

Perceptions of E-Cigarette Use as Means for Smoking Cessation among Selected E-Cigarette Users in Iligan City

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Abstract:-

➤ *Background and Aim*

Understanding users' perspectives, duration of use, and stages of change related to smoking cessation is crucial for informing effective interventions.

➤ *Design*

We employed a correlational design and used questionnaires to collect data from 120 e-cigarette users in Iligan City. Respondents were divided into two groups based on smoking cessation stage categories: action and maintenance.

➤ *Results*

Respondents generally held positive views of e-cigarettes as a smoking cessation tool. Nearly 30% of the users transitioned from traditional cigarettes to e-cigarettes within six months. More than half of the respondents were actively taking steps to quit (action stage), while almost 46% had successfully quit and were in the maintenance stage. The study found no significant association between the perceptions of e-cigarette use as a tool for smoking cessation and the stage of change in smoking cessation, as well as between the duration of e-cigarette use and the stage of change in smoking cessation.

➤ *Conclusion*

Even if our findings suggest that perceptions on e-cigarette smoking and duration of e-cigarette use showed no significant association with smoking cessation stages of change, respondents revealed a leap by taking actions to quit traditional smoking.

Keywords:- E-Cigarettes, Smoking Cessation, Perceptions, Duration of Use, Stages of Change, Public Health.

I. INTRODUCTION

There appears to be an increased use of e-cigarettes globally. In Great Britain, the number of young adults aged 18-24 using e-disposables has surged, jumping from 1.8% to a striking 6.7% among a group of 36,876 individuals (Tattan-Birch et al. 2022). E-cigarette use is different among various racial and ethnic groups. For instance, 28% of Native Hawaiian and Pacific Islander youth (n = 42,980) reported the highest levels of use (Do et al. 2023). Meanwhile, in 2019, 14.1% of Filipino Teenagers were reported to be using e-cigarettes (Puyat et al. 2023).

Diverse e-cigarette uses among students and a surprising drop in smoking rates suggest that e-cigarettes are declining in popularity. Among 14,532 European students, regular e-cigarette use varied, with 2.3% of students in Slovakia using them compared to 4% in Russia (Brožek et al. 2019). Additionally, smoking rates from 2013-2019 were much lower than experts had expected. This gap between actual and predicted smoking rates became even more noticeable as e-cigarette use went up (Foxon et al. 2022).

Many studies show that people's perceptions of e-cigarettes and their addictiveness are influencing their growing use. For example, one study found that non-nicotine and flavored e-cigarettes are often seen as less harmful than those with nicotine (Thoonen and Jongenelis 2023). Young adults tend to think that e-cigarettes and their vapors are less damaging, less addictive, and not as common as traditional cigarettes (Jiang et al. 2019). Similarly, many adult smokers don't believe that e-cigarettes have fewer harmful chemicals than regular cigarettes (Wackowski et al. 2023). Additionally, a significant number of people think that vaping isn't harmful to children or pregnant women and believe it's not addictive (Abdel Qader and Al Meslamani 2020).

More importantly, many people turn to e-cigarettes to help them quit smoking. Often, they experiment with different flavors to find what works best for them (Lindson et al. 2022). However, a study found that less than half of the 1007 college students surveyed actually used e-cigarettes as a tool to stop smoking (Qanash et al. 2019). Interestingly, e-cigarettes have been shown to be more effective than traditional nicotine replacement therapies, especially for achieving long-term smoking reduction and cessation with little extra support (Myers-Smith et al. 2021).

However, using e-cigarettes does come with health risks. In 2019, there was a notable increase in lung injuries linked to e-cigarette or vaping product use in the United States, resulting in over 2800 hospitalizations. Additionally, electronic nicotine delivery systems (ENDS), especially those with nicotine, have immediate effects on the body. Healthcare professionals strongly advise against using e-cigarettes and vaping products, recommending traditional tobacco cessation methods to prevent people from starting to use e-cigarettes in the first place (Rose et al. 2023).

The perceptions of e-cigarette users and their addictiveness significantly influence their rising popularity. Non-nicotine and flavored e-cigarettes are often seen as less harmful than those with nicotine (Thoonen and Jongenelis 2023). Many use e-cigarettes to quit smoking (Qanash et al. 2019). However, despite being used for smoking cessation, e-cigarettes still carry health risks (Rose et al. 2023). There's a need for more research on how different perceptions of e-cigarette users affect their lives and how often they use these products.

Hence, this study addressed this knowledge gap by exploring the perspective of e-cigarette use as a means of smoking cessation, duration of smoking cessation efforts, and stage of change in smoking cessation. This could provide valuable insights for developing effective strategies for tobacco cessation and the prevention of e-cigarette use in Iligan City. The research questions were as follows.

- What are the perceptions of e-cigarette users in Iligan City on using e-cigarettes for smoking cessation?
- What is the duration of e-cigarette use as a smoking cessation tool among users in Iligan City?
- In what stage of change does the respondent belong to in smoking cessation?
- Is there a significant relationship between the perceptions of e-cigarette use as a means for smoking cessation, usage patterns, and stage of change in smoking cessation among respondents?

II. METHODS

➤ *Research Design*

The selected research design was descriptive correlational, allowing us to explore the relationship between the three variables without implying cause-and-effect. The researcher examined the respondents' perceptions of e-cigarette use as a tool for quitting, duration of use, and stage of change in smoking cessation efforts. This included investigating whether perceptions of e-cigarettes as a cessation aid and duration of use are associated with stage of change in smoking cessation. (Bhat 2023).

➤ *Population and Sample*

The study population comprised e-cigarette users residing in Iligan City, the Philippines. The convenience sampling method consisted of 120 people who had at least smoked 100 cigarettes and were using e-cigarettes as a tool for smoking cessation selected based on specific characteristics that were relevant to the study (Polit and Beck 2022).

➤ *Instrumentation/Tools*

The E-cigarette Use Assessment Tool questionnaire (Cronbach's alpha = 0.77) assessed the participants' perceptions of e-cigarette use, including their beliefs about the effectiveness of e-cigarettes as a smoking cessation tool (Frost 2024). The E-cigarette Usage Duration in Smoking Cessation Efforts Questionnaire assessed the duration of e-cigarette use in smoking cessation efforts. The researchers did not report any pilot testing for this instrument. Pilot testing may not be essential for collecting factual objective measures, such as duration in self-reported health data (Hoyle 2014). The participants' stages of change in smoking cessation were assessed (Cronbach's alpha = 0.93 and a Kappa coefficient of 0.79) using the Assessing "Stage of Change" in Current and Former Smokers Questionnaire (Etter and Sutton 2002).

➤ *Ethical Considerations*

Ethical standards were maintained by obtaining informed consent from all participants. The confidentiality and anonymity of participants were maintained, and the collected data were used solely for research purposes overseen by the Dean of the School of Nursing at the Adventist Medical Center College to ensure compliance with institutional ethical standards. This study was approved by the Ethics Review Committee of the Adventist Medical Center College.

➤ *Data Gathering Procedure*

The steps taken to gather data from the respondents were as follows.

After obtaining informed consent, the research team recruited participants who had smoked at least 100 cigarettes in their lifetime and used e-cigarettes to quit smoking. Questionnaires were then distributed, including the E-cigarette Use Assessment Tool, the E-cigarette Usage Duration in Smoking Cessation Efforts Questionnaire, and the Assessing Stage of Change in Current and Former Smokers questionnaire. Ample time was provided for completion, with assistance provided if needed. Once completed, the questionnaires were collected to ensure completeness before the data were prepared for analysis.

➤ *Data Analysis*

Using SPSS version 25, data were analyzed as follows. Raw data were entered and cleaned in Microsoft Excel, checking for errors, inconsistencies, and missing data. Once cleaned, the data were imported into IBM SPSS. Before conducting specific statistical tests, the researchers assessed the normality of continuous variables to ensure the data distribution was suitable for the chosen tests. For Research Question 1, on e-cigarette users' perceptions of their effectiveness for smoking cessation, means and standard deviations were calculated. For Research Question 2, on the duration of smoking cessation efforts, percentages and

frequencies were used. For Research Question 3, on the stage of change in smoking cessation, percentages and frequencies were also employed. For Research Question 4, examining the correlation between perceptions, usage patterns, and stages of change, the Kruskal-Wallis H and Chi-square tests were applied.

III. RESULTS

The respondents were e-cigarette users living in Iligan City, Philippines. A total of 120 respondents were chosen based on specific criteria relevant to the study. They have smoked at least 100 cigarettes in their lifetime and are currently using e-cigarettes to quit smoking. This selection process ensured that the respondents' experiences and perspectives were particularly pertinent to the study's focus.

Table 1 shows that the respondents in Iligan City generally held positive views on e-cigarettes as a smoking cessation tool. The average score across all five statements landed around 3.2, with the highest mean (3.45) showing a strong agreement with e-cigarettes to help them resist the urge to smoke traditional cigarettes. These results suggest that e-cigarettes helped reduce their overall consumption of traditional cigarettes and were perceived as a valuable tool in reducing and quitting traditional cigarette smoking, particularly in managing cravings and supporting cessation efforts.

Table 1 Descriptive Stats of Perceptions of E-Cigarette Use as a Smoking Cessation Tool

	<i>M ± SD</i>	<i>Interpretation</i>
1. E-cigarettes have helped me to reduce the number of traditional cigarettes I smoke.	3.02 ± 0.93	Agree
2. E-cigarettes are an effective tool for quitting smoking.	3.42 ± 0.68	Strongly Agree
3. Using e-cigarettes made it easier for me to resist the urge to smoke traditional cigarettes.	3.45 ± 0.58	Strongly Agree
4. I have successfully quit smoking traditional cigarettes by using e-cigarettes.	2.87 ± 0.79	Agree
5. I would recommend e-cigarettes to others trying to quit smoking.	3.13 ± 0.85	Agree
Total	3.18 ± .38	Agree

Note: 1.0-1.74 (Strongly Disagree), 1.75 – 2.49 (Disagree), 2.50 – 3.24 (Agree), 3.25 – 4.0 (Strongly Agree)

Table 2 shows that among respondents in Iligan City trying to quit smoking, the largest group (42.7%, 53 respondents) used e-cigarettes for a median duration of 6–12 months, then 29.8 % (37 respondents) reported using e-cigarettes for less than 6 months before quitting traditional cigarettes altogether. Additionally, approximately 24.2% (30 respondents) reported using e-cigarettes for more than 24 months.

This suggests that e-cigarettes may be helpful in the initial stages of smoking cessation. The prolonged use of e-cigarettes indicates that a quarter of the participants consider these devices as a lasting substitute for traditional cigarettes.

Table 2 Frequency and Percentage Distribution of the Respondents' Duration of E-Cigarette Use

	<i>f (%)</i>	<i>Interpretation</i>
1. Start to Quit Smoking E-Cigarette	37 (29.8%)	Less than 6 months
2. Continuous Use of E-Cigarettes	53 (42.7%)	6 – 12 months
3. Frequency of Usage of E-Cigarettes	30 (24.2%)	More than 24 months

Table 3 shows that 63 (50.8%) were in the action stage, indicating that the respondent had recently taken concrete steps to quit smoking. This finding suggests a strong commitment to smoking cessation in this sample. then 57 (46.0%) of the respondents had already reached the maintenance stage, suggesting that they had successfully quit and endeavored to stay smoke-free.

Table 3 Frequency and Percentage Distribution of the Respondents' Stage of Change

Stages of Change	f (%)
Action	63 (50.8)
Maintenance	57 (46.0)
Total	120

Table 4 shows the results of the Kruskal-Wallis tests revealed no significant difference [$H(2) = 1.04$, and $p = .30$]. This indicates that there was no significant difference between the respondents' perceptions of e-cigarette use and their stage of change in smoking cessation. The respondents generally agreed with e-cigarette use as a tool to quit smoking, regardless of whether they were in the action or maintenance stage. The mean perception score for the action stage was 3.22 (SD = 0.35) with 63 respondents and for the maintenance stage, was 3.13 (SD = 0.41) with 57 respondents. This suggests that the stage of change in smoking cessation did not influence their views on e-cigarette use.

Table 4 Perceptions of E-Cigarette Use as Tool for Smoking Cessation by Stage of Change in Smoking Cessation

<i>Stage of Change</i>	<i>N</i>	<i>Mean ± SD</i>	<i>Interpretation</i>
Action	63	3.22 ± .35	Agree
Maintenance	57	3.13 ± .41	Agree
Total	120		

Note: 1.0-1.74 (Strongly Disagree), 1.75 – 2.49 (Disagree), 2.50 – 3.24 (Agree), 3.25 – 4.0 (Strongly Agree)

Table 5 shows the result of the Chi-square analysis which revealed no significant association between the starting point of an attempt to quit (acting vs. maintaining) and the participant's stage of change in smoking cessation, [$\chi^2(df = 2, n = 120) = 1.38, p = .50$]. For those who started quitting less than six months ago, 21 people are in the action stage, slightly more than the expected 19.4, while 16 people are in the maintenance stage, slightly fewer than the expected 17.6. Among those who started quitting six to twelve months ago, 29 are in the action stage, very close to the expected 27.8, and 24 are in the maintenance stage, close to the expected 25.2. For those who started quitting more than 24 months ago, 13 are in the action stage, fewer than the expected 15.8, and 17 are in the maintenance stage, more than the expected 14.3.

This means that the observed counts closely match the expected counts, suggesting that the time since someone started quitting smoking does not significantly influence whether they are in the action or maintenance stage of smoking cessation. The length of time since quitting began does not appear to significantly affect their progress in quitting smoking.

Table 5 Start of Quitting Smoking vs Stage of Change in Smoking Cessation

		<i>Less than 6 months</i>	<i>6 to 12 months</i>	<i>More than 24 months</i>	<i>Total</i>
Action	Count	21	29	13	63
	Expected Count	19.4	27.8	15.8	63.0
Maintain	Count	16	24	17	57
	Expected Count	17.6	25.2	14.3	57.0
Total	Count	37	53	30	120
	Expected Count	37.0	53.0	30.0	120.0

Table 6 shows the result of the *Chi-square* analysis which revealed no significant association between the continuous use of e-cigarettes and the stage of change in smoking cessation, [χ^2 (df = 2, n = 120) = 3.78, p = .15]. For those using e-cigarettes for less than six months, 21 people are in the action stage, slightly more than the expected 19.4, while 16 people are in the maintenance stage, slightly fewer than the expected 17.6. For people using e-cigarettes for six to twelve months, 29 are in the action stage, very close to the 27.8 we expected. Additionally, 24 people are in the maintenance stage, again very close to the 25.2 we expected. For those using e-cigarettes for more than 24 months, 13 people are trying to quit, fewer than the 15.8 we expected. However, 17 people have already quit smoking and are trying to stay smoke-free, more than the 14.3 we expected.

This means that the length of time someone uses e-cigarettes doesn't make a big difference in whether they are trying to quit smoking or have already quit. The numbers of people in each stage are pretty much what we expected, showing that using e-cigarettes for different amounts of time doesn't significantly change their progress in quitting smoking.

Table 6 Continuous Use of E-Cigarette vs Stage of Change in Smoking Cessation

		<i>Less than 6 months</i>	<i>6 to 12 months</i>	<i>More than 24 months</i>	<i>Total</i>
Action	Count	21	29	13	63
	Expected Count	19.4	27.8	15.8	63.0
Maintain	Count	16	24	17	57
	Expected Count	17.6	25.2	14.3	57.0
Total	Count	37	53	30	120
	Expected Count	37.0	53.0	30.0	120.0

Table 7 shows the result of the *Chi-square* analysis which revealed no significant association between the frequency of e-cigarette use and stage of change, [χ^2 (df = 2, n = 120) = .312, p = .85]. For those who have been using e-cigarettes for less than six months, 41 people are in the action stage, which is very close to the expected 40.4, while 36 people are in the maintenance stage, almost matching the expected 36.6. For those using e-cigarettes for six to twelve months, 13 are in the action stage, slightly fewer than the expected 14.2, and 14 are in the maintenance stage, slightly more than the expected 12.8. For those using e-cigarettes for more than 24 months, 9 are in the action stage, close to the expected 8.4, and 7 are in the maintenance stage, almost matching the expected 7.6.

The observed counts align closely with the expected counts, suggesting that the frequency of e-cigarette use does not significantly influence whether users are in the action or maintenance stage of smoking cessation. The frequency of e-cigarette use appears to have little impact on their progress in quitting smoking.

Table 7 Frequency of E-cigarette Use vs Stage of Change in Smoking Cessation

		<i>Less than 6 months</i>	<i>6 to 12 months</i>	<i>More than 24 months</i>	<i>Total</i>
Action	Count	41	13	9	63
	Expected Count	40.4	14.2	8.4	63.0
Maintain	Count	36	14	7	57
	Expected Count	36.6	12.8	7.6	57.0
Total	Count	77	27	16	120
	Expected Count	77.0	27.0	16.0	120.0

IV. DISCUSSION

Our study on e-cigarette use in Iligan City uncovered several noteworthy findings. Most respondents favored e-cigarettes as a method for quitting traditional smoking, with an average rating of 3.45 out of 4. This suggests that e-cigarette users believe these devices can help them stop smoking traditional cigarettes.

The duration of e-cigarette use revealed different patterns. Over six to twelve months, 42.7% of participants used e-cigarettes to quit traditional smoking. This indicates that e-cigarettes can aid smoking cessation, with nearly 30% of participants quitting within six months. However, 24.2% have been using e-cigarettes for over twenty-four months,

suggesting they might serve as a long-term substitute for some users.

Almost half of the participants (46%) had reached the maintenance stage, successfully avoiding traditional smoking, while 50.8% were in the action stage, actively taking steps to quit. Despite these trends, our analysis showed no significant relationship between respondents' perceptions of e-cigarettes, their duration of use, and their stage in the quitting process. This complexity suggests that personal experiences with e-cigarettes vary widely.

Our findings align with existing literature. A systematic review and meta-analysis by Grabovac et al. (2020) indicated that nicotine e-cigarettes might be more effective for smoking cessation compared to placebo e-

cigarettes or nicotine replacement therapy. This supports our respondents' generally positive views on e-cigarettes as a cessation tool. However, the variation in perceptions suggests diverse user experiences.

Half of our respondents were in the action stage, echoing findings from Chun et al. (2022), which showed increased quit attempts among cigarette-only users. Additionally, 46.0% were in the maintenance stage, highlighting a strong commitment to sustaining cessation.

Our research aligns with Yoon et al. (2022), indicating no significant association between e-cigarette perceptions and stages of change. Positive views on e-cigarettes were consistent across different stages, with mean scores of 3.22 for the action stage and 3.13 for the maintenance stage.

Similarly, our findings on the lack of association between quitting smoking and stages of change align with Ahmad and Singh (2021). Different processes influence various stages, suggesting that starting to quit smoking is independent of the stage of change.

Continuous e-cigarette use also showed no significant correlation with cessation progress, supporting Wang et al. (2021). Most respondents (42.7%) used e-cigarettes for 6-12 months, the highest percentage among duration categories.

Finally, our research concurs with Zhang et al. (2024), finding no significant link between e-cigarette use frequency and cessation stages. This reinforces that frequency does not directly influence cessation progress.

These insights reveal that while e-cigarette users in Iligan City view them positively as a cessation tool, personal experiences and usage patterns vary. This suggests that other factors not considered in our research might influence the quitting journey.

Our study emphasizes the need for coordinated efforts to address prolonged e-cigarette use. Schools, companies, public health authorities, policymakers, and the government, including the Department of Education (DepEd), should collaborate. Educational programs should discourage e-cigarette use and promote a smoke-free environment. Companies must practice responsible marketing and provide accurate information. Public health campaigns should focus on the long-term risks of e-cigarettes, and policymakers must regulate youth-targeted marketing. Comprehensive policies and cessation strategies should be developed in collaboration with educational institutions and healthcare providers. DepEd should integrate e-cigarette education into the curriculum, shaping students' perceptions and fostering a nicotine-free lifestyle.

Our study has limitations, relying on self-reported data, which might be influenced by respondents' honesty and accuracy. The sample size of 120, while substantial, may not represent all e-cigarette users in Iligan City, and convenience sampling could introduce selection bias.

Future research should use larger, more diverse samples and random sampling methods to reduce bias and improve generalizability. Multiple data collection methods, such as interviews or observations, can validate self-reported data. E-cigarette users need access to credible information on their benefits and risks for cessation, and healthcare professionals should stay informed to provide evidence-based guidance and personalized support.

In conclusion, our study highlights that while e-cigarettes are generally viewed positively for smoking cessation in Iligan City, their effectiveness and usage patterns vary. Most users believe in their potential to help quit smoking, but personal factors significantly influence the quitting journey. These findings underscore the need for personalized smoking cessation approaches, considering the diverse experiences and motivations of e-cigarette users.

➤ *Attribution of Personal Funds*

The research reported in this paper was conducted using personal funds.

➤ *Conflict of Interest*

The authors have no conflicts of interest related to this research.

➤ *Data Availability Statement*

The data that support the findings of this study are available from the corresponding author upon reasonable request. Due to the sensitive nature of the data collected, including personal information about participants, the data are not publicly available. However, requests for access to the data will be considered by the corresponding author.

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