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Graduate Studies

PERCEPTION OF HARM IN UWL INTERNATIONAL UNDERGRADUATES ON  
SMOKING TOBACCO

A Manuscript Style Thesis Submitted in Partial Fulfillment of the Requirements for the  
Degree of Master of Public Health

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PERCEPTION OF HARM IN UWL INTERNATIONAL UNDERGRADUATES ON  
SMOKING TOBACCO

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We recommend acceptance of this thesis in partial fulfillment of the candidate's requirements for the degree of Master of Public Health in Community Health Education.

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## ABSTRACT

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*Abstract.* Cigarette smoking among college students continues to be a major health concern in the United States. Studies showed that peer influences, weight control behavior, depression, anxiety, and stress are significant predictors of cigarette smoking among college students. With increases in use, there is concern among public health officials as to whether e-cigs represent a “gateway” to future tobacco cigarette smoking and whether e-cigs will lead to nicotine addiction among youth. The other side of this argument supports the concept of e-cigs as a harm reduction product to reduce cigarette smoking, resulting in e-cigs being marketed as “safer” alternatives to cigarette smoking. College students are included in the age group 18-24 shown to be at increased risk for using nontraditional tobacco products, including e-cigs. College students are often drawn to novel products and are generally more accepting of e-cig use in public compared with cigarette smoking. *Objective.* The purpose of this cross-sectional descriptive study is to better understand the perception of international undergraduate students at UW-La Crosse regarding the harm associated with smoking tobacco. *Participants.* A total of 22 International Undergraduate students from the University of Wisconsin-La Crosse participated in the study in March of 2017. Participants completed a web-based questionnaire consisting of demographic items as well as items related to perception of harm by smoking tobacco. *Methods.* Descriptive statistics were used to determine the frequency and percentage. *Results.* According to the survey e-cigarettes were perceived as having the least amount of risk, followed by hookah and cigars, cigarillos, and then cigarettes. Students who perceived a continuum of cigarette-related harm were consistently more likely to perceive e-cigarettes as less harmful than conventional cigarettes compared to those with a consistently high perception of cigarette harm. Such findings suggest that many students may be susceptible to e-cigarette use. Hookah and electronic cigarettes were the most favorably perceived products, which may reflect the effective efforts to market these products as safe and socially acceptable. E-Cigarettes and Hookah seem to have particularly high appeal among this population, with very high positive perceptions in terms of low perceived harm to health as well as high social acceptability. Furthermore, e-cigarettes and hookah were the most commonly used tobacco products daily and less than monthly. *Conclusions.* The present study provides information regarding perceptions of harm to health by smoking various tobacco products. E-cigarette was generally perceived to be the least harmful, with cigar’s and hookah closely following. Cigarettes and cigarillos were perceived as the most negatively and more harmful to health. Future research is needed to document reasons for these perceptions as well as to document the true nature of the health risks. Doing so will inform the development of public health campaigns and interventions to alter these perceptions related to the use of these tobacco products.

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## **INTRODUCTION**

Tobacco use continues to be the leading cause of death in the United States as the mortality among both male and female smokers is three times higher than that of those individuals who have never smoked (Centers for Disease Control and Prevention [CDC], 2014). The Centers for Disease Control and Prevention (2014) has noted that tobacco use leads to more than 480,000 deaths annually with cigarette use in particular causing one in every five deaths. Cigarettes continue to be the main source of tobacco use in the United States among young adults (Rigotti, Lee, & Wechsler, 2000; Smith-Simone, Maziak, Ward, & Eissenberg, 2008).

In recent years, to add to the nation's issues with tobacco, a host of alternative products, including small cigars (i.e., little cigars, cigarillos), smokeless tobacco products (i.e., chew, snus, dissolvable tobacco products), and electronic cigarettes, have been introduced to the US market, while water pipes or hookah also have increased in popularity (Etter, 2010; Knishkowsky & Amitai, 2005; Berg, C. et al 2015, Nilsson M, 2010).

### **Statement of the Problem**

Despite declines in cigarette smoking prevalence in the U.S., adolescents and college students remain highly susceptible to initiating tobacco use. The increasing diversity of tobacco products on the market, including electronic cigarettes (e-cigarettes), presents new opportunities for youth experimentation and initiation. Between 2011 and 2012, ever use of e-cigarettes among college students doubled from 3.3% to 6.8% and currently using doubled from 1.1% to 2.1%. Previous research has shown that low harm perceptions of cigarettes

predicted experimentation by college students. Despite the lack of evidence from adequately designed studies, considerable media attention has been given to the e-cigarette's potential as a smoking-cessation aid and less harmful alternative to conventional cigarettes (Ambrose, 2014).

The United States hosts the largest number of foreign students in the world. The number of international students enrolled in 2-year and 4-year colleges increased 28-fold between the 1948–1949 academic year and the 2010–2011 academic year, from 25,464 students to 723,277 students. The health behaviors of college students are important because behaviors established in the transition between adolescence and early adulthood can be consolidated into lifetime patterns and potentially affect long-term health. Smoking is a behavior that has serious short and long-term health consequences (Seo, 2013).

With increases in use, there is concern among public health officials as to whether e-cigs represent a “gateway” to future tobacco cigarette smoking and whether e-cigs will lead to nicotine addiction among youth (Arrazola, Singh, Corey, et al., 2015; Dutra & Glantz, 2014; Riker, Lee, Darville, & Hahn, 2012). The other side of this argument supports the concept of e-cigs as a harm reduction product to reduce cigarette smoking; (Cahn & Siegel, 2010) e-cigs are often marketed as “safer” alternatives to cigarette smoking. Surveys of U.S. adults indicate that the highest prevalence of e-cig use is among 18–24-year-old (Adkison, O'Connor, Bansal-Travers, et al., 2013; Agaku et al., 2014; King, Alam, Promoff, Arrazola, & Dube, 2013; Regan, Promoff, Dube, & Arrazola, 2013). College students are included in the age group shown to be at increased risk for using nontraditional tobacco products, including e-cigs (Cobb & Abrams, 2011; Pearson, Richardson, Niaura, Vallone, & Abrams, 2012; Regan et al., 2013). College students are often drawn to novel products (Choi, Fabian,

Mottey, Corbett, & Forster, 2012) and are generally more accepting of e-cig use in public compared with cigarette smoking in public (Trumbo & Harper, 2013).

Additionally, we know that there are over 1,043,839 students attending schools here in United States from all over the world (IEE 2016). Currently, there is little research regarding these individuals smoking habits on US college campuses. Given the health effects of smoking tobacco it is important to understand International Students perspectives on using these products to better address changing their habits.

### **Need for the Study**

The health behaviors of International college students are important because behaviors established in the transition between adolescence and early adulthood can be consolidated into lifetime patterns and potentially affect long-term health. Despite widespread health warnings about the risks associated with cigarette use and the decrease in the social acceptability of smoking over the past decades, in the U.S and abroad, college years seem to be a time when many students initiate or continue to smoke cigarettes. Cigarette smoking among college students continues to be a major health concern in the United States. Studies showed that peer influences, weight control behavior, depression, anxiety, and stress are significant predictors of cigarette smoking among college students. With regard to international student's, research has shown in the United States length of stay was negatively correlated with cigarette smoking. International students living off campus were more likely than those living on campus to have an increase in smoking cigarettes. International students living alone and those living with at least one person who drinks alcohol as well as smokes cigarettes were more likely to experience an increase in smoking

than those living with at least one person who neither drinks alcohol nor smokes cigarettes (Seo, 2013).

The increasing diversity of tobacco products on the market, including e-cigarettes, presents new opportunities for youth experimentation and initiation (Ambrose, 2014). This starts when an international student arrives in U.S. There are very few studies that have investigated this population in colleges/universities. Specifically, with this investigation, I will look at the perceptions of international undergraduate students at UW-L regarding harmful effects due to smoking tobacco.

### **Purpose of the study**

The purpose of this study is to better describe the perception of international undergraduate students at UW-La Crosse regarding the harm associated with smoking tobacco.

### **Research Question**

What are the perceptions of International Undergraduate Students at UWL regarding harmful effects of smoking tobacco?

### **Type of Epidemiological Study**

This investigation is a cross-sectional descriptive study, utilizing a web-based questionnaire. I will be conducting this study to better describe the perceptions of international undergraduate students at UW-La Crosse regarding the harm associated with smoking tobacco. My questions to students regarding smoking tobacco focusing on harm perceptions. The four-level response scale for each question was no harm, little harm, some harm, and a lot of harm this scale was based upon a study conducted by Ambrose, 2014. These questions along with selected demographics were obtained to the research question. I, as the investigator, collected the descriptive data on this issue, which can be used to guide

future studies. My population will be International Undergraduate students enrolled at the University of Wisconsin, La Crosse during spring semester 2017.

### **Data Collection**

I, as the investigator, used a survey method for collecting data. The software for questionnaire design and dissemination was Qualtrics. The data collection tool was a Questionnaire, and disseminated to my population via email and each respondent remain anonymous. There are 140 International Undergraduates at UWL (2-Australia, 1- Bangladesh, 1-Brazil, 1-Canada, 60-China, 5-Denmark, 1-Egypt, 2-Finland, 1-France, 10-Germany, 1-India, 1-Italy, 11-Japan, 6-Korea, 2-Mexico, 2-Nigeria, 1-Norway, 1-Pakistan, 14-Saudi Arabia, 1-Senegal, 1-South Africa, 1-Taiwan, 3-United Kingdom, 10-Vietnam, 1-Zimbabwe) (personal communication with Miranda Panzer, International Student Advisor, International Education & Engagement (IEE), UW-L) on 8<sup>th</sup> December. A sample survey of the appropriate questions that was asked can be found in the appendices.

### **Data Analysis**

Frequencies and percentages were used to describe the responses and answer the research question.

## **MATERIALS AND METHODS**

### **Participants**

The sample for this cross-sectional descriptive study consisted of 22 International undergraduate students from the University of Wisconsin La-Crosse (UW-L). A variety of countries students participated in the study including (Bangladesh (n=1), China (n=10), France (n=1), Germany (n=1), India (n=1), Italy (n=1), Korea (n=1), , Saudi Arabia (n=3), South Africa (n=1), Vietnam (n=1), Zimbabwe (n=1) overall (n=22).

### **Instrument**

The instrument used in this study was a 17-item questionnaire (See Appendix B) modified from Ambrose, 2014. Minor modifications were made to questions to reflect the perceptions. Additional demographic questions were also added. The questionnaire consisted of 6 Likert-type questions. The 4 levels of harm were defined as no harm, little harm (Cough, Mouth sores), some harm (Breathing problems, Asthma), and a lot of harm (Cancer, Heart attack, Lung cancer, Death). The questionnaire included items to better understand the perception of international undergraduate students at UW-La Crosse regarding the harm associated with smoking tobacco.

### **Procedures**

Approval for this study was obtained from the UW-L Institutional Review Board (IRB). Following IRB approval, students were asked to complete a web-based survey. Prior to completing the questionnaire, participants were given an informed consent by email

before they take the survey and were informed again at the end of the survey that their participation was voluntary and anonymous (See Appendix C). Data were collected through Qualtrics from March 07, 2017 to March 25, 2017. Descriptive statistics were used to determine the frequency and percentage associated with the survey questions.

*Perceptions of overall harm.* International Undergraduate students were asked to rate their perception of overall harm to their health if they used e-cigarettes, cigarettes, cigars, cigarillos and hookah two to three times a day or every day. Responses were made on a four-point scale (1 being no harm and 5 being a lot of harm).

## **RESULTS**

### **Demographics**

Participants provided demographic data including sex, nationality and race/ethnicity. A total of 22 participated in this study out of 140. Of the 22 participants, 12 (55%) identified as male and 10 (45%) identified as female. Data regarding length of stay in United States were obtained from international undergraduates to include: 4.5% (n=1) 2.5 years, 4.5% (n=1) 6 years, 18 % (n=4) 3 years, 18% (n=4) 2 years, 4.5% (n=1) 1 year, 9 % (n=2) less than 1 year, 4.5 % (n=1) 17 months, 18% (n=4) 7 months, 4.5% (n=1) 5 and half years, 9% (n=2) 8 months , 4.5 % (n=1) 6 months or half year.

### **Perception of Harm by Smoking Tobacco**

Tables 1, 2, 3, 4 frequency and percentages for nationality, race/ethnicity, and length of stay, respectively. Of the 22 participants, 12 (55%) identified as male and 10 (45%) identified as female. Participants from different nations were involved in this study which includes: Chinese 10 (46%), Bangladeshi 1 (4.5%), Indian 1 (4.5%), Italian 1 (4.5%), Vietnamese 1 (4.5%), Zimbabwean 1 (4.5%), French 1 (4.5%), Saudi 3 (13%), Korea 1 (4.5%), German 1 (4.5%), Ghanaian 1 (4.5%). Their length of stay in United States are recorded as following: 2.5 years 4.5% (n=1), 6 years 4.5% (n=1), 3 years 18 % (n=4), 2 years 18% (n=4), 1 year 4.5% (n=1), less than 1 year 9 % (n=2), 17 months 4.5 % (n=1), 7 months 18% (n=4), 5 and half years 4.5% (n=1), 8 months 9% (n=2), 6 months or half year 4.5 % (n=1). Of n=22 the race/ethnicity of the participants are reported as: African 9.09%

(n=2), Asian 54.55% (n=12), White 4.55% (n=1), European 9.09% (n=2), Indian subcontinent 4.55% (n=1), Middle Eastern 13.64% (n=3), Self-Identify 4.55% (n=1).

Tables 5, 6, 7 displays results of social influence factors, and respondent's history of tobacco and its current use, respectively. Students were asked if they ever used tobacco before coming to U.S. 31.8% (n=7) reported that they used tobacco before coming to U.S. 68.2% (n=15) reported they haven't used tobacco before coming to U.S. 18.18% (n=4) reported they currently smoke tobacco and 81.82% (n=18) reported that they don't smoke tobacco at present. Participants also reported the following percentages of friends and families who smoke: 90.91% (n=20) and friends who smoke tobacco. 9.09% (n=2) reported that their friends don't smoke tobacco. Participants also reported 68.18% (n=15) of their families who smoke tobacco and 31.82% (n=7) reported that their families don't smoke tobacco.

Table 8 highlights that 63.64% (n=14) have ever used any of the products mentioned above. 4.5% (n=1) reported use of e-cigarette, 9.09% (n=2) reported use of hookah, 27.7% (n=6) reported use of cigarettes, 4.5% (n=1) reported use of cigarillos, 4.5% (n=1) reported use of all the products.

Table 9 shows majority (20%) of surveyed international undergraduate students responded that they smoke cigarettes every day, yet only slightly more than 20% of students smoke hookah less than monthly. More than 75% students reported that they don't smoke cigarettes, 85% students reported that they don't smoke e-cigarettes, 80% reported that they don't smoke hookah.

Students were also asked to rank which product has the most negative impact on the body. 100 percent (n=22) of students ranked cigarette as having the most negative among all

the other tobacco products and 100 percent identified e-cigarette as the product with least negative.

Table 10 provides information regarding the ratings in relation to perceived harm of each of the products. The products perceived to be least harmful to health were e-cigarettes (n=7), hookah (n=1) and cigars (n=1). Most students (n=20) perceived Cigarettes resulting in a lot of harm.

**Table 1. Gender**

| <b>Variable</b> | <b>Frequency</b> | <b>Percentage</b> |
|-----------------|------------------|-------------------|
| Male            | 12               | 55%               |
| Female          | 10               | 45%               |
| <b>Total</b>    | <b>22</b>        | <b>100%</b>       |

**Table 2. Nationality**

| <b>Variable</b> | <b>Frequency</b> | <b>Percentage</b> |
|-----------------|------------------|-------------------|
| Chinese         | 10               | 46%               |
| Bangladeshi     | 1                | 4.5%              |
| Indian          | 1                | 4.5%              |
| Italian         | 1                | 4.5%              |
| Vietnamese      | 1                | 4.5%              |
| Zimbabwean      | 1                | 4.5%              |
| French          | 1                | 4.5%              |
| Saudi           | 3                | 13%               |
| Korea           | 1                | 4.5%              |
| German          | 1                | 4.5%              |
| Ghanaian        | 1                | 4.5%              |
| <b>Total</b>    | <b>22</b>        | <b>100%</b>       |

**Table 3. Race/Ethnicity**

| <b>Variable</b>            | <b>Frequency</b> | <b>Percentage</b> |
|----------------------------|------------------|-------------------|
| <b>African</b>             | 2                | 9.09%             |
| <b>Asian</b>               | 12               | 54.55%            |
| <b>White</b>               | 1                | 4.55%             |
| <b>European</b>            | 2                | 9.09%             |
| <b>Indian subcontinent</b> | 1                | 4.55%             |
| <b>Middle Eastern</b>      | 3                | 13.64%            |

|                      |           |             |
|----------------------|-----------|-------------|
| <b>Self-Identify</b> | 1         | 4.55%       |
| <b>Total</b>         | <b>22</b> | <b>100%</b> |

**Table 4.** Length of Stay

| <b>Duration</b>              | <b>Frequency</b> | <b>Percentage</b> |
|------------------------------|------------------|-------------------|
| <b>2.5 years</b>             | 1                | 4.5%              |
| <b>6 years</b>               | 1                | 4.5%              |
| <b>3 years</b>               | 4                | 18%               |
| <b>2 years</b>               | 4                | 18%               |
| <b>1 year</b>                | 1                | 4.5%              |
| <b>Less than 1 year</b>      | 2                | 9%                |
| <b>17 months</b>             | 1                | 4.5%              |
| <b>7 months</b>              | 4                | 18%               |
| <b>5 and half years</b>      | 1                | 4.5%              |
| <b>8 months</b>              | 2                | 9%                |
| <b>6 months or half year</b> | 1                | 4.5%              |
| <b>Total</b>                 | <b>22</b>        | <b>100%</b>       |

**Table 5.** Friends and Family Members Smoke

| <b>Friends</b>        | <b>Frequency</b> | <b>Percentage</b> |
|-----------------------|------------------|-------------------|
| Yes                   | 20               | 90.91%            |
| No                    | 2                | 9.09%             |
| <b>Total</b>          | <b>22</b>        | <b>100%</b>       |
| <b>Family Members</b> |                  |                   |
| Yes                   | 15               | 68.18%            |
| No                    | 7                | 31.82%            |
| <b>Total</b>          | <b>22</b>        | <b>100%</b>       |

**Table 6.** History of Smoking

|              | <b>Frequency</b> | <b>Percentage</b> |
|--------------|------------------|-------------------|
| Yes          | 7                | 31.8%             |
| No           | 15               | 68.2%             |
| <b>Total</b> | <b>22</b>        | <b>100%</b>       |

**Table 7.** Current Use of Tobacco

|              | <b>Frequency</b> | <b>Percentage</b> |
|--------------|------------------|-------------------|
| Yes          | 4                | 18.18%            |
| No           | 18               | 81.82%            |
| <b>Total</b> | <b>22</b>        | <b>100%</b>       |

**Table 8.** Product Used

| <b>Product</b>       | <b>Frequency</b> | <b>Percentage</b> |
|----------------------|------------------|-------------------|
| <b>E-cigarette</b>   | 1                | 4.55%             |
| <b>Hookah</b>        | 2                | 9.09%             |
| <b>Cigarettes</b>    | 6                | 27.27%            |
| <b>Cigarillos</b>    | 1                | 4.55%             |
| <b>Other specify</b> | 1                | 4.55%             |
| <b>None</b>          | 14               | 63.64%            |
| Total                | <b>22</b>        | <b>100%</b>       |

**Table 9.** Frequency of Product Use

| <b>Cigarette smoking</b> | <b>Frequency</b> | <b>Percentage</b> |
|--------------------------|------------------|-------------------|
| Daily                    | 4                | 20%               |
| Less than monthly        | 1                | 5%                |
| Never                    | 15               | 75%               |
| <b>Total</b>             | <b>20</b>        | <b>100%</b>       |
| <b>E-cigarette</b>       |                  |                   |
| Daily                    | 1                | 5%                |
| Less than monthly        | 2                | 10%               |
| Never                    | 17               | 85%               |
| <b>Total</b>             | <b>20</b>        | <b>100%</b>       |
| <b>Hookah</b>            |                  |                   |
| Less than monthly        | 4                | 20%               |
| Never                    | 16               | 80%               |
| <b>Total</b>             | <b>20</b>        | <b>100%</b>       |

**Table 10.** Perception of harm

| <b>Question</b>   | <b>No Harm</b> | <b>A little harm</b> | <b>Some Harm</b> | <b>A lot of harm</b> | <b>%</b>    | <b>Total</b> |
|---|----------------|----------------------|------------------|----------------------|-------------|--------------|
| <b>How much do you think people harm themselves when they smoke cigarettes every day?</b>                   | <b>0</b>       | <b>0</b>             | 9.09% (2)        | 90.91%(20)           | <b>100%</b> | <b>22</b>    |
| <b>How much do you think people harm themselves when they smoke e-cigarettes every day?</b>                 | <b>0</b>       | 31.82%(7)            | 40.91%(9)        | 27.27%(6)            | <b>100%</b> | <b>22</b>    |
| <b>How much do you think people harm themselves when they smoke hookah every day?</b>                       | 4.55%(1)       | 4.55%(1)             | 27.27%(6)        | 63.64%(14)           | <b>100%</b> | <b>22</b>    |
| <b>How much do you think people harm themselves when they smoke cigars every day?</b>                       | <b>0</b>       | 4.55%(1)             | 18.18%(4)        | 77.27%(17)           | <b>100%</b> | <b>22</b>    |
| <b>How much do you think people harm themselves when they smoke cigarillos' every day?</b>                  | <b>0</b>       | <b>0</b>             | 18.18%(4)        | 81.82%(18)           | <b>100%</b> | <b>22</b>    |
| <b>How much do you think people harm themselves when they smoke cigarettes some days but not every day?</b> | <b>0</b>       | 13.64%(3)            | 50.00%(11)       | 36.36%(8)            | <b>100%</b> | <b>22</b>    |

## **DISCUSSION**

The purpose of this cross-sectional descriptive study was to better understand the perception of international undergraduate students at UW-La Crosse regarding the harm associated with smoking tobacco. According to the survey e-cigarettes were perceived as having the least amount of risk, followed by hookah and cigars, cigarillos, and then cigarettes. Students who perceived a continuum of cigarette-related harm were consistently more likely to perceive e-cigarettes as less harmful than conventional cigarettes compared to those with a consistently high perception of cigarette harm. Such findings suggest that many students may be susceptible to e-cigarette use. Hookah and electronic cigarettes were the most favorably perceived products, which may reflect the effective efforts to market these products as safe and socially acceptable.

E-Cigarettes and Hookah seem to have particularly high appeal among this population, with very high positive perceptions in terms of low perceived harm to health as well as high social acceptability. Furthermore, e-cigarettes and hookah were the most commonly used tobacco products daily and less than monthly.

When it comes to developing, and implementing investigations, potential for barriers to arise. In regards to this study, there will be barriers that will be difficult to overcome. A large barrier that greatly affect the results of this study is having enough number of students that will take the time to accurately fill out the given survey. It is a known fact that students ignore the survey's. Being an international student myself observed that most of the

international students have no idea of how important it is to take the survey's and would ignore survey emails. It is important to let participants know about the importance of taking a part in a study.

### **Recommendations**

Research should be continual on this world wide public health issue. The current findings have implications for research and practice. Further research is needed to understand student's perceptions of both the absolute and relative harmfulness of tobacco products, as well as the relationship between perceptions and product initiation, will help to provide Universities or Colleges with an early warning of the International Undergraduate student's health impact resulting from tobacco product use.

Further research is also needed to understand the potential health consequences and addictive nature of these various tobacco products, particularly hookah and electronic cigarettes. The present study had small number of participants. In order to get more number of participants focus groups must be conducted by advertising on campus to attend providing them with any incentives like asking professors to provide an extra credit for participation or by providing any food coupons etc.

### **Limitations**

This study has certain limitations. A small proportion of respondents might be missing responses to the items/questions concerning cigarette harm perceptions. Although the ordering of the cigarette harm questions was altered so as not to imply graduated risk, some students may have responded with what they believed to be the "correct" answer, rather than what they truly believed. Study was limited to UWL International undergraduate students only.

## CONCLUSION

The results are limited because of the low numbers, which prevents gender, length of stay in the country, nationality comparisons. Also, limits what one can say about perception of harm by UWL international undergraduate students on smoking tobacco.

The present study provides some information regarding perceptions of harm to health by smoking various tobacco products. E-cigarette was generally perceived to be the least harmful, with cigar's and hookah closely following. Cigarettes and cigarillos were perceived as the most negatively and more harmful to health. Future research is needed to document reasons for these perceptions as well as to document the true nature of the health risks. Doing so will inform the development of public health campaigns and interventions to alter these perceptions related to the use of these tobacco products.

*Note: This thesis was prepared according to manuscript guidelines for the Journal of American College Health.*

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APPENDIX A  
EXTENDED LITERATURE REVIEW

## **Review of Literature**

An estimated 1.3 billion people worldwide currently smoke tobacco, with the vast majority of these people smoking manufactured cigarettes. All forms of tobacco are carcinogenic; smoking causes over 16 types of cancer and accounts for about one-fifth of global cancer deaths (Freeman et al., 2014). Smoking accounts for more than 20% of all cancer deaths worldwide. Nearly 40% of the reductions in male cancer death rates between 1991 and 2003 in the USA are thought to be attributed to smoking declines in the last half-century (Freeman et al., 2014).

### **World Wide Use**

In 2012, estimated age standardized Ahmad and colleagues have suggested that the use of crude age groups for comparisons can be misleading due to underlying factors (i.e. biological, psychological etc.) within groups thus, they have worked to create a single age-independent index. This index is meant to represent age-specific rates and address some of the underlying issues with crude age rates. This index has resulted in what has been termed *age standardization*. For example, using this index their research suggests daily smoking prevalence for men and women for the population aged 15 years or older in 187 countries varied (Freeman et al., 2014). Estimated prevalence of daily smoking in men ranged from more than 50% in Armenia, Indonesia, Kiribati, Laos, Papua New Guinea, Russia, and Timor-Leste to less than 10% in Antigua and Barbuda, Dominica, Ethiopia, Ghana, Niger, Nigeria, Sao Tome and Principe, Sudan, and Suriname. Low prevalence among men (<20%) occurred in countries in sub-Saharan Africa and in some developed countries that successfully reduced prevalence (Freeman et al., 2014). Estimated prevalence was very high among men in South, Southeast, and East Asia, with Bhutan the only country with

prevalence lower than 20%. For women, estimated prevalence in 2012 exceeded 30% in Greece, Bulgaria, and Kiribati and was higher than 25% in 7 other countries: Andorra, Austria, Belgium, Chile, France, Hungary, and Macedonia. Conversely, in a few countries, estimated prevalence for women was 1% or lower, including Azerbaijan, Algeria, Cameroon, Eritrea, Ethiopia, Gambia, Lesotho, Libya, Morocco, Oman, Sri Lanka and Sudan (Freeman et al., 2014).

There were also large variations within regions, with Chile and Uruguay having much higher estimated prevalence rates than other countries in Latin America, while Albania, Belarus, Finland, Lithuania, Moldova, Norway, Portugal, Slovenia, Sweden, and Ukraine had much lower estimated prevalence than elsewhere in Europe (Freeman et al., 2014). In Asia, smoking among women in Nepal was comparatively high at 16.9% (95% UI, 14.1%- 19.7%). Oceania, Kiribati, Papua New Guinea, and Tonga had high estimated prevalence among women (>21%) compared with other countries in the region (<16%). In Sweden (percapita income \$47,900 (2015 est.(CIA)). However, where estimated prevalence of daily smoking among men was 12.3% in 2012, daily consumption has increased since 1980. And there was also an increase in the consumption of snus, a form of oral tobacco that may be useful in helping smokers to quit (Freeman et al., 2014).

Although there have been increase in health effects of snus in some countries it appears that there are declines in Sweden. It is likely that the recent trend in this nation will result in reductions in disease burden attributable to tobacco in the coming decades. Several middle-income countries have also attained low prevalence in 2012, including Barbados (percapita income \$16,600 (2015 est.(CIA)). Costa Rica (percapita income \$15,500 (2015 est.(CIA)), and the Dominican Republic (percapita income \$15,000 (2015

est.(CIA), and Panama ( percapita income \$21,800 (2015 est.(CIA), Estimated prevalence of daily smoking in women varied greatly across high-income countries in 2012, from less than 15% in Canada ( percapita income \$45,600 (2015 est.(CIA),Iceland( percapita income \$46,100 (2015 est.(CIA), Israel( percapita income \$33,700 (2015 est.(CIA), and the United States to greater than 26% in Austria, Belgium, Chile, France, and Greece. Female estimated prevalence never exceeded 5% in many middle-income countries, while in others, including Bulgaria, Hungary, and Lebanon (percapita income \$19,100, \$26,200, \$18,200 (2015 est.(CIA), prevalence rates exceeded 20%. Overall, estimated prevalence rates between men and women were weakly correlated. In 2012, 12 countries (including China and Indonesia), with male estimated prevalence greater than 40% and female estimated prevalence lower than 5%, accounted for almost 40% of the world's smokers (Freeman et al., 2014).

Four countries were successful in achieving reductions of greater than 50% in both male and female smoking prevalence since 1980. Canada, Iceland, Mexico, and Norway. Despite progress in reducing prevalence of daily smoking since 1980, the number of smokers has increased steadily worldwide, and there are preliminary indications that global prevalence among men increased in recent years. Although many countries have implemented control policies, intensified tobacco control efforts are particularly needed in countries where the number of smokers is increasing (Freeman et al., 2014).

### **Health Issues and Problems**

Although e-cigarettes are not yet regulated by the Food and Drug Administration, they are often marketed as safer than regular cigarettes (Noland, 2016). Although the long-term health effects of e-cigarettes are not yet known, e-cigarettes deliver toxic chemicals,

including carcinogens, metals, and fine and ultrafine particles, into the lungs and may make bacterial infections resistant to antibiotics (Noland, 2016).

Lung damage may be similar to that caused by conventional cigarette smoke, and e-cigarettes may cause an immediate rise in airway resistance. Hookah smokers experience some of the same diseases as do cigarette smokers, such as cancer, reduced lung function, and decreased fertility (Noland, 2016). A single session of hookah smoking delivers as much tar as a pack of cigarettes. Additionally, various chemicals are emitted through smoking hookah (eg: nicotine, carbon monoxide, arsenic, lead, and carcinogens). Short-term health effects of hookah include carbon monoxide toxicity, resulting in increased emergency room visits, and infectious disease transmission from sharing the mouthpiece (Noland, 2016). College students report higher acceptance of e-smoking in public than traditional tobacco. Similarly, within the general population hookah use is more socially acceptable than cigarette or cigar use (Noland, 2016). Peer use influences the use of cigarettes, e-cigarettes, and hookah among college students. College students who report lifetime hookah use, compared with never users, have a greater number of friends who have tried and approved of hookah and start using to conform to group norms. Few studies on social influences related to e-cigarette or hookah use were found, indicating a need for research (Noland, 2016).

Short-term concerns of smoking include the potential for tuberculosis. Long-term effects of smoking have been associated with lip carcinomas, lung cancer, cardiovascular disease, decreased lung function, chronic obstructive pulmonary disease, and addiction (Martinasek et al 2014). The addictive nature of tobacco, under the guise of the surrounding

misperceptions, may serve to increase uptake of hookah and e-cig smoking among college students (Martinasek et al 2014).

### **International Student Use or Reason for Use**

Findings from the International Tobacco Control (ITC) Surveys covering 10 countries indicate that the use of e-cigarettes has increased substantially globally. Various potential factors have been reported to be associated with e-cigarettes use, including gender, socioeconomic status, parental or friends smoking, and e-cigarettes harm perception and, most importantly, the cigarette smoking status (Wang, M. 2016). Although e-cigarettes may be used as a gateway to cigarette smoking by non-smokers, considerable studies have revealed that most e-cigarettes users are or were cigarette smokers in both adolescents and adults. The relevant literature is increasing rapidly, but to date the effect of cigarette smoking on e-cigarettes use has not been systematically reviewed and quantified (Wang, M. 2016).

Within the U.S many studies have been conducted to gain an understanding of how to decrease youth smoking for instance, studies report family engagement can play a crucial role in youth cigarette use prevention and uptake. At the core of this advocacy have been researchers at the National Center on Addiction and Substance Abuse (CASA). CASA conducted annual surveys of youth (12–17 years) from 1999 through 2011, except for the year 2000. Their measure of family engagement is the frequency with which youth eat their evening meal together with other family members. Results have been fairly consistent across surveys; youth eating family meals together at least five times per week were less likely to participate in high risk health behaviors like alcohol consumption, substance use, or tobacco use. Comparatively, youth reporting eating family meals together infrequently (<3 times a

week) were about four times more likely to smoke (Dietz, 2016). At this point few studies have been conducted to understand parental engagement in other nations. Thus, we have a paucity of information specific to international youth smokers.

### **Adult Use, College Use, & Perception of Harm**

Among U.S. adults ( $\geq 18$  years), cigarettes are the most commonly used tobacco product (Agaku, King, Husten, et al., 2014). Among adult e-cig users, reasons for use most commonly include curiosity, influence of friends or family, to quit/reduce cigarette consumption, and cost (Caponnetto, Campagna, Cibella, et al., 2013; Dawkins, Turner, Roberts, & Soar, 2013; Etter & Bullen, 2011; Goniewicz, Lingas, & Hajek, 2012; Kralikova, Kubatova, Truneckova, Kmetova, & Hajek, 2012; Pepper, Ribisl, Emery, & Brewer, 2014; Vickerman, Carpenter, Altman, Nash, & Zbikowski, 2013). Reasons for use of e-cigs among young adults have not been studied in depth and primarily focus on beliefs or perceptions of e-cigs. In a study of young adults (ages 20–28), about one-half (45%) of those aware of e-cigs agreed the product could help people quit smoking, however, specific reasons for personal use/experimentation with e-cigs were not collected (Choi & Forster, 2013). A Canadian study reported among young adult smokers (16–30 years old) that e-cig users conveyed interest in using e-cigs to quit smoking (80.4%) or, as a replacement for combustible cigarettes (77.8%) (Czoli, Hammond, & White, 2014a).

### **Trends in Hookah Smoking**

Waterpipes (also known as hookahs) are the first new tobacco trend of the 21st century (American Lung Association, 2007). Originating in the Middle East and spreading throughout Europe and the United States. These small, inexpensive, and socially-used tobacco pipes have become as fashionable as cigars were in the later 1990s, especially

among urban youth, young professionals, and college students. Small cafés and clubs that rent the use of hookahs and sell special hookah tobacco are making their mark on the young, hip, urban scene (American Lung Association, 2007). Like many tobacco products, use of these pipes is linked to lung cancer and other respiratory and heart diseases. Waterpipe tobacco smokers are exposed to cancer-causing chemicals and hazardous gases such as carbon monoxide. Waterpipe users are also exposed to nicotine, the substance in tobacco that causes addictive behavior (American Lung Association, 2007). Despite knowing the dangers of waterpipe smoking, one study found that most (more than 90%) beginning waterpipe smokers believe cigarette smoking is more addictive than waterpipe smoking. The same study also found evidence that the use of waterpipes is increasing throughout the world (American Lung Association, 2007).

About one-quarter to one-half of young adults surveyed (both users and non-users) believe e-cigs are safer than tobacco cigarettes (Choi & Forster, 2013; Goniewicz & Zielinska-Danch, 2012; Sutfin, McCoy, Morrell, Hoeppe, & Wolfson, 2013). The perception that a product is less harmful or has benefits over the use of another product has been shown to increase interest in trial (Choi et al., 2012), and there is evidence among young adults, suggesting that those with lower e-cig harm perceptions are more likely to use e-cigs (Czoli, Hammond, & White, 2014b; Saddleson et al., 2015). Despite these beliefs and perceptions about e-cigs, again, there is limited research available about why college students themselves experiment with and/or continue to use e-cigs (Saddleson, 2016).

The waterpipe is used to smoke specially made tobacco by indirectly heating the tobacco, usually with burning embers or charcoal. The smoke is filtered through a bowl of water (sometimes mixed with other liquids such as wine) and then drawn through a rubber

hose to a mouthpiece. Other common names for waterpipes include hookah, narghile or narghila, shisha or sheesha, and hubbly-bubbly. Hookah smoking is commonly viewed as a social activity. Often done in groups of people who share one pipe and try different flavors throughout the evening, hookah smoking is seen as a relatively inexpensive way to “get together” and have fun. The expansion of the hookah bar and café industry, especially in inner cities and near universities and colleges where youth and young adults gather, illustrates the growth potential for hookah marketing and use (American Lung Association, 2007).

### **Trends in E-Cigarette**

Electronic cigarette (e-cigarette) marketing has increased considerably since the product entered the US market in 2007, thereby warranting additional surveillance to monitor recent trends in population-level awareness and utilization. Electronic nicotine delivery systems (ENDS) are battery powered devices that provide doses of nicotine and other additives to the user in an aerosol (King et al, 2015). There are currently multiple types of ENDS available in the US marketplace, including electronic cigarettes, or e-cigarettes, as well as e-hookahs, e-cigars, and e-pipes. Some of these products are disposable varieties, while others can be refilled or recharged for repeated use. Depending on the brand, ENDS typically contain nicotine, a component to produce the aerosol (e.g., propylene glycol or glycerol), and flavorings (e.g., fruit, mint chocolate). Harmful or potentially harmful constituents have also been documented in some ENDS, including tobacco specific nitrosamines, aldehydes, metals, volatile organic compounds, phenolic compounds, polycyclic aromatic hydrocarbons, and tobacco alkaloids, but at lower levels than in conventional cigarettes (King et al, 2015).

Despite uncertainty over the public health impact of ENDS, rapid increases in awareness, experimentation, and recent use have occurred among US adults and youth. During 2010–2011, awareness of e-cigarettes among US adults increased from 40.9% to 57.9%; additionally, ever use of e-cigarettes among US adults increased from 3.3% to 6.2%, with 21.2% of current cigarette smokers reporting that they had ever used e-cigarettes in 2011. Consumer awareness, experimentation, and current use of ENDS are likely influenced by increased advertising for these products; e-cigarette advertising expenditures across multiple media channels—including magazines, television, newspapers, and the Internet—has increased nearly three-fold, from \$6.4 million in 2011 to \$18.3 million in 2012 (King et al, 2015).

### **College Age**

Studies have reported on reasons for e-cig use among young adults. Cigarette smokers among young adults (18–25 years old; smoked  $\geq 1$  cigarette in past month), e-cig use for quitting purposes was more common for those who were more dependent on nicotine and those interested in quitting; reasons for use other than quitting were not asked (Ramo et al., 2015). Among middle, high school and college students in Connecticut, top reasons for experimenting with e-cigs were curiosity (54.4%), appealing flavor (43.8%), and peer influences (31.6%) (Kong, Morean, Cavallo, Camenga, & Krishnan-Sarin, 2014).

Tobacco companies have extensive marketing campaigns for e-cigarette products. While they are not allowed to specifically target youth, the advertisements are often seen by adolescents and may influence experimentation with these products (Couch, Chaffee, Essex,

& Walsh, 2014; Rigotti, Moran, & Wechsler, 2005; Trumbo, 2015). Although regulations have been proposed, currently there are no standing regulations on e-cigarettes by the Food and Drug Administration (FDA). Additional evidence about why young adults are interested in e-cigarettes could aid in informing regulation of these products (Saddleson, 2016).

APPENDIX B  
INSTRUMENTATION

**Perception of Harm in UWL International Undergraduates on Smoking Tobacco  
Questionnaire**

How long have you been in U.S?

Did you ever used tobacco before coming to U.S?

**Yes or No**

Have you used any one of these (Check all that apply)?

- E-cigarette
- Hookah
- Cigarettes
- Cigarillos
- Other specify \_\_\_\_\_
- None

Do you have friends who smoke?

**Yes or No**

Do you have family members who smoke?

**Yes or No**

Do you currently smoke tobacco?

**Yes or No**

How frequently do you smoke cigarettes?

- Daily
- Weekly
- Monthly
- Less than Monthly
- Never
- Don't Know

How frequently do you smoke E-cigarettes?

- Daily
- Weekly
- Monthly
- Less than Monthly
- Never
- Don't Know

How frequently do you smoke Hookah?

- Daily
- Weekly
- Monthly
- Less than Monthly
- Never
- Don't Know

Which of these do you think has more negative impact on your body? Number them 1-5.

1 being most negative and 5 being the least.

- e-cigarette
- cigarette
- hookah
- Cigars
- Cigarillos'

| <p><b>Please answer the questions below using the four-level response scale for each question, Pick one of the following: no harm, little harm (Cough, Mouth sores), some harm (Breathing problems, Asthma), and a lot of harm (Cancer, Heart attack, Lung cancer, Death).</b></p> |          |             |           |                  |
|--|----------|-------------|-----------|------------------|
| Questions  | no harm  | little harm | some harm | a lot of<br>harm |
| 1. How much do you think people harm themselves when they smoke cigarettes every day?  | <b>1</b> | <b>2</b>    | <b>3</b>  | <b>4</b>         |

|  |                 |                 |                 |                 |
|--|-----------------|-----------------|-----------------|-----------------|
| <p>2. How much do you think people harm themselves when they smoke e-cigarettes every day?</p>                 | <p><b>1</b></p> | <p><b>2</b></p> | <p><b>3</b></p> | <p><b>4</b></p> |
| <p>3. How much do you think people harm themselves when they smoke hookah every day?</p>                       | <p><b>1</b></p> | <p><b>2</b></p> | <p><b>3</b></p> | <p><b>4</b></p> |
| <p>4. How much do you think people harm themselves when they smoke cigars every day?</p>                       | <p><b>1</b></p> | <p><b>2</b></p> | <p><b>3</b></p> | <p><b>4</b></p> |
| <p>5. How much do you think people harm themselves when they smoke cigarillos' every day?</p>                  | <p><b>1</b></p> | <p><b>2</b></p> | <p><b>3</b></p> | <p><b>4</b></p> |
| <p>6. How much do you think people harm themselves when they smoke cigarettes some days but not every day?</p> | <p><b>1</b></p> | <p><b>2</b></p> | <p><b>3</b></p> | <p><b>4</b></p> |

Gender:

Nationality:

Country of origin? \_\_\_\_\_

What is your race/ethnicity? (Check all that apply)

- African (Please specify) \_\_\_\_\_
- African American/Black
- Alaska Native (Please specify corporation) \_\_\_\_\_
- Asian (Please specify) \_\_\_\_\_
- Asian American
- Southeast Asian (Please specify) \_\_\_\_\_
- Caribbean/West Indian (Please specify) \_\_\_\_\_
- White
- European (Please specify) \_\_\_\_\_
- Hmong
- Hmong American
- Indian subcontinent
- Latino(a)/Hispanic (Please specify) \_\_\_\_\_
- Middle Eastern (Please specify) \_\_\_\_\_
- Native American Indian (Please specify tribal affiliation) \_\_\_\_\_
- Pacific Islander/Hawaiian Native
- Multiracial (Please specify) \_\_\_\_\_
- Self-Identify \_\_\_\_\_
- Prefer not to identify \_\_\_\_\_

Thank you for your time in completing this survey. Your responses are highly valuable and again will remain confidential.

APPENDIX C  
INFORMED CONSENT

## **INFORMED CONSENT**

**Protocol Title:** Perception of Harm In UW-L International Undergraduates on Smoking Tobacco

**Principal Investigator:** Vaishnavi Paripally, M.P.H Candidate

**Research Contact:** Dr. Dan Duquette  
124 Mitchell Hall  
608-785-8161

### **Purpose and Procedure**

The purpose of this cross-sectional descriptive study is to better understand the perception of international undergraduate students at UW-La Crosse regarding the harm associated with smoking tobacco. Data collection will take approximately 2 months, tentatively beginning by the end of February 25<sup>th</sup> 2017 running through end of March 2017. Subjects will undergo a web-based questionnaire.

Results also may be presented and/or published.

**Potential Risks:** Subjects may be inconvenienced with completing the electronic survey, which estimated to take 15 minutes to complete. Participants who have not completed the survey will receive up to three reminder emails to complete the survey.

**Benefit:** A potential benefit related to this study is the future development of policy or programs to address International undergraduate UWL student's perceptions on smoking tobacco and to address the issues caused by smoking tobacco.

### **Rights and Confidentiality**

You have been selected to participate in this survey assessing the perception of harm regarding smoking tobacco of UWL international undergraduates. Completing this survey is voluntary. By completing this survey, you have agreed to participate in this study. Once you have submitted your survey and responses are recorded, you will be unable to rescind your participation because the surveys are anonymous and thusly untraceable.

### **Questions about the Research or Your Right as a Research Participant**

As the study's principal investigator, please feel free to contact me directly with any questions you may have about the survey or study, Vaishnavi Paripally at [paripall.vaishna@uwlax.edu](mailto:paripall.vaishna@uwlax.edu). Questions regarding the protection of human subjects may be addressed to the UW-La Crosse Institutional Review Board for the Protection of Human Subjects, (608- 785-8124 or [irb@uwlax.edu](mailto:irb@uwlax.edu)). Thank you for your time. Your participation with this study is greatly appreciated.

APPENDIX D

ASSUMPTIONS, DELIMITATIONS, & DEFINITION OF TERMS

## **Assumptions**

It was assumed that all participants answered the questionnaire openly, honestly, and to the best of their ability. An assumption is made that all the participants understand the purpose and content of the survey. It was also assumed that a proportion of the subjects regularly have used or intend to use tobacco products. A final assumption was made that each participant only completed the questionnaire one time.

## **Delimitations**

The study was focused solely on International undergraduate students enrolled during 2017 spring semester at University of Wisconsin-La Crosse. The population was delimited to International Undergraduate students.

## **Definition of Terms**

**Center on Addiction and Substance Abuse (CASA):** The National Center on Addiction and Substance Abuse is a national nonprofit research and policy organization focused on improving the understanding, prevention and treatment of substance use and addiction.

**ENDS:** Electronic nicotine delivery systems (ENDS) are battery powered devices that provide doses of nicotine and other additives to the user in an aerosol.

**Hookah:** Hookahs are water pipes that are used to smoke specially made tobacco that comes in different flavors, such as apple, mint, cherry, chocolate, coconut, licorice, cappuccino, and watermelon.

**Uncertainty intervals(UIs):** Uncertainty intervals (UIs) for prevalence and consumption were based on computation of the results for each of the 1000 draws.

**Estimated Prevalence:** It is an estimate of number of individuals in given population who are smoking tobacco.