcome being the level of message acceptance and changes in reference values	Requires much effort but likely to promote enduring behavioural change	Need to genuinely convince people in order to promote sustained efforts to change difficult behaviours Rarely used to design interventions to change addictive behaviours

Table 1 (continued)

Prototype willingness model Social variables can influence behaviour automatically without instigating a change in beliefs	Direct influence on behaviour unmediated by intention	Few interventions have used the theory's constructs directly
Social cognitive theory Intention is an important determinant of future action with self-efficacy a main driver of behaviour	Interventions must target either enactive mastery experiences; vicarious experiences; verbal persuasion; or/and psychological and affective states to impact self-efficacy	Successfully used to develop interventions for addictive behaviours
HBM Suggests that changes in behaviour result from changes in putative social-cognitive determinants of behaviour thus interventions should target these determinants	Effective in promoting a range of health behaviours	Used in reducing tobacco usage interventions but not explicitly to develop an intervention for addiction

Source: Webb et al., (2010)

A study of gender differences in the psychological determinants of cigarette smoking suggests that the psychological mechanisms of smoking behaviour are similar in men and women, which indicates that acting on variables that influence smoking behaviour, would have similar effects on men and women (Etter et al., 2002). While males were found to be more likely to smoke every day as opposed to females who were more likely to want to quit smoking (Chinwong et al., 2018), traditional gender roles have been changing which has affected the overall mortality rate of men and women as males are increasingly taking less health risks as compared to women (Flandorfer et al., 2010).

While there is no evidence of gender differences in females and males using e-cigarettes to quit smoking or to maintain abstinence, there are gender differences in vaping patterns and consistent monitoring of gender differences is necessary (Lee & Oh, 2019). Many of the gender differences with e-cigarette usage parallel those previously found with traditional cigarette smoking—then men who were studied appear to use e-cigarettes more for the effects of nicotine as a stimulant, with some claiming to use e-cigarettes to boost their energy levels, whereas women use more for non-nicotine related reasons (e.g., social influence, appearance, weight control, and dealing with stress and mood) (Piñeiro et al., 2016). Gendered differences are found in the type of e-cigarette used, flavours used, nicotine dosage, source of information about e-cigarettes, place of purchase, and use of e-cigarettes where smoking is prohibited. In addition, males were more likely to report initiating e-cigarette use to quit smoking due to health concerns, whereas females were more likely to report initiation based on recommendations from family and friends. Males reported higher attributions for maintenance of e-cigarette use related to positive reinforcement (enjoyment), whereas females reported higher negative reinforcement attributions (stress reduction or mood management). Additionally, males reported more positive expectancies about e-cigarettes, including taste, social facilitation, and energy, whereas women rated e-cigarettes higher for weight control. Males also reported greater addiction-related e-cigarette expectancy than females (Piñeiro et al., 2016), although female never-smokers are also less likely than male never smokers to experiment with e-cigarettes (Lee & Oh, 2019).

METHODOLOGY

A quantitative approach was used to analyse the health belief perceptions of e-cigarette users through a survey, using a non-probability purposive sampling of adult e-cigarette users from 38 retail outlets for e-cigarette products in urban areas of the Klang Valley. The survey questionnaire was administered to e-cigarette users; i.e. vapers who purchased their e-cigarettes at these retail outlets. The outlets were chosen as they were part of the country's biggest e-cigarette store chain. Of the 380 survey questionnaires administered, 280, or 74%, were filled out by 41 female vapers and 239 male vapers, between July and August, 2019. A response rates approximating 60% is acceptable (Fincham, 2008), and therefore, this survey's response rate is adequate for the purpose of generalising to the rest of the Malaysian population of e-cigarette users.

The survey questionnaire was adapted from the HBM's 39-item Likert-type scale developed by Champion (1984). The Likert-scale questionnaire focused on four main HBM perceptions, namely, benefits, susceptibility, severity and barriers. Respondents were asked to respond using a five-point Likert scale rated 'Strongly Agree', 'Somewhat Agree', 'Neutral', 'Somewhat Disagree' and 'Strongly Disagree'. The questionnaire was in English and Bahasa Malaysia to ensure that the respondents were clear about what was being asked. The face and content validation of the items in the quantitative instrument were done by six tobacco cessation experts and addiction specialists from Universiti Malaya and the University of Auckland. Thirty items were included in the draft questionnaire, which was pretested among 30 e-cigarette users. The final version of the instrument contained 18 items that were either retained or adapted with minor modifications made to ensure relevancy and clarity based on the Content Validity Index (CVI) and Cohen's Kappa to evaluate the input of the content experts. The questionnaire garnered a Cronbach Alpha score of 0.782, indicating satisfactory to good reliability and internal consistency.

A chi-square test was carried out using Microsoft Excel to find out if gender and the respondents' perceptions were independent of each other. Software for statistics and data science (Stata) was used to do an ordered logit regression analysis of gender effects on the users' HBM perceptions. Using Stata, an ordered logit model to estimate the magnitude of their associations was carried out. A two-tailed test of significance for each of the log-odds for gender, comparing responses from male and female respondents, was also conducted.

This study was approved by both the Universiti Malaya Ethics Committee (Reference no. UM. TNC2/UMREC - 422) and the Ministry of Health Medical Research Ethics Committee (NMRR ID: NMRR-18-2005-41501 IIR). At the start of the study, the respondents were briefed on the details of the study, reminded that their participation was voluntary, assured that their identities would be kept anonymous, and informed that the data would be used only for the purpose of this study, and finally asked to sign a consent form. All interviews were recorded using a tape recorder, and saved on a laptop which was password protected, with the knowledge of the respondents.

RESULTS

All 280 respondents are current e-cigarette users comprising 41 female vapers and 239 male vapers. Seventy-one percent, or 199 of the respondents who currently use the devices, use it daily while 29% (81 respondents) use the devices at least four times a week. A total of 171, or 61% of the respondents use it with nicotine. Only 35% (98), said they do not use nicotine while 4% (11), did not respond. Overall, gender did not have a statistically significant effect on 14 of the HBM perception statements analysed. The chi-square test showed that gender has an influence on two of the perception statements while the ordered logit regression analysis (see

Appendix) revealed statistically significant difference between how males and females responded in three of the perception statements.

Figures 1 to 4 analyses the responses from male vapers only based on four dimensions namely susceptibility, severity, benefits and barriers. Men feel susceptible to respiratory conditions and know that e-cigarette is harmful but the benefits – namely feeling less anxious about smoking-related diseases, believing that e-cigarettes can help them quit tobacco cigarettes and believing that they have more to gain from vaping than from smoking – outweigh the barriers to e-cigarette use. Unlike tobacco smoking where there is a gender difference in terms of uptake—with more men smoking as opposed to women because it is still distasteful for females to smoke—the addiction to e-cigarettes have undermined gender norms. In sum, the quantitative results indicate that gender is statistically insignificant except in some specific HBM perception statements which indicate that gender differences in uptake is lower. The male responses are presented below according to the HBM susceptibility, severity, benefit and barrier perceptions.

For susceptibility, gender is not a statistically significant variable in relation to the respondents' susceptibility perceptions. Nevertheless, it is interesting to note that for both susceptibility statements, i.e., 'My chances of getting e cig/vape-related health problems (e.g., respiratory issues) are high' and 'I worry a lot about getting e-cig/vape-related diseases', males recorded the highest percentage for being neutral (see Figure 1). As for the statement 'I worry a lot about getting e-cig/vape-related diseases', which is statistically significant, as determined from the discussion of ordered logit regression on the survey perception statements by demographic variables, 21.3% (n = 51) and 22.2% (n = 53) of the men 'strongly disagree' and 'somewhat disagree' respectively. At the other end of the spectrum, only 7.1% (n = 17) of male respondents 'strongly agree' with the statement 'I worry a lot about getting e-cig/vape-related. This finding is also reflected in the marginal effects.

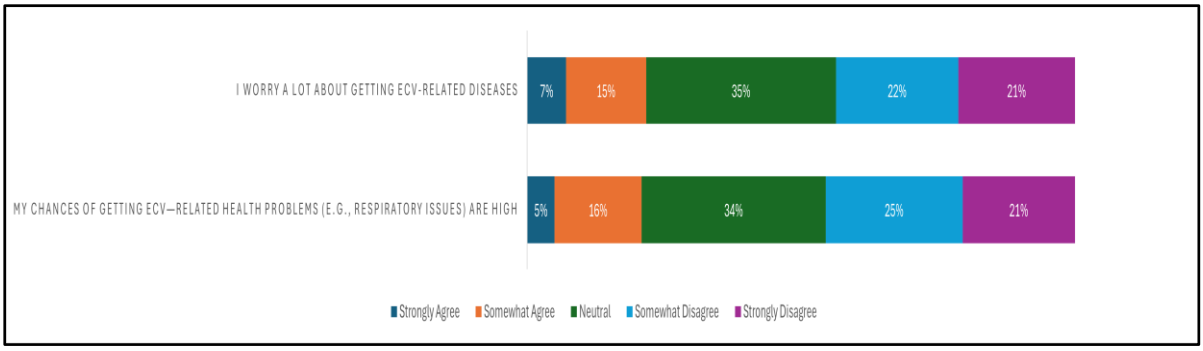

Figure 1: Percentage of E-cigarette and Vape 2019 Survey male responses for perception statements on susceptibility

For severity, only the statement 'My financial security would be endangered if I got e-cig/vape-related diseases' crossed the threshold of statistical significance. In other words, there is enough evidence to reject the null hypothesis that gender is independent of the perception statement. More men 'somewhat' and 'strongly' disagreed that their financial security would be endangered if they contract e-cigarette-related disease (n = 98, 42%) (see Figure 2), as opposed to women (n = 14, 34.2%).

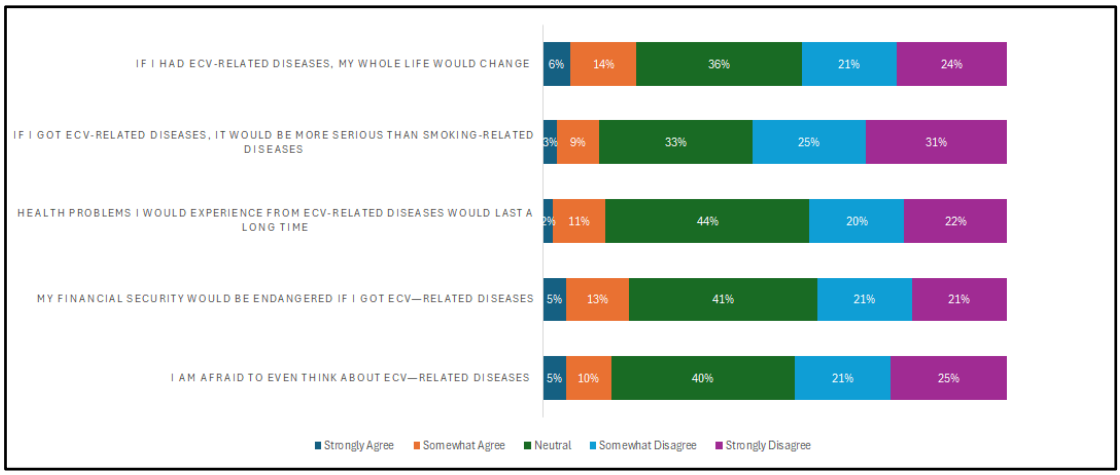

Figure 2: Percentage of E-cigarette and Vape 2019 Survey male responses for perception statements on severity

For benefits, the chi-square tests show that the statement 'I would not be anxious about smoking-related diseases if I used e-cigs/vape' can be explained by gender differences as it crosses the 90% CI threshold. The cross-tabulation of 'I would not be anxious about smoking-related diseases if I used e-cigs/vape' suggests that a lower proportion of males have a tendency to 'somewhat disagree' and 'strongly disagree' that they would not be anxious about smoking-related diseases as opposed to females. Almost half of the men surveyed, or 47%, either strongly or somewhat agreed, when asked if using e-cigarettes caused them to no longer be anxious about smoking-related diseases (see Figure 3). The majority of men were neutral.

For the statement 'Using e-cigs/vaping prevents future problems for me', which is statistically significant under the ordered logit regression estimation, more men – as compared to women – agreed rather than disagreed, that using e-cigarettes will prevent future problems for them. More than half the male respondents, or 53%, either strongly or somewhat agreed with the statement. This finding is also reflected in the marginal effects.

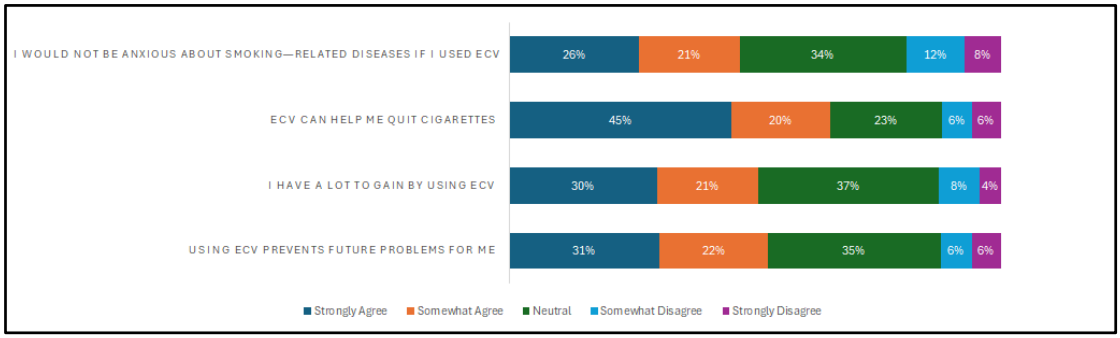

Figure 3: Percentage of E-cigarette and Vape 2019 Survey male responses for perception statements on benefits

For barriers, the chi-square tests and ordered logit regression show that the variation in perceived barriers is not statistically significant for the gender variable. Thus, the perception statements on barriers are not discussed here. It is nonetheless interesting to note that the majority of the men surveyed disagreed – either somewhat or strongly – with all the barrier

statements concerning the use of e-cigarettes, with most expressing positive feelings towards vaping (see Figure 4).

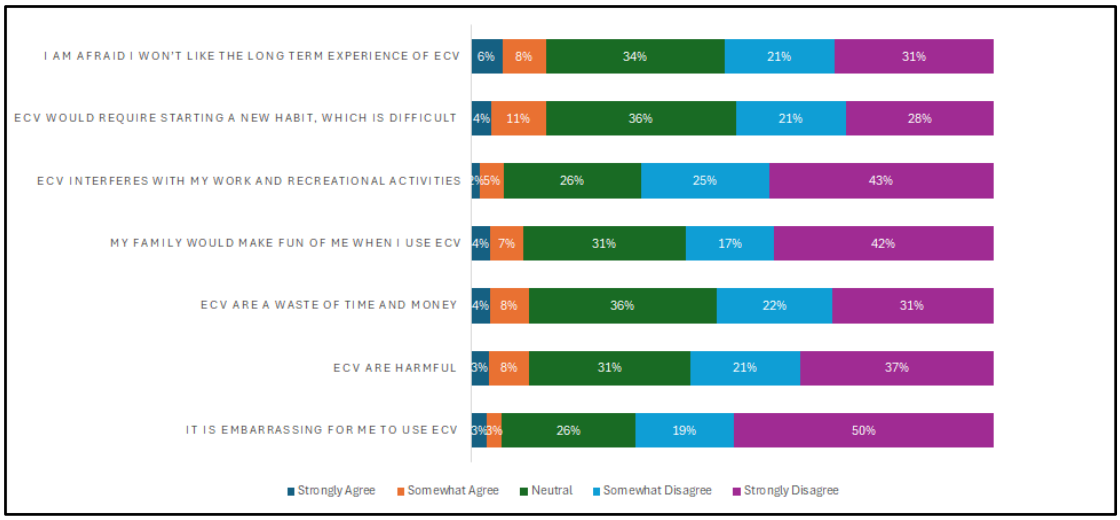

Figure 4: Percentage of E-cigarette and Vape 2019 Survey male responses for perception statements on barriers

DISCUSSION

The authors take note of the conceptual difficulties, namely poor operationalisation of the model and the failure to check the reliability and validity of the HBM constructs discussed above, but are nonetheless satisfied that items developed to measure susceptibility, severity, benefits, and barriers following reliability and validity checks in a previous study (Champion, 1984) have sufficiently addressed these drawbacks. Moreover, Abraham and Sheeran (2005) note that these are "an example of good practice in the design of a study applying the model." Hence, Champion's (1984) methods are followed closely to effectively use the HBM to understand and explore e-cigarette use. Of the 18 HBM perceptions included in the survey questionnaire, the results show that gender only significantly affects the male respondents' perceptions when it comes to anxiety about smoking-related disease when using e-cigarettes; financial security if the user is taken ill because of e-cigarettes; the use of e-cigarettes in preventing future problems; and concerns about e-cigarette-related diseases.

The results echo an earlier Hong Kong study which found that smoking tobacco cigarettes was highly de-normalised among its Chinese population, and that e-cigarettes probably acted as a substitute for conventional cigarettes (Wang et al., 2015). This is in line with rising global prevalence of e-cigarette use among young people, especially young boys (Salari, et al., 2024). This study also confirms the prevalence pattern in Bahrain where males tend to have positive attitudes toward e-cigarette smoking (AlSayyad, et al., 2024).

E-cigarette use is seen purely as a health issue. Men are not influenced by gender norms or stereotypes when it comes to the use of these devices. None of the male respondents felt that their masculinity was eroded by them using these products. Unlike tobacco cigarettes that are generally perceived as being more masculine, e-cigarettes are seen as more feminine. The men were not embarrassed when teased due to the bright colours, fruity flavours and trendy designs of e-cigarettes. They were not concerned about using traditionally 'soft' or 'girly' e-liquid flavours, like chocolate and fruits, when they vape. The findings show that gendered norms,

such as notions of masculinity and femininity, generally have little influence on the use of e-cigarettes, thus promoting greater homogeneity in the use of these products. This is in line with the results of previous studies indicating that males appear to be more prone to e-cigarette uptake despite the presence of several factors that appear to encourage the use in females more than in males (Alam & Silveyra, 2023).

Contrary to Piñeiro et al., (2016), which found that many of the gender differences with e-cigarettes parallel those found in traditional cigarette smoking this study revealed that generally, male uptake of e-cigarettes was driven by positive health perceptions. Our study shows that gender has little influence on the HBM perceptions of users of e-cigarettes. This is echoed in the chi-square and ordered logit regression results of this study where gender was statistically insignificant for 14 out of the 18 HBM perception statements that were collected. The chi-square test shows that the variation in HBM perceptions can only be explained by gender in two out of the 18 questions while the ordered logit regression estimates show that the variation in these perceptions can only be explained by gender in three out of the 18 statements.

This research affirms that the lack of major gender differences among e-cigarette users could be a reflection of changes in gender norms which promote greater homogeneity, notably in relation to leisure activities (Wilkinson & Howard, 1997); and the changing health behaviour of men and women with the former increasingly adopting feminine lifestyles according to body sensitivities and health check-ups and the latter taking on more risky behaviour (Flandorfer, Wegner & Buber, 2010). It was clear from the data that men and women shared very similar views of the HBM perceptions of e-cigarettes use. Gender norms become irrelevant when addiction to nicotine is present.

We can deduce from the data that unlike tobacco cigarette smokers who fit into gender stereotypes of masculinity and femininity, female users in our study do not perceive the devices as a tool to challenge gender norms, to fight patriarchy or as a symbol of empowerment. Similarly, the male users were not concerned about using traditionally "soft" or "girly" e-liquids like chocolate and fruity flavours when they vape. E-cigarettes are important in conversations on undifferentiated health related behaviour in women and men especially in relation to addiction because it appears to level the playing field for both men and women organically – there did not appear to be any concentrated effort by either males or females to use the devices to challenge or to reinforce gender stereotypes associated with smoking but the industry's marketing strategy is to sell the product by not destabilising symbols of femininity or masculinity.

Further, this study posits that the relational theory of gender and men's health does not apply to the use of e-cigarettes as men are not using these devices "to demonstrate idealised forms of masculinity in order to assume positions of power relative to women" (Courtenay, 2000). On the contrary, e-cigarettes are promoted as a less harmful alternative to conventional tobacco cigarettes. And, the shared perceptions of e-cigarettes among men and women and their uptake of vaping do not "help to sustain and reproduce social inequality and the social structures that, in turn, reinforce and reward men's poor health habits (Courtenay, 2000). Courtenay (2000) also put forward the theoretical argument that from a feminist perspective, the health beliefs and behaviours of men and women preserve existing power structures and the many privileges enjoyed by men. The findings of this study shows otherwise as both genders are shown to adopt similar health beliefs and behaviours—particularly if they are users of the devices themselves.

While it has been used to study smoking behaviour, HBM is more widely associated with healthy eating habits and health screenings. This research extends the use of the model as a tool to explore the use of e-cigarettes and the transition from tobacco cigarettes to e-cigarettes among smokers. Though the literature review is still inconclusive with regard to whether or not e-cigarettes are a healthier and safer alternative to smoking tobacco cigarettes, the uptake of e-cigarettes is generally perceived by its users as better than smoking. This is how e-cigarettes

are being promoted in Malaysia by the industry and while this research does not look into the veracity of such a claim, it explored user's perception of e-cigarettes as a less harmful product using the HBM.

This study, which provides evidence-based information on this under-studied aspect, using a quantitative approach, generates gender-specific data that is crucial for policy making as the traditional tobacco industry has been digitally disrupted by technology.

CONCLUSION AND RECOMMENDATIONS

This study is novel, as it analyses the HBM perceptions of Malaysian e-cigarette users from a gender perspective to "explicate health impacts and provide a sound basis for policies and programmes" (World Health Organization, 2003). By focusing on adult users, this study eliminates responses from those who were merely experimenting with the devices as well as biased views of non-users in order to guide the formulation of policies that can effectively ensure Malaysia achieves the target of becoming a smoke-free nation by 2040. More research is needed with a specific focus on gender with regards to e-cigarette use.

As almost all respondents do not seem to be aware of nicotine addiction, it is recommended that public health campaigns focus on nicotine as a dangerous, addictive substance especially as technology in electronic nicotine delivery devices is fast evolving. With smoking, the challenge was to develop women-centric tobacco control programs to stem the second wave of the tobacco epidemic particularly in third world countries (Amos. et al., 2000). Similarly, gender-centred programmes to curb e-cigarette use among women should be given serious consideration as the use of these devices continue to rise with females adopting riskier health behaviour associated with men in previous HBM studies.

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CONFLICT OF INTERESTS

The authors declare that they have no competing interests, financial or otherwise, related to the current work.

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APPENDIX

Average Marginal Effects from the Ordered Logistic Regression for the E-Cigarette and Vape 2019 Survey

E-cigarette and vape (ECV) 2019 Survey: Perceptions of Malaysian adults based on the Health Belief Model (HBM) **statements 1 – 8*

VARIABLES	Using e-cigs/ vaping prevents future problems for me	I have a lot to gain by using e-cigs/vaping	E-cigs/vaping can help me quit cigarettes	I would not be anxious about smoking—related diseases if I used e-cigs/vape	My chances of getting e-cig/vape—related health problems (eg: respiratory issues) are high	I worry a lot about getting e-cig/vape—related diseases	I am afraid to even think about e-cig/vape—related diseases	My financial security would be endangered if I got ecig/vape—related diseases
Strongly Agree								
MALE	0.295***	0.274***	0.445***	0.253***	0.0394***	0.0648***	0.0474***	0.0528***
	(0.0301)	(0.0294)	(0.0338)	(0.0285)	(0.0111)	(0.0143)	(0.0123)	(0.0130)
FEMALE	0.186***	0.233***	0.369***	0.262***	0.0572***	0.118***	0.0782***	0.0989***
	(0.0501)	(0.0567)	(0.0725)	(0.0612)	(0.0217)	(0.0374)	(0.0286)	(0.0330)
Pr[MALE=1|Strongly Agree=1] - Pr[FEMALE=1|Strongly Agree=1]	0.109	0.041	0.076	-0.009	-0.0178	-0.0532	-0.0308	-0.0461
Somewhat Agree								
MALE	0.242***	0.234***	0.224***	0.229***	0.143***	0.135***	0.0985***	0.131***
	(0.0278)	(0.0271)	(0.0270)	(0.0265)	(0.0220)	(0.0209)	(0.0180)	(0.0208)
FEMALE	0.202***	0.221***	0.227***	0.232***	0.190***	0.207***	0.147***	0.209***
	(0.0345)	(0.0321)	(0.0274)	(0.0316)	(0.0467)	(0.0443)	(0.0404)	(0.0467)
Pr[MALE=1|Somewhat Agree=1] - Pr[FEMALE=1|Somewhat agree=1]	0.04	0.013	-0.003	-0.003	-0.047	-0.072	-0.0485	-0.078
Neutral								
MALE	0.359***	0.381***	0.235***	0.323***	0.365***	0.363***	0.395***	0.404***
	(0.0309)	(0.0316)	(0.0274)	(0.0297)	(0.0310)	(0.0307)	(0.0308)	(0.0309)

FEMALE	0.437***	0.413***	0.277***	0.318***	0.394***	0.388***	0.442***	0.430***
	(0.0440)	(0.0490)	(0.0472)	(0.0402)	(0.0353)	(0.0325)	(0.0370)	(0.0329)
Pr[MALE=1|Neutral=1] - Pr[FEMALE=1|Neutral=1]	-0.078	-0.032	-0.042	0.005	-0.029	-0.025	-0.047	-0.026
Somewhat Disagree								
MALE	0.0544***	0.0741***	0.0521***	0.127***	0.259***	0.226***	0.197***	0.217***
	(0.0131)	(0.0156)	(0.0129)	(0.0205)	(0.0282)	(0.0271)	(0.0253)	(0.0262)
FEMALE	0.0878***	0.0891***	0.0678***	0.122***	0.219***	0.165***	0.160***	0.153***
	(0.0271)	(0.0273)	(0.0223)	(0.0328)	(0.0404)	(0.0358)	(0.0331)	(0.0346)
Pr[MALE=1|Somewhat disagree=1] - Pr[FEMALE=1|Somewhat disagree=1]	-0.0334	-0.015	-0.0157	0.005	0.04	0.061	0.037	0.064
Strongly Disagree								
MALE	0.0499***	0.0362***	0.0441***	0.0683***	0.194***	0.212***	0.262***	0.194***
	(0.0123)	(0.0106)	(0.0116)	(0.0151)	(0.0250)	(0.0264)	(0.0286)	(0.0255)
FEMALE	0.0875***	0.0447**	0.0594***	0.0654***	0.140***	0.123***	0.172***	0.109***
	(0.0298)	(0.0175)	(0.0214)	(0.0225)	(0.0409)	(0.0368)	(0.0503)	(0.0330)
Pr[MALE=1|Strongly disagree=1] - Pr[FEMALE=1|Strongly disagree=1]	-0.0376	-0.0085	-0.0153	0.0029	0.054	0.089	0.09	0.085
Observations	273	273	273	273	273	273	273	273

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

E-cigarette and vape (ECV) 2019 Survey: Perceptions of Malaysian adults based on the Health Belief Model (HBM) **statements 9 – 18*

VARIABLES	Health problems I would experience from e-cig/vape—related diseases would last a long time	If I got e-cig/vape—related diseases, it would be more serious than smoking-related diseases	If I had e-cig/vape-related diseases, my whole life would change	It is embarrassing for me to use e-cigs/ vape	E-cig/vape are harmful	E-cig/vape are a waste of time and money	My family would make fun of me when I use e-cig/vape	E-cig/vape interferes with my work and recreational activities	E-cig/vaping would require starting a new habit, which is difficult	I am afraid I won't like the long term experience of e-cigs /vaping
Strongly Agree										
MALE	0.0198***	0.0316***	0.0559***	0.0186	0.0232***	0.0309***	0.0354***	0.0126**	0.0271***	0.0476***
	(0.00768)	(0.00982)	(0.0135)	(0.249)	(0.00842)	(0.00968)	(0.0109)	(0.00581)	(0.00928)	(0.0124)
FEMALE	0.0241**	0.0423**	0.0779***	0.0236	0.0249**	0.0427**	0.0319**	0.0149*	0.0193**	0.0522***
	(0.0113)	(0.0169)	(0.0270)	(0.314)	(0.0113)	(0.0172)	(0.0132)	(0.00791)	(0.00867)	(0.0191)
Pr[MALE=1|Strongly Agree=1] - Pr[FEMALE=1|Strongly Agree=1]	-0.0043	-0.0107	-0.022	-0.005	-0.0017	-0.0118	0.0035	-0.0023	0.0078	-0.0046
Somewhat Agree										
MALE	0.0914***	0.0723***	0.132***	0.0244	0.0634***	0.0651***	0.0644***	0.0319***	0.104***	0.0704***
	(0.0174)	(0.0154)	(0.0208)	(0.312)	(0.0145)	(0.0146)	(0.0148)	(0.00969)	(0.0189)	(0.0155)
FEMALE	0.108***	0.0934***	0.170***	0.0306	0.0677***	0.0866***	0.0587***	0.0374**	0.0770***	0.0763***
	(0.0326)	(0.0287)	(0.0416)	(0.384)	(0.0225)	(0.0273)	(0.0201)	(0.0148)	(0.0247)	(0.0241)
Pr[MALE=1|Somewhat Agree=1] - Pr[FEMALE=1|Somewhat agree=1]	-0.0166	-0.0211	-0.038	-0.0062	-0.0043	-0.0215	0.0057	-0.0055	0.027	-0.0059

Neutral										
MALE	0.474***	0.339***	0.367***	0.204	0.325***	0.384***	0.310***	0.255***	0.380***	0.370***
	(0.0327)	(0.0308)	(0.0304)	(1.972)	(0.0308)	(0.0318)	(0.0299)	(0.0286)	(0.0317)	(0.0316)
FEMALE	0.500***	0.383***	0.392***	0.240	0.337***	0.434***	0.293***	0.284***	0.329***	0.384***
	(0.0468)	(0.0487)	(0.0341)	(2.132)	(0.0542)	(0.0515)	(0.0523)	(0.0568)	(0.0543)	(0.0501)
Pr[MALE=1|Neutral=1] - Pr[FEMALE=1|Neutral=1]	-0.026	-0.044	-0.025	-0.036	-0.012	-0.05	0.017	-0.029	0.051	-0.014
Somewhat Disagree										
MALE	0.211***	0.265***	0.210***	0.180	0.231***	0.223***	0.184***	0.280***	0.224***	0.225***
	(0.0261)	(0.0284)	(0.0258)	(0.798)	(0.0270)	(0.0266)	(0.0244)	(0.0296)	(0.0265)	(0.0263)
FEMALE	0.194***	0.248***	0.182***	0.192	0.230***	0.205***	0.183***	0.284***	0.238***	0.220***
	(0.0348)	(0.0333)	(0.0335)	(0.573)	(0.0273)	(0.0316)	(0.0244)	(0.0302)	(0.0285)	(0.0298)
Pr[MALE=1|Somewhat disagree=1] - Pr[FEMALE=1|Somewhat disagree=1]	0.017	0.017	0.028	-0.012	0.001	0.018	0.001	-0.004	-0.014	0.005
Strongly Disagree										
MALE	0.204***	0.292***	0.236***	0.573	0.357***	0.297***	0.407***	0.420***	0.264***	0.287***
	(0.0260)	(0.0304)	(0.0274)	(3.331)	(0.0320)	(0.0301)	(0.0326)	(0.0336)	(0.0286)	(0.0295)
FEMALE	0.174***	0.233***	0.178***	0.514	0.340***	0.232***	0.433***	0.379***	0.337***	0.267***
	(0.0471)	(0.0564)	(0.0480)	(3.403)	(0.0697)	(0.0576)	(0.0767)	(0.0731)	(0.0716)	(0.0618)
Pr[MALE=1|Strongly disagree=1] - Pr[FEMALE=1|Strongly disagree=1]	0.03	0.059	0.058	0.059	0.017	0.065	-0.026	0.041	-0.073	0.02
Observations	273	273	273	273	273	273	273	273	273	273

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1