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# Assessing the Effectiveness of an Educational Flipchart on Smoking among Cigarette Smokers in Sitio Magnolia, Quezon City - An Interventional Study

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## ABSTRACT

Based on the World Health Organization report in 2021, there were 991 million tobacco smokers in 2020 globally making cigarette smoking a persistent health challenge worldwide. In the Philippines, only limited efforts are conducted to educate cigarette smokers regarding its detrimental effects. The research aimed to assess the effectiveness of a flipchart intervention on cigarette smokers by measuring the change in perceived knowledge and perceived desire through pre-test and post-test questionnaires. The study employed an interventional pre-test-post-test research design. Simple random sampling technique was used and the target sample size was calculated using OpenEpi Version 3 resulting in 98 participants. The study was conducted last March 2024 in Sitio Magnolia and 88 participants were able to receive the intervention. Majority of the participants were male (51.14%), between 18-35 years old (47.73%), able to finish high school level (64.77%), and had a monthly income of Php 1,001-10,000 (39.77%). The majority had been smoking for 1-5 years (47.73%), were light smokers (97.73%), and their reason for smoking was due to stress (39.62%). Overall, there was a decrease in the perceived desire mean scores (Pre-test Scores: 2.62 (Q1) and 3.14 (Q2) and Post-test Scores: 2.14 (Q1) and 2.38 (Q2)) indicating a decrease in the respondents' crave to smoke. In terms of perceived knowledge, the overall average for pre-test and post-test were 74.20% and 78.07%, respectively. Perceived desire and perceived knowledge pre-test and post-test results revealed significant differences (p-values: 0.003, <.001, <.001) using the Wilcoxon Signed Rank Test which emphasized the effectiveness of the intervention. Participants expressed positive satisfaction with the interventional having mean scores of 4.61 and above. Researchers recommend a longitudinal study for both desire and knowledge and an increase in the sample population for better generalizability.

**Key words:** Perceived desire, perceived knowledge, flipchart educational material, intervention

Cigarette smoking is known to be highly addictive due to its nicotine content which causes the release of dopamine in the brain resulting in a short-term sensation of relaxation, pleasure, and mood elevation.<sup>1</sup> As a consequence, cigarette smokers crave more thus increasing cigarette intake which in the long term makes them more susceptible to many health conditions, particularly lung cancer, chronic

respiratory conditions, heart diseases namely stroke and blood circulation problems, diabetes, and others.<sup>2</sup> As a result, the tobacco epidemic is one of the biggest public health threats in the world killing over 8 million people a year.<sup>3</sup> Even though tobacco usage decreased from 29.7% in 2009 and 23.8% in 2015 to 19.5% in 2021, this statistics underscores that nearly one in five Filipino adults still engages in tobacco consumption.<sup>4</sup>

There are only a few laws and anti-smoking educational campaigns in the Philippines that have been implemented despite the increase in cigarette users and cigarette smoking being declared as one of the biggest public health threats. An example is the

“Sin Tax Reform Law” or the Republic Act 10351 wherein a price increase of 4% every year for a pack of cigarettes was implemented in 2018 to control the demands that greatly affect the public’s health.<sup>5</sup> The aforementioned law showed a significant decrease of about 28.7% in 2009 to 22.7% in 2015 in cigarette smoking among Filipino adults. In addition to this, another law was implemented, the Republic Act 10643 commonly known as the “Graphics Health Warnings Law” wherein all packs of cigarettes were required to have pictorial health warnings and should be replaced every 24 months. This law was proven ineffective in preventing and discouraging Filipinos from engaging in cigarette smoking.<sup>6</sup> Students from Northern Iloilo conducted a study similar to the “Graphics Health Warning Law” by assessing the impact of anti-smoking campaigns such as symposiums, posters, lectures, and video clips to Junior High School students. Results showed increased weariness and concern with the health repercussions associated with smoking, more notably the fear of cancer.<sup>7</sup>

Given the limited studies on educational material specifically for cigarette smoking, this study aimed to bridge this gap through the assessment of the effectiveness of the flipchart educational material designed by the student pharmacists through comparing the changes in the perceived knowledge and perceived desire utilizing pre-test and post-test questionnaires. Furthermore, the satisfaction of the participants related to the intervention and material was also evaluated.

## **MATERIALS AND METHODS**

### **Study Design**

The researchers utilized an Interventional Research Design, specifically, pre-test and post-test design to assess the effectiveness of the flipchart material related to smoking by describing the changes in perceived knowledge and perceived desire before and after the educational intervention is presented.

### **Population and Sampling Technique**

The population of the study consisted of cigarette smokers from Sitio Magnolia of Barangay West Fairview Quezon City. The participants were 18-60 years old and smoked at least 1 stick daily; were able to read and understand either English or Filipino; and who were willing to participate in the program.

Those who used vape or e-cigarettes; who were under cessation therapy; and who were not able to finish the intervention and the presentation of the flipchart were excluded from the study.

The sample size was calculated using Open Source Epidemiologic Statistics for Public Health Version 3, with a population size (N) of 131, a hypothesized frequency (p) of 50%, and a confidence interval of 95%. Hence, 98 participants were asked to participate in the study.

Simple Random Sampling was utilized to recruit all participants necessary for the study.

### **Research Instrumentation and Validation**

The study utilized a flipchart educational material, pre-test and post-test questionnaires, and a satisfaction survey related to the intervention that was adapted from the Smoking Behavior Research Questionnaire and Youth Tobacco Survey (YTS) 2011. The researchers modified the questionnaire to suit the objectives of the study which measured the perceived knowledge and perceived desire of the respondents related to cigarette smoking.

The flipchart material consisted of the following topics: (i) Karanasan sa paninigarilyo (Experiences in smoking); (ii) Pagharap sa triggers (Encountering triggers); (iii) Mga epekto sa kalusugan ng paninigarilyo (Health repercussions of smoking); (iv) Mga benepisyo sa kalusugan ng pagbawas ng paninigarilyo (Health benefits of reduced smoking); (v) Mga gastos sa paninigarilyo (Expenditure on cigarettes); and (vi) Wastong pamamahala (Proper management and control). The flipchart material underwent face validation by two physicians, two registered pharmacists, two registered nurses, one Filipino teacher, and two smokers. The overall score of the validation was 0.90 which was above the 0.78 cut-off score for at least 9 experts (Lynn, 1986) based on the Scale-level Content Validity Index based on the Average Method (S-CVI/Ave) signifying that the tool was ready for use.

The pre and post-test questionnaires consisted of 19 questions: (i) demographic profile (7 items); (ii) desire to smoke (2 items) which was measured through a Likert scale; (iii) knowledge of smoking (10 items) which was measured through true or false questions. A separate satisfaction survey was also given which was likewise measured through a Likert scale (5 items). The following questionnaires were also validated by the same professionals using S-CVI/

Ave which obtained a score of 0.90. This signified that the questionnaires passed the CVI cut-off score of at least 0.78 for 9 experts.<sup>8</sup>

Additionally, pilot testing was conducted on 30 participants prior to the intervention. A Cronbach alpha score of 0.726 was obtained indicating an acceptable result for the questionnaires' internal reliability and consistency.

## **Data Collection**

Data collection was conducted last March 2024. The process was divided into three major parts: 1) Pre-Implementation; 2) Actual-Implementation; and 3) Post-Implementation.

### *1) Pre-Implementation Procedures*

First was the educational intervention tool improvement and validation, including the pre-test and post-test (Appendix F) that has undergone face validation by a panel of experts. All comments and suggestions, such as including information on the effects of smoking to their loved ones, simplifying the Filipino terms, and adding "others" as one of the choices in reasons behind smoking were taken into consideration and were included in the finalization of the research tool.

Upon the completion of the revisions, the researchers compiled and completed all the requirements of the different community engagement personnel of the university and target community. A focus group discussion was conducted to present the objectives of the study and finalize all the necessary information related to its execution, such as the date, time, and venue. Additionally, posters were disseminated in the community with the help of the community leaders to inform the residents about the intervention.

### *2) Actual-Implementation Procedures*

The participants were gathered in the Multipurpose Center of Sitio Magnolia with the help of the community leaders. Upon their arrival, the participants were decked to the available researcher for them to receive the educational intervention. The researchers followed a script in facilitating the discussion and consent forms

were distributed and explained to the respondents. After signing, the pre-test questionnaires were distributed and answered by the participants. The researchers presented the educational intervention that lasted for about thirty (30) to forty-five (45) minutes depending on the participants' and researcher's interactions. After the intervention, the researchers provided a post-test questionnaire.

### *3) Post-Implementation Procedures*

The participants answered a satisfaction survey and were given a token of appreciation worth Php 102.00 which included biscuits, coffee, and powdered milk contained in an eco bag, and a snack with a drink worth Php 60.00 for their participation.

## **Data Processing and Analysis**

Data collected were encoded in Microsoft Excel 2023 and imported to Jamovi version 2.3 where all statistical tests were performed. Descriptive statistical analysis (percentage and mean) was utilized to assess the participant's demographics which are age (years), sex, educational attainment, monthly income (Philippine peso), length of smoking (years), number of sticks smoked per day (computed to pack-years), and reasons for smoking. For the assessment of the effectiveness of the smoking flipchart, mean scores, and percentages were computed for the pre-test and post-test results of cigarette smokers' perceived knowledge, perceived desire, and satisfaction. Wilcoxon Signed Rank Test was used to assess the significant differences in the mean scores of the pre-test and post-test scores regarding participants' perceived knowledge and perceived desire to smoke. A p-value < 0.05 was considered statistically significant for both tests.

## **Ethical Considerations**

The research received approval and clearance from Far Eastern University - Dr. Nicanor Reyes Medical Foundation Institutional Ethics Review Committee (FEU-NRMF IERC) on the 29th day of February 2024 before its commencement, under the FEU-NRMF IERC Code 2023-0126 and by the Data Privacy Office (DPO).

# RESULTS

## Demographics

In total, 88 out of 98 participants (89.80%) were included in the data analysis, and 10 individuals (10.20%) were excluded for being either under 18 or over 60 years old, undergoing cessation therapy, or exposed to second-hand smoke.

The demographic profile of the respondents is summarized in Table 1. The majority of the respondents were male (51.14%), young people (47.73%), completed high school level (64.77%) whose monthly income ranged from Php 1,001-10,000 (39.77%). Furthermore, the majority of the participants have smoked for about 1-5 years (47.73%), light smokers (97.73%), and smoked due to stress (39.62%).

## Effectiveness of Smoking Flipchart Material

### 1) Pre-Test and Post-Test Perceived Desire

In the pre-test portion of the perceived desire, the majority of the respondents answered Neutral for both questions. After the intervention was conducted, most of the respondents answered Strongly Disagree in the post-test as presented in Table 2. These indicated that after the intervention was conducted, most of the participants' desire to smoke decreased.

### 2) Pre-Test And Post-Test Knowledge

The average scores of the pre-test and post-test of perceived knowledge were 74.20% and 78.09%, respectively (Table 3). This indicated that there was

**Table 1.** Demographic profile of the participants

| Characteristic            | n  | Responses (%) |
|---------------------------|----|---------------|
| Age                       |    |               |
| 18-35 (Young)             | 42 | 47.73%        |
| 36-55 (Middle-aged)       | 38 | 43.18%        |
| 56-60 (Old aged)          | 8  | 9.09%         |
| Sex                       |    |               |
| Male                      | 45 | 51.14%        |
| Female                    | 43 | 48.86%        |
| Educational Attainment    |    |               |
| Elementary                | 17 | 19.32%        |
| Highschool                | 57 | 64.77%        |
| College                   | 14 | 15.91%        |
| Monthly Income (Php)      |    |               |
| 0 - 100                   | 25 | 28.41%        |
| 101 - 1,000               | 1  | 1.14%         |
| 1,001 - 10,000            | 35 | 39.77%        |
| 10,001 - 20,000           | 22 | 25%           |
| 20,001 - 30,000           | 4  | 4.55%         |
| 40,001-50,000             | 0  | 0%            |
| 50,001-60,000             | 0  | 0%            |
| 60,001 -70,000            | 1  | 1.14%         |
| Length of Smoking (Years) |    |               |
| 1 - 5                     | 42 | 47.73%        |
| 6 - 10                    | 13 | 14.77%        |
| 11 - 15                   | 6  | 6.82%         |
| 16 - 20                   | 17 | 19.32%        |
| 21 - 25                   | 4  | 4.55%         |
| 26 - 30                   | 2  | 2.27%         |
| 31 - 35                   | 2  | 2.27%         |
| 36 - 40                   | 0  | 0%            |
| 41 - 45                   | 1  | 1.14%         |
| 46 - 50                   | 1  | 1.14%         |
| Pack Years                |    |               |
| Light smoker              | 86 | 97.73%        |
| Moderate smoker           | 2  | 2.27%         |
| Reason for Smoking        |    |               |
| Stress                    | 42 | 39.62%        |
| Influence from Others     | 29 | 27.36%        |
| Curiosity                 | 7  | 6.60%         |
| Habit                     | 25 | 23.58%        |
| Pregnancy                 | 3  | 2.83%         |

**Table 2.** Pre-test & post-test survey of the respondents regarding their perceived desire to smoke.

| Perceived Desire<br>(Pre-Test and Post-Test)           |                  | 1- Strongly Disagree | 2- Disagree | 3 - Neutral | 4 - Agree   | 5 - Strongly Agree |
|--------------------------------------------------------|------------------|----------------------|-------------|-------------|-------------|--------------------|
| Q1: At this time, I have the urge to smoke a cigarette | Pre-Test Desire  | 26 (29.55%)          | 8 (9.09%)   | 38 (43.18%) | 5 (5.68%)   | 8 (9.09%)          |
|                                                        | Post-Test Desire | 41 (46.59%)          | 11 (12.50%) | 20 (22.73%) | 7 (7.95%)   | 5 (5.68%)          |
| Q2: I often smoke cigarettes                           | Pre-Test Desire  | 8 (9.08%)            | 11 (12.50%) | 44 (50%)    | 11 (12.50%) | 11 (12.50%)        |
|                                                        | Post-Test Desire | 30 (34.09%)          | 14 (15.91%) | 28 (31.82%) | 8 (9.09%)   | 5 (5.68%)          |

an increase in participants' perceived knowledge after the intervention.

### 3) *Significant Difference between the Pre-Test and Post-Test Scores of Perceived Desire*

The Wilcoxon Signed Rank Test was conducted for both questions to determine the significant difference in the participants' perceived desire to smoke. For Q1, it resulted in a p-value of 0.003, and for Q2, it had a p-value of <.001. Both results indicated a statistically significant difference in perceived desire scores before and after the intervention as seen in Table 4.

Furthermore, the Wilcoxon Signed Rank Test was also conducted in determining the significant difference in participants' perceived knowledge on the effects and consequences of smoking, resulting in a p-value of <.001 as seen in Table 4. This indicated a statistically significant increase in perceived knowledge scores after the intervention.

### 4) *Satisfaction Results of the Cigarette Smokers to the Flipchart Intervention*

Table 5 presents the satisfaction of the respondents with the educational material the researchers provided.

For Q1, most of the respondents answered Strongly Agree (69.32%) with a mean score of 4.61. For Q2, most respondents answered Strongly Agree (76.14%) with a mean score of 4.73. For Q3, most respondents answered Strongly Agree (76.14%) with a mean score of 4.66. For Q4, most respondents answered Strongly Agree (75%) with a mean score of 4.67. Lastly, for Q5, most respondents answered Strongly Agree (73.86%) with a mean score of 4.69.

## DISCUSSION

The study revealed that the majority of the cigarette smokers in the locale were mostly male, young, and had smoked for 1 to 5 years. Young adults who are occasional smokers have a high risk of being an established smoker.<sup>9</sup>

Most of the respondents were high school graduates with a monthly income of Php 1,001 - 10,000, which is considered poor.<sup>10</sup> These results coincide with a study conducted in South Korea where it was found that the increasing prevalence of cigarette smoking has a relationship with those who are of low socioeconomic status and those who have low educational attainment.<sup>9</sup>

**Table 3.** Pre-test and post-test survey of the respondents regarding their perceived knowledge about smoking.

| Perceived Knowledge (Pre-test and post-test) | Mean (Expressed as percentage) |
|----------------------------------------------|--------------------------------|
| Pre-Test Knowledge                           | 74.20%                         |
| Post-Test Knowledge                          | 78.07%                         |

**Table 4.** Results of Wilcoxon Signed Rank Test on perceived desire and perceived knowledge pre-test and post-test.

| Wilcoxon Signed Rank Test |                     |            |           |       |
|---------------------------|---------------------|------------|-----------|-------|
| Perceived Desire          |                     |            |           |       |
|                           |                     |            | Statistic | p     |
| Pre-Test Desire Q1        | Post-Test Desire Q1 | Wilcoxon W | 1082      | 0.003 |
| Pre-Test Desire Q2        | Post-Test Desire Q2 | Wilcoxon W | 1170      | <.001 |
| Perceived Knowledge       |                     |            |           |       |
| Pre-Test Knowledge        | Post-Test Knowledge | Wilcoxon W | 729       | <.001 |

**Table 5.** Satisfaction results of the respondents on the educational material that is presented.

| Satisfaction with the interventional material presented                               |                      |             |             |             |                    |
|---------------------------------------------------------------------------------------|----------------------|-------------|-------------|-------------|--------------------|
|                                                                                       | 1- Strongly Disagree | 2- Disagree | 3 - Neutral | 4 - Agree   | 5 - Strongly Agree |
| Q1: The intervention has helped my awareness of the health risks of cigarette smoking | 0 (0%)               | 2 (2.27%)   | 3 (2.41%)   | 22 (25%)    | 61 (69.32%)        |
| Q2: I understood the contents of the interventional material                          | 0 (0%)               | 0 (0%)      | 3 (2.27%)   | 18 (20.45%) | 67 (76.14%)        |
| Q3: The content of the presentation was clear and well organized                      | 2 (2.27%)            | 1 (1.14%)   | 1 (1.14%)   | 17 (19.32%) | 67 (76.14%)        |
| Q4: The intervention was effective in curbing my desire to smoke cigarettes           | 0 (0%)               | 2 (2.27%)   | 3 (2.27%)   | 17 (19.32%) | 66 (75%)           |
| Q5: All necessary information are included in the presentation                        | 0 (0%)               | 1 (1.14%)   | 3 (2.27%)   | 18 (20.45%) | 65 (73.86%)        |

Additionally, stress is a prevalent reason for smoking among the respondents which was also evident in China followed by curiosity, peer influence, and habit.<sup>11</sup> Pregnancy may also contribute to smoking, while it serves as a contributor to smoking cessation, the risk of relapse is higher. In the year 2006 to 2015, the smoking rate of pregnant women in Japan was 2.5% to 7.9%.<sup>12</sup>

After the flipchart was presented, it was evident that the perceived desire of the smokers significantly decreased. Through the utilization of anti-smoking campaigns, participants expressed a desire to quit smoking but also expressed increased weariness and concern about the consequences of consuming cigarettes.<sup>7</sup> In addition, the perceived effectiveness of an anti-smoking campaign called “Tips from former smokers” showed an increase in the history of quit attempts in smoking.<sup>13</sup>

The researchers also discovered that most participants had a fair level of perceived knowledge about smoking with an average score of 74.20%. Participants correctly identified smoking’s link to lung health deterioration<sup>14</sup> and its influence from friends and family<sup>15,16</sup> as well as the presence of addictive chemicals in cigarettes. Looking at the perceived knowledge of participants before and after the intervention, results showed that there is a statistically significant difference ( $p < 0.001$ ). “Innovative and attractive experiential learning prevention program”

can produce a significant, immediate, and observable enhancement of knowledge about smoking and its consequences.<sup>17</sup> Although it was carried out among adolescents, it cannot be underestimated that such interventions have a positive impact on a smoker’s perceived knowledge.

The impact of the flipchart educational material was found effective as differences were found in the respondents’ perceived desire and perceived knowledge of cigarette smoking before and after being presented with the flipchart. In addition, scores obtained from the pre-test and post-test survey were not presented to the participants thus, it is ensured that the increase in knowledge was not due to the ‘testing effect’ but due to the gained knowledge from the educational flipchart. The satisfaction survey was solely conducted to determine if the participants were satisfied with the intervention. Post-test results of the patients’ knowledge of tuberculosis improved by 17% following the utilization of a flipchart presentation.<sup>18</sup> Furthermore, the utilization of visual aids as educational intervention leads to considerable gains in health literacy levels.<sup>19</sup>

## CONCLUSION

Out of 98 respondents, only 88 respondents (89.80%) were able to comply with the inclusion criteria of the study which were dominated by male

participants. The majority of the residents that underwent the intervention were young adults, ranging from 18-35 years old, with an income bracket of Php 1,001-10,000. Most of the participants had smoked for 1-5 years and were light smokers. Stress was cited as a frequent reason for cigarette consumption. The flipchart material showed an effect by decreasing the perceived desire to smoke and increasing the perceived knowledge of the respondents regarding the effects and consequences of smoking. Moreover, the participants expressed satisfaction with the interventional material.

The study further revealed that the intervention proved a statistical difference between the perceived desire and perceived knowledge of the respondents on smoking cigarettes, albeit with varying degrees. The researchers recommend 1) Prolonging the duration of the intervention's implementation; 2) Improving the research instrumentation by adding several items related to cigarette smoking, specifically for the perceived desire; 3) Increasing the sample size to make the result more generalizable; and 4) Making the interventional material animated for a more entertaining presentation.

## Limitations

Despite the flipchart material showing a significant difference in the perceived desire and perceived knowledge and can be said to be effective to cigarette smokers, several limitations should be acknowledged.

The study solely focused on the assessment of the effectiveness of the flipchart by measuring only the perceived desire and perceived knowledge of the participants based on the material which limits the topics being tackled by the researchers. This study only focused on Sitio Magnolia of Barangay West Fairview, Quezon City hence, having a relatively small sample size affecting the generalizability of the results.

Furthermore, the researchers believe that a one-day implementation may not result in a prolonged impact on the participants' perceived desire to smoke and perceived knowledge. Lastly, the researchers would like to emphasize that this study does not establish any correlation nor causation between the interventional material and the results of the study lacks a control group to base on and has not conducted any statistical analyses to conclude such a relationship exists.

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