

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

This paper was submitted to a another journal from BMJ but declined for publication following peer review. The authors addressed the reviewers' comments and submitted the revised paper to BMJ Open. The paper was subsequently accepted for publication at BMJ Open.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Association between Socio-Ecological Factors and Electronic Cigarette Use Among Thai Youth: An Institution-Based Cross-sectional Study
AUTHORS	Seeherunwong, Acharaporn; Tipayamongkholgul, Mathuros; Angsukiattitavorn, Suleemas; Muangsakul, Wipanun; Singkhon, Onnalin; Junda, Sangdao; Sittichai, Ruthaychonnee; Ondee, Pasitta; Aekplakorn, Wichai

VERSION 1 – REVIEW

REVIEWER	Abdul Rahim, Hanan Qatar University, College of Health Sciences, Department of Public Health
REVIEW RETURNED	04-Jan-2023

GENERAL COMMENTS	<p>Thank you for the opportunity to review your manuscript. Please find below comments for your consideration. the majority are minor, but my concern is about the lack of weighting of prevalence estimates.</p> <p>Abstract:</p> <ul style="list-style-type: none">- define eligibility for the reader (age range and language requirement).- In the abstract and throughout the manuscript, it is best to use "conventional cigarettes" when not referring to ecigarettes or to dual use.- In the abstract and throughout the manuscript, the use of the term "school-based" is confusing, as the term usually does not include colleges, universities, and vocational institutions. Most "school-based" surveys refers to primary education (until grade 12). I recommend not using this term and refer to "institution-based" instead. <p>Key Messages:</p> <ul style="list-style-type: none">- In point 3: prevention and control of e-cigarette use should begin before university, as it appears from the data their use increases with age and from school to university. The prevention programs should address perceptions of harm, as indicated in key message 2.- The key points do not really clarify the addition that this study makes to the previous studies reported (references 15-17, two of
-------------------------	--

	<p>which are relatively recent). the contribution should be articulated more clearly.</p> <p>Study samples and sampling techniques: - Clarify please how sampling in universities and vocational colleges work compared to schools. How was one class chosen from those institutions?</p> <p>Research instruments and their performance: - Were there questions about other types of tobacco use (other than conventional and e-cigarettes)? This will help the international reader understand if there are unique tobacco products that may be equally or more prevalent to cigarettes with Thai youth. This is the case in other countries, where chewable or other types of smoked tobacco are common.</p> <p>Data collection and data analysis: - It is not clear how the gender categories were listed in the questionnaire. Did the questionnaire specifically ask about LGBTQ+ status or is it the researchers' the assumption that not identifying as male or female indicative of that status? The categories may not be mutually exclusive.</p> <p>Results: - Tables should include the confidence intervals referred to in the text. - Please be consistent with number of digits reported after the decimal points. -In table 2, what is the significance of reporting brands? are there differences in price? availability? -In table 2, what does "Introducing e-cigarette sources" mean?</p> <p>Discussion: - Region appears to be significantly associated with prevalence of cigarette and e-cigarette use. For the unfamiliar reader, more information on the regions (e.g. urbanism, socioeconomic conditions, demographic makeup etc) would be helpful to explain such differences. - Peer and family associations with ecigarette users emerge as the strongest factors associated with ecigarette use. However the implications of this finding for prevention and control efforts are not expanded on (compared to mentioning deceptive advertising for example, which respondents were not asked about).</p>
--	--

REVIEWER	Best, Catherine University of Stirling, School of Health Sciences
REVIEW RETURNED	24-Jan-2023

GENERAL COMMENTS	<p>Thank you for asking me to review this manuscript. It is a useful addition to the literature as it is good to know the prevalence of e-cigarette use among young people in a country where e-cigarette same and use is illegal. Past 30 day use of around 4% is high under these conditions.</p> <p>I have the following comments on the manuscript which would need to be addressed before it could be considered for publication</p> <p>1. Statistical issues. At Christmas the BMJ published 'On the 12th Day of Christmas, a Statistician Sent to Me . . .' a list of 12 common statistical concerns seen in research papers. The manuscript under review has two of these issues numbers seven and ten which are:</p>
-------------------------	---

	<p>a. Consideration of the need to account for clustering. The procedure involved complex survey design sampling at several nested levels: classrooms within educational establishments within regions. This needs to be accounted for within the analysis by for example using mixed effects models, GEE or calculation of cluster robust standard errors or include a justification of why this is not required. E.g. Neuhaus JM. Statistical methods for longitudinal and clustered designs with binary responses. <i>Stat Methods Med Res.</i> 1992;1(3):249-73. doi: 10.1177/096228029200100303. PMID: 1341660.</p> <p>b. Consideration of the variable selection approach. Riley et al say 'A common area of criticism in statistical reviews is the use of variable selection methods (eg, selection of covariates based on the statistical significance of their effects). If these methods are used, statistical editors will ask authors for justification.' The procedure used here is that independent variables were dropped from the model if they were not statistically significant this procedure needs justification. Riley R D, Cole T J, Deeks J, Kirkham J J, Morris J, Perera R et al. On the 12th Day of Christmas, a Statistician Sent to Me . . . <i>BMJ</i> 2022; 379 :e072883 doi:10.1136/bmj-2022-072883 and e.g. Austin PC, Tu JV. Automated variable selection methods for logistic regression produced unstable models for predicting acute myocardial infarction mortality. <i>J Clin Epidemiol.</i> 2004 Nov;57(11):1138-46. doi: 10.1016/j.jclinepi.2004.04.003. PMID: 15567629.</p> <p>2. E-cigarette ontology. The market around e-cigarettes is complex and constantly evolving. Table 2 contains 'tobacco heating products' as a type of e-cigarette. There is an argument for keeping these products separate as e-cigarettes usually involve heating a liquid whereas tobacco heating products involve the heating (but not combustion) of tobacco leaf. This issue is discussed in Cox, S, West, R, Notley, C, Soar, K, Hastings, J. Toward an ontology of tobacco, nicotine and vaping products. <i>Addiction.</i> 2023; 118(1): 177– 188. https://doi.org/10.1111/add.16010. It is also not discussed in this paper whether the e-cigarettes were nicotine containing.</p> <p>3. The graph in Figure 1B needs to have a title and labels on the x axis as it is not clear what this graph represents.</p> <p>4. For readers not familiar with this area of research it would be useful to explain what 'baraku' is and as it is presented as a type of e-cigarette whether this is e-baraku.</p> <p>5. Would it be possible to clarify what 'Introducing e-cigarette sources' means? Is this free samples?</p> <p>6. It would be useful to compare the frequencies of e-cigarette beliefs in table 3 between users and non-users rather than just to see the whole sample.</p> <p>7. The abstract says there were four regions studied but lists 5.</p>
--	---

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Hanan Abdul Rahim, Qatar University, College of Health Sciences

Comment 1:

Abstract

- define eligibility for the reader (age range and language requirement).

Response 1

Thank you very much for your comments, we added the eligible criteria in the revised abstract as presented in a revised version.

“An institution-based cross-sectional study was conducted in five regions: north, south, central, northeast, and Bangkok of Thailand from May to October 2021. An internet-based, anonymous self-administered questionnaire was developed based on the SEM and was sent to 13,139 students who understand Thai and voluntarily consented to participate in the study. Hierarchical generalized estimating equations (GEE) were used to identify the related factors to e-cigarette use in compliance with the SEM.”

Comment 2:

In the abstract and throughout the manuscript, it is best to use "conventional cigarettes" when not referring to e-cigarettes or to dual use.

Response 2

Thank you for your comments, after reviewing the updated ontology by Cox S et al, we decided to use term cigarettes, e-cigarettes and dual use in the revised abstract and main-text that presented in a revised version.

Cox S et al. defined cigarette as “a combustible tobacco-containing product that is a thin cylinder of finely cut tobacco encased in a thin paper” and e-cigarette as “an electronic vaping device that is hand held and produces for inhalation an aerosol formed by heating and e-liquid using a battery-powered heating coil”. Our research instrument, definition and choices of responses are well fitted with Cox’s report.

Ref: Cox, S, West, R, Notley, C, Soar, K, Hastings, J. Toward an ontology of tobacco, nicotine and vaping products. *Addiction*. 2023;118(1): 177– 188. <https://doi.org/10.1111/add.16010>.

Comment 3:

In the abstract and throughout the manuscript, the use of the term "school-based" is confusing, as the term usually does not include colleges, universities, and vocational institutions. Most "school-based" surveys refers to primary education (until grade 12). I recommend not using this term and refer to "institution-based" instead.

Response 3

Thank you for your comments, we corrected the term to institution-based in the revised abstract and presented in revised version.

Key Messages:

Comment 4

In point 3: prevention and control of e-cigarette use should begin before university, as it appears from the data their use increases with age and from school to university. The prevention programs should address perceptions of harm, as indicated in key message 2.

The key points do not really clarify the addition that this study makes to the previous studies reported (references 15-17, two of which are relatively recent). the contribution should be articulated more clearly.

Response 4

Thank you for your comments, we do agree with your opinion. We further analyzing and reviewing all findings again, we rewrote and add our key points into the discussion part as presented in the revised manuscript as follow:

This institution-based cross-sectional study revealed that Vocational schools, colleges and universities are high prevalence of e-cigarette use and this is likely related to the institutional social context and norm. Institution-based policy on e-cigarette ban should be reinforced in particular vocational school, university and colleges.

The probability of e-cigarette use is increased among youth that are closely connected with current e-cigarette users. The need to enhance e-cigarette health risk communication and preventative measures targeting the early age of youth is there. Peer learning programs that are against e-cigarettes should be integrated in the extra-curriculum of educational institutions. Additionally, this study found that the online markets is the major source of e-cigarette among youth. Media, information, digital literacy should be enhanced among early age youth. Finally, the government should provide an online innovative health risk communication about e-cigarette to balance misperception information about less harmful to health of e-cigarette.

Study samples and sampling techniques:

Comment 5

Clarify please how sampling in universities and vocational colleges work compared to schools. How was one class chosen from those institutions?

Response 5

Thank you so much for your inquiry. We selected one non-health science faculty and included all students in the faculty. The research coordinator sent the QR code of the internet-based anonymous self-administered questionnaire to all class students in the faculty to ensure all students voluntarily agreed to participate in the survey. We also added the information to make our sampling technique much clearer for all readers and presented in a revision as following”

A two-stage stratified cluster sampling method was used to select a sample of youth. In Thailand, not all provinces have universities or colleges. Therefore, we purposively chose two provinces from each region with universities or colleges in the first step. Then, we randomly selected two high schools, two vocational schools, and one university or college (if there were more than one university or college in the province) from the selected provinces. Finally, we randomly selected one class from each grade of the chosen educational institution and included all students in that class. For college and university, we randomly selected one non-health science faculty and included all students of that faculty. We obtained consent from the parents or guardians of all students who were aged <18 years chosen before sending the internet-based anonymous self-administered questionnaire to the students. The QR code of the internet-based anonymous self-administered questionnaire was disseminated to all students to ensure all students voluntarily agreed to participate in the survey.

Research instruments and their performance:

Comment 6:

- Were there questions about other types of tobacco use (other than conventional and e-cigarettes)?

This will help the international reader understand if there are unique tobacco products that may be equally or more prevalent to cigarettes with Thai youth. This is the case in other countries, where chewable or other types of smoked tobacco are common.

Response

Thank you so much for your advice, however, we had only three choices of tobacco use i.e. conventional, e-cigarettes and both, and asked about brands of e-cigarettes. Although, in southern part of Thailand, Baraku, a tobacco water-pipe types, is also used among youth, we did not include it in the revised version because it is found in particular group of youth.

Data collection and data analysis:

Comment 7:

It is not clear how the gender categories were listed in the questionnaire. Did the questionnaire specifically ask about LGBTQ+ status or is it the researchers' the assumption that not identifying as male or female indicative of that status? The categories may not be mutually exclusive.

Response 7

Yes, for gender status, there are three choices of answer, Male, Female and LGBTQ+. Therefore, respondents can indicate their gender as Male, Female or LGBTQ+.

Results:

Comment 8:

Tables should include the confidence intervals referred to in the text.

Response 8

Thank you so much. We added and rechecked the consistency of information on the table and text.

Comment 9: Please be consistent with number of digits reported after the decimal points.

Response 9

Thank you so much for your kind notices. We double checked and corrected all digits to make it consistency throughout the manuscript.

Comment 10:

In table 2, what is the significance of reporting brands? are there differences in price? availability?

Response 10

Thank you so much, we reconsider and decided to delete this part from our revised manuscript but kept presenting the types and pattern of use among current e-cigarette users to provide insightful information about the availability types of e-cigarette and indicate addiction of current e-cigarette users.

Comment 11:

In table 2, what does "Introducing e-cigarette sources" mean?

Response 11

We decided to change the introducing e-cigarette sources to referral marketing for better understanding. It is actually the referral market which is the word-of-mouth-market that youth know vendors from friend or social media to recommend the sources of e-cigarette purchasing.

Discussion:

Comment 12

Region appears to be significantly associated with prevalence of cigarette and e-cigarette use. For the unfamiliar reader, more information on the regions (e.g. urbanism, socioeconomic conditions, demographic makeup etc.) would be helpful to explain such differences.

Response 12

We re-analyzed using GEE to take cluster specific errors into account (educational institution) and found non-significant effects of regions. However, five regions are different based on culture, norm and socioeconomic condition. Northern part is the mountainous area and tourism-based economy that have strong patriarchy system compares to other regions. Also, cigarette use is common among male youth to express their adulthood. It might relate with tourism-based economy, availability of popular stuffs such as e-cigarette can likely be found in this area.

Bangkok is the capital city where accessibility to online marketing is higher than other areas, also the gathering area of youth from other regions of Thailand. Also, socialization and youth gathering area are more prevalence.

Southern and northeastern are more agricultural-based economy therefore life-styles and norm are quite different from north and Bangkok region.

Comment 13 Peer and family associations with e-cigarette users emerge as the strongest factors associated with e-cigarette use. However, the implications of this finding for prevention and control efforts are not expanded on (compared to mentioning deceptive advertising for example, which respondents were not asked about).

Response

Thank you so much. We do agree with you that the public health implications are not well linked with the findings. We rewrote the conclusion, discussion, prevention and control effort in the abstract, discussion and conclusion. The revision presented in the revised manuscript.

This institution-based cross-sectional study revealed that e-cigarettes are a crucial problem. An e-cigarette ban policy in academic institution should be reinforced in particular vocational schools, universities and colleges. Peer learning to fight e-cigarette use among early age youth should be implemented in educational institution. Empowering critical thinking programs among youth about online information should be continually operated in educational institutions.

Reviewer: 2

Dr. Catherine Best, University of Stirling

I have the following comments on the manuscript which would need to be addressed before it could be considered for publication

Comment 1:

1. Statistical issues. At Christmas the BMJ published 'On the 12th Day of Christmas, a Statistician Sent to Me . . .' a list of 12 common statistical concerns seen in research papers. The manuscript under review has two of these issues numbers seven and ten which are:

a. Consideration of the need to account for clustering. The procedure involved complex survey design sampling at several nested levels: classrooms within educational establishments within regions. This needs to be accounted for within the analysis by for example using mixed effects models, GEE or calculation of cluster robust standard errors or include a justification of why this is not required. E.g. Neuhaus JM. Statistical methods for longitudinal and clustered designs with binary responses. *Stat Methods Med Res.* 1992;1(3):249-73. doi: 10.1177/096228029200100303. PMID: 1341660.

b. Consideration of the variable selection approach. Riley et al say 'A common area of criticism in statistical reviews is the use of variable selection methods (eg, selection of covariates based on the statistical significance of their effects). If these methods are used, statistical editors will ask authors for justification.' The procedure used here is that independent variables were dropped from the model if they were not statistically significant this procedure needs justification. Riley R D, Cole T J, Deeks J, Kirkham J J, Morris J, Perera R et al. On the 12th Day of Christmas, a Statistician Sent to Me . . . *BMJ* 2022; 379 :e072883 doi:10.1136/bmj-2022-072883 and e.g.

Austin PC, Tu JV. Automated variable selection methods for logistic regression produced unstable models for predicting acute myocardial infarction mortality. *J Clin Epidemiol.* 2004 Nov;57(11):1138-46. doi: 10.1016/j.jclinepi.2004.04.003. PMID: 15567629.

Response1:

Thank you so very much, your comments and inquiries provided an opportunity to improve our manuscript. We reanalyzed our data using generalized estimating equation to take cluster sampling

into account. Our revised manuscript presented adjusted odds ratio from GEE. Also, we applied socio-ecological model to identify effects of factors in each level of the model and literatures, we therefore kept our analysis follow the model rather than selected variables based on p-value. Detailed analysis and revision presented in revised manuscripts as red color fonts.

However, our limitation remained with the prevalence estimation because we did not have the sampling probability at each level due to lack of population information. Although, our e-cigarette prevalence is likely underestimating among youth, the prevalence remains crucial for public health implication. Also, in Thailand all formal education institution must comply with the educational system standard of the Ministry of Education, therefore, the characteristics of educational institution in certain types are similar across region.

Comment 2:

2. E-cigarette ontology. The market around e-cigarettes is complex and constantly evolving. Table 2 contains 'tobacco heating products' as a type of e-cigarette. There is an argument for keeping these products separate as e-cigarettes usually involve heating a liquid whereas tobacco heating products involve the heating (but not combustion) of tobacco leaf. This issue is discussed in Cox, S, West, R, Notley, C, Soar, K, Hastings, J. Toward an ontology of tobacco, nicotine and vaping products. *Addiction*. 2023; 118(1): 177– 188. <https://doi.org/10.1111/add.16010>. It is also not discussed in this paper whether the e-cigarettes were nicotine containing.

Response 2:

Thank you so much for introducing the article to us. In our study, e-cigarette refers to the nicotine containing e-cigarette. We however deleted baraku and tobacco heating products which are not aligned with the e-cigarette's definition.

Comment 3

The graph in Figure 1B needs to have a title and labels on the x axis as it is not clear what this graph represents.

Response 3

Thank you so much. We do agree with you and changed our presentation.

Comment 4.

For readers not familiar with this area of research it would be useful to explain what 'baraku' is and as it is presented as a type of e-cigarette whether this is e-baraku.

Response 4:

Although, in southern part of Thailand, Baraku, a tobacco water-pipe types, is also used among youth, we did not include it in the revised version because it is found in certain area. Additionally, the e-Baraku is not well recognized in Thailand, therefore Baraku is excluded from our re-analysis.

Comment 5.

Would it be possible to clarify what 'Introducing e-cigarette sources' means? Is this free samples?

Response 5

It is actually the referral market which is the word-of-mouth-market that youth know vendors from friend or social media to recommend the sources of e-cigarette purchasing. We changed the term in our revised manuscript from introducing e-cigarette to referral market.

Comment 6.

It would be useful to compare the frequencies of e-cigarette beliefs in table 3 between users and non-users rather than just to see the whole sample.

Response 6

Thank you so much, we agreed with your advice and re-analyzed our data. The revision presented in table 4.

Comment 7.

The abstract says there were four regions studied but lists 5.

Response 7

Thank you so much. We corrected all typo and made all statements consistency.

VERSION 2 – REVIEW

REVIEWER	Abdul Rahim, Hanan Qatar University, College of Health Sciences, Department of Public Health
REVIEW RETURNED	31-Mar-2023

GENERAL COMMENTS	<p>Thank you for addressing the comments of both reviewers in the revised version of the manuscript.</p> <p>Please find below some minor edits /comments:</p> <ol style="list-style-type: none"> 1. Abstract <ol style="list-style-type: none"> 1.1. In the Objectives (page 4 line 55), I suggest to rephrase "to determine factors associated with the socio-ecological model (SEM) of e-cigarette use among Thai youth" INTO " to determine factors of the socio-ecological model (SEM) that are associated with e-cigarette use....." 1.2. Use the past-tense consistently to report results 1.3 Rephrase "Factors at interpersonal and school levels stronger associated with e-cigarette use among youth than factors at the intrapersonal level" 1.4 The conclusion "An e-cigarette ban policy in academic institution should be reinforced in particular vocational schools, universities and colleges" is not particularly relevant to the findings. E-cigarettes are illegal in Thailand, and yet youth are able to access them, as the paper states. As such, the conclusions need to be made more relevant to the findings regarding availability in grocery stores and through online markets (i.e. the supply side). 2. Results: <ol style="list-style-type: none"> 2.1 Change title of table1 from "Characteristics of Respondents and Percentage of Current Cigarette Users " INTO "Prevalence of cigarette, e-cigarette, and dual use by Respondent Characteristics" 2.2 In table 2, it is confusing to use "dual use" when referring to using e-cigarettes with other substances, since the term "dual use" had been previously used to refer to using cigarettes and e-cigarettes. Suggest to use "substances consumed with e-cigarettes" or other label. 2.3 Also in table,2, the label "Use of e-cigarettes concerning regular cigarettes" is not clear. Suggest re-phrasing to "effect of e-cigarette use on cigarette use" or something similar. 2.4 Supplementary Table 2 should be a main table in the paper, since it addresses one of the stated objectives.
-------------------------	---

	3. Conclusion: As with comment 1.4, addressing supply side of e-cigarettes would be a good addition to the conclusion, given the results.
--	--

REVIEWER	Best, Catherine University of Stirling, School of Health Sciences
REVIEW RETURNED	11-Apr-2023

GENERAL COMMENTS	<p>Thank you for asking me to review the revised version of the manuscript 'Characteristics of Cigarette Use and Factors Associated with Electronic Cigarette Use Among Thai Youth'. The revised version has addressed all my previously comments very well. There are a couple of very minor comments I would like to make on the revised version.</p> <p>In the results section of the abstract the text states 'Having ties with e-cigarette users increased probability of e-cigarette use among respondents by 3.2 times'. This refers I believe to the odds ratio of 3.239 in supplementary table 2 for 'E-cigarette users in relationship' - 'Girlfriend and boyfriend'. I would recommend firstly, to state exactly which relationship this refers to ie having a girlfriend or boyfriend who uses e-cigarettes and secondly this is an odds ratio, so saying it increases the probability by 3.2 times is not quite right – it increases the odds by 3.2 times. This is reported very well in the results section where the authors state 'We found having a girlfriend or boyfriend who uses e-cigarettes increased the odds of e-cigarette use by 3.239 times, while close friends increased the odds of e-cigarette use by 2.789 times'. I would change the abstract to the same wording as you have used in the main text.</p> <p>In addition, I don't think you can directly compare the odds ratios for the different independent variables in the GEE as they are not standardised. That is, in the abstract where it states 'Factors at interpersonal and school levels stronger associated with e-cigarette use among youth than factors at the intrapersonal level.' Although looking at supplementary table 2 I broadly agree with you -I'm not sure you can draw that conclusion definitely from just the odds ratios as the scales of the variables are different. So while the odds ratio of exposure to e-cigarette use in school/ college has an OR of 4 meaning the odds of e-cig use are 4 times higher in someone who reports e-cigarette use in school compared to someone who does not (all else held constant) this can't be directly compared to the OR for beliefs about e-cigs. This is because the variable positive attitude towards e-cigarettes is a continuous measure with a mean of about 30 and standard deviation of 9 or so. So even though the odds ratio for beliefs about e-cigs is smaller at about 1.05 this is a 5% increase in the odds for each 1 point increase in score for 'beliefs about e-cigarettes' and the range for these scores is large.</p> <p>There are some minor typographical errors e.g. Suggest replace 'Bangkok of Thailand ' with 'Bangkok area of Thailand'</p> <p>Under research instruments 'availability of e-cigaretteanning signs' replace with 'signs prohibiting e-cigarettes'.</p> <p>In results 'Youth in northern region higher reported a higher' replace with 'Youth in northern region reported a higher'.</p> <p>Table 1 in the row for 'High School' 1.3 (0.9-1.0) the 95% CI does not contain the point estimate.</p>
-------------------------	--

VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Dr. Hanan Abdul Rahim, Qatar University, College of Health Sciences

Comment1

In the Objectives (page 4 line 55), I suggest to rephrase "to determine factors associated with the socio-ecological model (SEM) of e-cigarette use among Thai youth" INTO " to determine factors of the socio-ecological model (SEM) that are associated with e-cigarette use....."

Response 1

Thank you so much. We revised our revised the objective section in abstract part as presented in a revised version.

"This study aimed to examine cigarette use distribution, the pattern of e-cigarette use, and to determine factors of the socio-ecological model (SEM) that are associated with e-cigarette use among Thai youth (aged 15-24)."

Comment 2

Use the past-tense consistently to report results

Response 2

Thank you, we corrected the result section in the revised abstract to past tense followed your suggestions.

Comment 3

Rephrase "Factors at interpersonal and school levels stronger associated with e-cigarette use among youth than factors at the intrapersonal level"

Response 3

Thank you so much. We revised the result section in the revised abstract as follow

"We found having a girlfriend or boyfriend who uses e-cigarettes increased the odds of e-cigarette use by 3.239 times. Interestingly, peer users presented higher odds of e-cigarette use in youth than having siblings use e-cigarette (Adj. OR 2.789, 95% CI: 1.844-4.208 and 2.475, 95% CI: 1.402-4.404, respectively). Exposure to e-cigarette use in school increase odds of e-cigarette use by 4 times."

Comment 4

The conclusion "An e-cigarette ban policy in academic institution should be reinforced in particular vocational schools, universities and colleges" is not particularly relevant to the findings. E-cigarettes are illegal in Thailand, and yet youth are able to access them, as the paper states. As such, the conclusions need to be made more relevant to the findings regarding availability in grocery stores and through online markets (i.e. the supply side).

Response 4

Thank you, we revised the conclusion section in the revised abstract as follow:

"This institution-based cross-sectional study revealed that e-cigarettes are a crucial problem. An e-cigarette ban should be reinforced through online markets and grocery stores. Peer learning to fight e-cigarette use and empowering critical thinking programs about online information among early age youth should continually operate in educational institutions."

Comment on result part

Comment 4

Change title of table1 from "Characteristics of Respondents and Percentage of Current Cigarette Users " INTO "Prevalence of cigarette, e-cigarette, and dual use by Respondent Characteristics"

Response 4

Thank you. We change the title of the table 1 to "Prevalence of cigarette, e-cigarette, and dual use by

Respondent Characteristics"

Comment 5

In table 2, it is confusing to use "dual use" when referring to using e-cigarettes with other substances, since the term "dual use" had been previously used to refer to using cigarettes and e-cigarettes. Suggest to use "substances consumed with e-cigarettes" or other label.

Response 5

Thank you. We revised the dual use to "substances consumed with e-cigarettes" as presented in table 2 of the revised manuscript.

Comment 6 Also in table,2, the label "Use of e-cigarettes concerning regular cigarettes" is not clear. Suggest re-phrasing to "effect of e-cigarette use on cigarette use" or something similar.

Response 6

Thank you. We revised the dual use to "effect of e-cigarette use on cigarette use" as presented in table 2 of the revised manuscript.

Comment 7

Supplementary Table 2 should be a main table in the paper, since it addresses one of the stated objectives.

Response 7

Thank you, we agreed we revised supplementary table 2 and presented in the revised version as table 4 in the main text.

Comment on the conclusion section

Comment 8

As with comment 1.4, addressing supply side of e-cigarettes would be a good addition to the conclusion, given the results.

Response 8

Thank you, we revised the conclusion section in the main text as following "Additionally, this study found that the online markets is the major source of e-cigarette among youth. Media, information, digital literacy should be enhanced among early age youth. Finally. the government should provide an online innovative health risk communication about e-cigarette to balance misperception information about less harmful to health of e-cigarette, and to reinforce e-cigarette ban and regulations through online markets and grocery stores"

Reviewer: 2

Dr. Catherine Best, University of Stirling

Comment 1

In the results section of the abstract the text states 'Having ties with e-cigarette users increased probability of e-cigarette use among respondents by 3.2 times'. This refers I believe to the odds ratio of 3.239 in supplementary table 2 for 'E-cigarette users in relationship' -'Girlfriend and boyfriend'. I would recommend firstly, to state exactly which relationship this refers to ie having a girlfriend or boyfriend who uses e-cigarettes and secondly this is an odds ratio, so saying it increases the probability by 3.2 times is not quite right – it increases the odds by 3.2 times. This is reported very well in the results section where the authors state 'We found having a girlfriend or boyfriend who uses e-cigarettes increased the odds of e-cigarette use by 3.239 times, while close friends increased the odds of e-cigarette use by 2.789 times'. I would change the abstract to the same wording as you have used in the main text.

Response 1

Thank you. We revised the result part in abstract follow your suggestion in our revised manuscript as follow "We found having a girlfriend or boyfriend who uses e-cigarettes increased the odds of e-cigarette use by 3.239 times. Interestingly, peer users presented higher odds of e-cigarette use in youth than having siblings use e-cigarette (Adj. OR 2.789, 95% CI: 1.844-4.208 and 2.475, 95% CI: 1.402-4.404, respectively). Exposure to e-cigarette use in school increase odds of e-cigarette use by 4 times."

Comment 2

In addition, I don't think you can directly compare the odds ratios for the different independent variables in the GEE as they are not standardised. That is, in the abstract where it states 'Factors at interpersonal

and school levels stronger associated with e-cigarette use among youth than factors at the intrapersonal level.' Although looking at supplementary table 2 I broadly agree with you -I'm not sure you can draw that conclusion definitely from just the odds ratios as the scales of the variables are different. So while the odds ratio of exposure to e-cigarette use in school/ college has an OR of 4 meaning the odds of e-cig use are 4 times higher in someone who reports e-cigarette use in school compared to someone who does not (all else held constant) this can't be directly compared to the OR for beliefs about e-cigs. This is because the variable positive attitude towards e-cigarettes is a continuous measure with a mean of about 30 and standard deviation of 9 or so. So even though the odds ratio for beliefs about e-cigs is smaller at about 1.05 this is a 5% increase in the odds for each 1 point increase in score for 'beliefs about e-cigarettes' and the range for these scores is large.

Response 2

Thank you so much for your suggestion and constructive comment. We agreed with you and decided to revised the result section of the abstract in relation to the intrapersonal and interpersonal factors as follow"

Comment 3

There are some minor typographical errors e.g.

Suggest replace 'Bangkok of Thailand ' with 'Bangkok area of Thailand'

Under research instruments 'availability of e-cigaretteannning signs' replace with 'signs prohibiting e-cigarettes'.

Response 3

Thank you so much, we thoroughly replaced availability of e-cigarette banning signs' with signs prohibiting e-cigarettes in school'.

Comment 4

In results 'Youth in northern region higher reported a higher' replace with 'Youth in northern region reported a higher'.

Response 4

Thank you, we replaced the term accordingly.

Comment 5

Table 1 in the row for 'High School' 1.3 (0.9-1.0) the 95% CI does not contain the point estimate.

Response 5

Thank you we corrected the table accordingly.

VERSION 3 – REVIEW

REVIEWER	Abdul Rahim, Hanan Qatar University, College of Health Sciences, Department of Public Health
REVIEW RETURNED	03-Jun-2023
GENERAL COMMENTS	thank you for addressing my comments and the comments of the second reviewer.
REVIEWER	Best, Catherine University of Stirling, School of Health Sciences
REVIEW RETURNED	07-Jun-2023
GENERAL COMMENTS	Thank you for asking me to review this revised manuscript. There are only a couple of minor points outstanding. Abstract says 'Although, the usage of e-cigarettes is illegal in Thailand, almost 70% of users obtained e-cigarettes from online markets and 4% from grocery stores.' Text in the results section says 'About 66% bought e-cigarettes from the online market'. It

	<p>would be better if these match – and I think its best to be as precise as possible ie 66% better than ‘almost 70%’.</p> <p>Consider replacing ‘E-cigarette users have significant higher mean score of knowledge about e-cigarette legislation’ with ‘E-cigarette users have significantly higher mean scores related to knowledge about e-cigarette legislation’.</p> <p>In the methods consider replacing ‘Then, we examined the reliability of the internet questionnaire and found that all sections had a Cronbach's Alpha from 0.79-0.85’ with ‘Then, we examined the reliability of the internet questionnaire and found that the novel measures of e-cigarette knowledge and awareness of e-cigarette legislation had a Cronbach's Alpha from 0.79-0.85.’ Cronbach’s alpha assesses whether all items in a scale measure the same underlying construct. That is, the level agreement between items on a scale. This would not apply to all sections of the questionnaire. For example, if you are asking young people what their age is and then whether they have used e-cigarettes these two questions are not part of the same construct and therefore you would not expect them to have a high Cronbach alpha. The same with questions about where they accessed e-cigarettes -it is valid for their answers to whether they bought e-cigs online, in shops of other sources to vary completely independently that is, they do not nor should have, inter item reliability.</p> <p>In line 30 of the discussion the text says ‘Surprisingly, more than 70% of respondents accepted that smoking in public spaces is illegal, but e-cigarette use in schools was still reported.’ Would it be better to report how many thought e-cigarette use in public was illegal here rather than cigarette use as the next point made is that e-cigarette use is still occurring in schools.</p> <p>The discussion starts with ‘This school-based cross-sectional study’ when everywhere else has been revised to ‘institutional based’ as not all are schools.</p>
--	---

VERSION 3 – AUTHOR RESPONSE

Comment from the Reviewer: 1

Dr. Hanan Abdul Rahim, Qatar University, College of Health Sciences

Comments to the Author:

thank you for addressing my comments and the comments of the second reviewer.

Response:

Thank you for your previous comments that help us to improve a better version of our manuscript.

Comment from the Reviewer: 2

Dr. Catherine Best, University of Stirling

Comments to the Author:

Thank you for asking me to review this revised manuscript. There are only a couple of minor points outstanding.

1. Abstract says ‘Although, the usage of e-cigarettes is illegal in Thailand, almost 70% of users obtained e-cigarettes from online markets and 4% from grocery stores.’ Text in the results section says ‘About 66% bought e-cigarettes from the online market’. It would be better if these match – and I think its best to be as precise as possible ie 66% better than ‘almost 70%’.

Consider replacing ‘E-cigarette users have significant higher mean score of knowledge about e-cigarette legislation’ with ‘E-cigarette users have significantly higher mean scores related to knowledge about e-cigarette legislation’.

Response:

Thank you so much for your kind suggestions and explanation. We do agree with you that using the exact number is much clearer than the subjective term. We therefore revised the result part of our revised manuscript

“ Although the use of e-cigarettes is illegal in Thailand, 66% of users obtained e-cigarettes from online markets and 4% from grocery stores.”

“E-cigarette users have significantly higher mean scores related to knowledge about e-cigarette legislation than non-users (Mean=5.58, SD=2.55 VS Mean=5.01, SD=2.87, respectively), but have a significantly greater positive attitude and belief towards e-cigarettes than non-users (Table 3).”

2. In the methods consider replacing ‘Then, we examined the reliability of the internet questionnaire and found that all sections had a Cronbach's Alpha from 0.79-0.85’ with ‘Then, we examined the reliability of the internet questionnaire and found that the novel measures of e-cigarette knowledge and awareness of e-cigarette legislation had a Cronbach's Alpha from 0.79-0.85.’ Cronbach's alpha assesses whether all items in a scale measure the same underlying construct. That is, the level agreement between items on a scale. This would not apply to all sections of the questionnaire. For example, if you are asking young people what their age is and then whether they have used e-cigarettes these two questions are not part of the same construct and therefore you would not expect them to have a high Cronbach alpha. The same with questions about where they accessed e-cigarettes -it is valid for their answers to whether they bought e-cigs online, in shops of other sources to vary completely independently that is, they do not nor should have, inter item reliability.

Response:

Thank you so much for your comments. We revised the methods part follow your suggestion “Then, we examined the reliability of the internet questionnaire and found that the novel measures of e-cigarette knowledge and awareness of e-cigarette legislation had a Cronbach's Alpha from 0.79-0.85. The complete questionnaire is provided in supplement file 1.”

3. In line 30 of the discussion the text says ‘Surprisingly, more than 70% of respondents accepted that smoking in public spaces is illegal, but e-cigarette use in schools was still reported.’ Would it be better to report how many thought e-cigarette use in public was illegal here rather than cigarette use as the next point made is that e-cigarette use is still occurring in schools.

Response:

Yes, we do agree with you and revised the discussion part follow your suggestion.

“Surprisingly, more than 70% of respondents accepted that e-smoking in public spaces is illegal, but e-cigarette use in schools was still reported.”

4. The discussion starts with ‘This school-based cross-sectional study’ when everywhere else has been revised to ‘institutional based’ as not all are schools.

Response:

Thank you, we corrected the term in our revised version. “This institution-based cross-sectional study found that the prevalence of current use of exclusive cigarettes was 4.3%, exclusive e-cigarette use was 3.4%, and dual-use was 2.4%.”