Hookah Smoking with Health Risk Perception of Different Types of Tobacco

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Abstract. Hookah is a tobacco product that is gaining popularity in the United States and other countries, particularly among the youth. In this paper, we examine the perception of health risks of different types of tobacco use in comparison to hookah use among 671 participants respond to a survey conducted in Detroit Metropolitan Area, Michigan who never smoke or smoke "cigarette, hookah, both cigarette and hookah"; and determine whether smoking status influenced the perceived health risks of hookah smoking when compared to other forms of tobacco use. The survey had 43 questions including questions about demographics, socioeconomic status, health care, etc. All statistical analyses were done using SPSS version 22. This study found that 44.1% of the participants believed that hookah was less harmful than each of the other tobacco products studied. Approximately 26% of cigarette smokers are likely to smoke hookah also. These findings emphasize the importance of spreading awareness about the health risks associated with hookah smoking and implementing strict laws for showing tobacco-related warnings in hookah advertisements and on the packets of hookah accessories given the increasing popularity of hookah, especially among the youth, in the United States.

Keywords. Chewing tobacco/Snuff/Dip, Cigars/ Cigarillos/Little cigars, Filter cigarettes, Menthol cigarettes.

1. Introduction
Tobacco smoking is a major risk factor for many diseases such as chronic obstructive lung diseases, coronary heart disease, stroke, cancer, chronic bronchitis, and nicotine addiction [1] [2]. Hookah also is known as a water pipe, narghile and shisha [3] [4], is a type of tobacco use that is common in the Middle Eastern and Asian countries [5]. However, it is becoming more common in the US and European countries, especially among youngsters [6] [7] [8] [9] [10], mainly in those of Middle-Eastern [11] [12] [13], and Asian descent [7]. High school and college-aged students have shown a growing interest in hookah [14], as the most socially acceptable and attractive form of tobacco use when compared with cigars and cigarettes [15]. Studies have shown that hookah is considered less addictive [16] [17], and less harmful than cigarettes [17].

It is well documented the health risks of cigarette smoking but not for hookah smoking [18]. Hookah
smoke contains many of the same harmful chemicals in traditional cigarette smoke, including Carbon monoxide, Arsenic, Chromium, Cobalt, Cadmium, Nickel, Formaldehyde, Acetaldehyde, Acrolein, Lead, Polonium 210 [19], Nicotine, Tar, containing polycyclic aromatic hydrocarbons such as benzo (a) pyrene which is react and bind to DNA, resulting several forms of cancer [20][21]. For example, a single hookah-smoking session causes the inhalation of carcinogenic substances in significantly higher quantities than smoking a single cigarette [22]. Another example, it has been shown that hookah smokers have a higher risk for esophageal cancer compared to non-tobacco users [23]. Because hookahs come into direct contact with the mouth and are shared by multiple smokers, infectious diseases of the lungs, mouth, lips, and gums can be spread to other people during a session [24]. Contagious diseases ranging from oral herpes to the flu, and more dangerous illnesses such as tuberculosis and hepatitis [24]. However, smoke emitted from a hookah contains many harmful chemicals, some in higher quantities than in cigarette emissions, which can cause serious health risks to second-hand smokers including workers at hookah lounges and individuals who cohabit with a hookah smoker [25]. The tobacco mixture used in hookah contains molasses and fruit flavours, which cause the hookah smoke to smell fruity and harmless. This, in addition to the belief that the water in the hookah filters the harmful ingredients of tobacco smoke and that hookah smoking is less addictive, may cause the impression that it is relatively harmless compared to cigarettes [16][26][27]. In spite of the fact that studies have shown many harmful effects associated with hookah smoking, the manufacturers of hookah accessories do not diligently display warning labels about the harmfulness of smoking on the packets [28][29]. Advertisements of hookah on the internet also do not usually mention the tobacco-related warning [30].

Many studies have shown that a majority of hookah smokers believed that hookah smoking was less harmful than cigarette smoking [31][6][32][9]. Other factors that were found to influence the perception of risks of smoking include education [33], gender [34] and income [35], also the meaning of smoking risks varies from individual to individual and are influenced by the social and cultural structure of a community [36].

The cigarette is a common tobacco product against which other tobacco products are compared. There are many studies comparing the perception of risks of hookah smoking to cigarette smoking [6][31][32]. In this study, the participants were asked to rate the harmfulness of smoking hookah versus chewing tobacco/snuff/dip, cigars/cigarillos/little cigars, cigarettes, filter cigarettes, and menthol cigarettes. Therefore, the objectives of this study were: (1) To explore the characteristics of study groups who smoke (a) hookah only, (b) cigarette only, (c) both hookah and cigarette and (d) never smoke by survey variables. (2) To determine the prevalence of study groups by survey variables. (3) To examine the perception of health risks of different types of tobacco smoking (a) chewing tobacco/snuff/dip, (b) cigars/cigarillos/little cigars, (c) cigarette (d) filter cigarettes, and (e) menthol cigarettes, when compared to hookah smoking.

2. Study population and setting

This study was conducted in a convenient sample in Detroit Metropolitan Area, Michigan, and was approved by the Institutional Review Board of Wayne State University. A survey was administered in paper forms among adults from 1st January to 30th June 2010. Flyers and information sheets explaining the importance of the study and enhancing community people to participate voluntarily in the study through contact information prepared. A research assistant (RA) distribute flyers to Churches and Mosques, while he disseminates flyer and information sheet to cafes of four community colleges, primary health clinics, and dental clinics. The manager of three dental and two primary healthcare clinics accept to collaborate in the study and to disseminate the flyer and information sheet to their clients, then those who show interest voluntarily, survey questionnaires without any identifiers will be given to them and the manager will keep all the completed survey with hi as RA plan to visit the clinics one day per week to collect the survey questionnaires from the clinic manager. The research assistant (RA) was visiting the cafes of community colleges two days per week, giving survey questionnaires’ (which did not ask for name or address of participants) to those who showed interest in the study and he was waiting in the cafe.
to get the survey back from them. All completed survey was handed directly to the RA who took them to the principal investigator of the project at Wayne State University who kept all completed surveys locked in cabinet in his office only to be accessed by him or the RA for data entry or review. The final study populations which were considered for this study were 671 individuals who answered most of the questionnaire on the hard copy of the survey as we excluded the 209 webpage survey on the recommendation of one of the reviewers. Also, 85 surveys were excluded because of missing several questions in particular smoking status question, also 38 Asian Americans were excluded because only one was a hookah smoker. The study participants were residents in 156 zip codes of Michigan. 40.5% of participants were Chaldean and 32.8% were Arab, the remaining 26.7% were Black, White and Hispanic. So, we combined the races, black, white and Hispanic to form a category called non-Middle Eastern group. The survey had 43 questions including questions about demographics (such as age); socioeconomic status (such as education); and health care (such as insurance status). Also, there were several other questions used in another study. Tobacco categories were determined from the answers to the question, ‘If you currently smoke what you smoke?’ The answer was one of the following: (a) cigarettes, (b) hookah, (c) both, and (d) never smoke. Base on that the study populations were classified into four groups according to their smoking status. There were five questions concerning health risk perception as follow (a) How would you rate the health risks of chewing tobacco/snuff/dip, compared to hookah smoking?, (b) How would you rate the health risks of cigars/cigarillos/little cigars compared to hookah smoking?, (c) How would you rate the health risks of cigarette smoking compared to hookah smoking?, (d) How would you rate the health risks of cigarettes with filters compared to hookah smoking?, (e) How would you rate the health risks of cigarettes with menthol, compared to hookah smoking?. The answer to these questions was as follows (1) I don’t know, (2) Less dangerous, (3) Equally as dangerous, and (4) More dangerous. These answers were modified as follows: answer (1) was deleted, answer (2) was kept as it is and called “< harmful”, answer (3) and (4) were combined and called “≥ harmful”. Thus the binomial variable for each question comparing the health risks of each type of tobacco to hookah smoking was created with the categories “≥ harmful” (giving “1” to it) and “<harmful (giving “0” to it).

3. Statistical analyses
All statistical analyses were done using SPSS version 22. A chi-square test was used to test differences between study groups and different variables. We performed five binary logistic regressions analysis to identify variables affecting the perception of health risks of each type of smoking in relation to hookah smoking. Then we combined the answer of the five questions of perception which end in a new variable with a score range from 0 to 5 (higher mean more harmful and it will be used as dependent variable), then we perform a linear regression to predict the variables for health risk perception. Kolmogorov-Smirnov test was done to test for normality of the variable and it showed that the distribution was not normal.

4. Characteristics of the sample
The characteristic of 671 participants was presented in (table 1) which reveals the mean and standard deviation (SD) of the age of participants [37.3 ± (15.7) year], with the number and percentage of all other variables. There were significant differences (p < 0.05 to p < 0.001) between the four study groups and age, gender, ethnicity, marital status, employment status, and income variables. The prevalence rate of tobacco smoke among the study population was 38.9%, while those who smoke hookah only were 8.8%, cigarette only 14.5% and those who smoke both 15.6%, other prevalence rates of sub-variables are listed in the table. Table 2 Shows risk perceptions of hookah smoking compared to other forms of tobacco use according to smoking status (frequency and percentage based on available response). Only significant differences were found in the perception of health risk for Chewing tobacco/Snuff/Dip (p < 0.001) and a cigarette (p < 0.05) in relation to hookah smoke across the four study groups as well as when all types of tobacco were combined. However, 44.1% of the participants believed that hookah was less harmful than each of the other tobacco products studied (range between 28.2-16.9%). Table 3 shows the results of five
binomial logistic regressions analysis to predict the perception variables of ≥ harmful risk factors for each type of tobacco. The predicted variables were varied when examined each of these five equations analysis. Some variables share equations e.g. those who do not do regular exercise were health risk factors in 4 out of 5 equations analysis while some participants who were married, student (sub variable of employment status) and do not have health insurance shows once within the five equations. Linear regression analysis (table 4) was used for the combined perceptions of health risk factors of the five types of tobacco in relation to hookah smoke as a dependent variable (< harmful vs. ≥ harmful). The mean of the continuous variable for risk perception was 3.17 and the SD was 1.80. Results reveal that the health risk factors among those who smoke any type of tobacco compared to hookah smoke were among participants who born in US, female, married, hold a high school or less and do not do regular exercise. On average, hookah-only smokers were younger than the other three groups.

5. Discussion
The results of the study (table 1) reveal the prevalence rate of tobacco smoking, irrespective of its types, among the study population, was 38.9%, those who smoke hookah only shows the lowest (8.8%) prevalence compare to those who smoke cigarette only (14.5%) or those who smoke both (15.6%), which is less than the prevalence of cigarette smoking among Michigan population according to Behavioral Risk Factor Surveillance System (BRFSS, 2010). Since the majority of the study population was Middle Eastern (Arab and Chaldean), the prevalence of hookah smoking was higher among Chaldean (12.9%) and Arab (8.6) compare to Non-Middle Eastern group (2.8%). However, the prevalence of hookah was higher among students (16.9%), youth age 18-24 years (15%), hold high school and more (9.8%), born in US (7.7%), marital status single (12.2%), income more than $20,000 (10.8%) and those who do regular exercise (9.6%), and female (8.9%). This result is comparable to the result of another study that showed that hookah is considered more attractive and acceptable than some other tobacco products [15]. Also, it was clear that the perception of health risk was less harmful in hookah smoking compared to the smoking behaviour of participants with different types of tobacco use (table 2). It is of interest to notice that 24 out of 25 possibilities of the responders of the survey thought that hookah was less harmful than all the other types of tobacco products studied. In general, 88.4% of total participants considered hookah to be less harmful than and any other types of tobacco product when we combined the five perceptions, it is of interest to find 68.1% of total participants who smoke filter cigarettes respond that health risk from smoking hookah was less than any other types of tobacco although the range of percentage between the study groups was varied. This is similar to another study on hookah smokers which reveals that 58.3% of the participants believed that hookah smoking was less harmful than cigarette smoking [26]. This is in the agreement of other studies that have shown that those who smoked hookah were likely to have a lower perception of harm from hookah smoking [31][9].
This is interesting because filter cigarettes have filters in them and it is a common belief that the water in hookah would filter the harmful substances in tobacco smoke; hence, both of them may seem to have similar health risks. The reason that the responders felt hookah to be less harmful than filter cigarettes maybe because the molasses and fruit flavor in hookah cause the smoke to seem relatively harmless. Examining the variables predictors of perception health risk factors for likelihood of ≥ harmful for each type of tobacco in comparison to hookah smoke using binary logic regression analysis (table 3) reveal the following: It is similar to another study by Bombard et al. (2007) [37] that showed that 26% of male cigarette smokers are concurrent users of other tobacco products. Cigarette-only smokers also did not show any significant difference in their perception of harm compared to nonsmokers.

Other factors that were associated with a lower perception of harm were being unemployed and exercising at least once per week. This is interesting because exercising at least once per week is healthy behavior and those who chose that behavior would be expected to have better knowledge about the health risks
associated with hookah smoking. Those who were age 45 to 54 years were likely to rate the health risks of hookah as more harmful than those age 55 and above. Gender, marital status, education, income, and insurance status did not have an effect on the perception of harm when adjusted for other factors. When adjusted for other factors, Middle-Eastern ethnicity also did not have an effect on the rating of health risks of hookah. It is interesting because those of Middle-Eastern descent are more likely to be exposed to hookah use in their homes and community.

6. Limitations
The study was based on self-reported smoking behaviors. Hence there can be reporting bias. There were many participants who responded ‘I don’t know’ to the questions about risk perceptions (chewing tobacco/snuff/dip 21.6%, cigars/cigarillos/little cigars 15.6%, cigarettes 16.7%, filter cigarettes 13.9%, and menthol cigarettes 15.1%). The reason for that response might have been because most did not know much about the different types of tobacco products. The survey did not ask whether the participants used any form of tobacco other than hookah and cigarettes. Another limitation is that this is a cross-sectional study and hence we cannot determine whether the perceptions led to the smoking behavior or the smoking habits led to developing the perceptions.

7. Recommendation
Health care providers should be made aware that cigarette smokers have a high likelihood of using other tobacco products such as hookah, and tobacco cessation counseling should address that issue. This finding raises the concern that hookah smoking is likely to become more popular if the public is not made aware of the health risks associated with it.

8. Conclusions
This study found that hookah is considered to be less harmful than many other tobacco products including cigarettes irrespective of the smoking status of the participants. Approximately 26% of cigarette smokers are likely to smoke hookah also and those who smoke both hookah and cigarettes are more likely to have lower risk perceptions about hookah smoking than nonsmokers. These findings emphasize the importance of spreading awareness about the health risks associated with hookah smoking and implementing strict laws for showing tobacco-related warnings in hookah advertisements and on the packets of hookah accessories given the increasing popularity of hookah, especially among the youth, in the United States.
| Variable | Never Smoke n=410(61.1) | Cigarettes only n=97(14.5) | Hookah only n=59(8.8) | Both n=105(15.6) | Total# n=671(100) |
|----------|------------------------|-----------------------------|------------------------|-------------------|-------------------|
| Age [Mean (SD)] | 37.7(16.1) | 40.9(14.9) | 31.3(15.0) | 36.1(14.5) | 37.3(15.7) |
| Main variable | | | | | |
| 18-24 Y | No.(%) | No.(%) | No.(%) | No.(%) | No.(%) |
| Age Group*** | 25-44 Y | 152(58.7) | 41(15.8) | 19(7.3) | 47(18.2) | 259(38.6) |
| 44 +Y | 141(64.4) | 37(16.9) | 11(5.0) | 30(13.7) | 219(32.6) |
| Gender*** | Female | 233(71.7) | 31(9.5) | 29(8.9) | 32(9.8) | 325(48.4) |
| Male | 177(51.2) | 66(19.1) | 30(8.7) | 73(21.1) | 346(51.6) |
| Chaldean | 166(61.0) | 24(8.8) | 35(12.9) | 47(17.3) | 272(40.5) |
| Ethnicity*** | Non Middle-Eastern | 119(66.5) | 49(27.4) | 5(2.8) | 6(3.4) | 179(26.7) |
| Place Born*** | Outside US | 209(58.1) | 67(18.6) | 35(9.7) | 49(13.6) | 360(53.7) |
| In US | 201(64.6) | 30(9.6) | 24(7.7) | 56(18) | 311(46.3) |
| Marital Status** | Single | 218(59.2) | 51(13.9) | 45(12.2) | 54(14.7) | 368(55) |
| Married | 192(63.4) | 46(15.2) | 14(4.6) | 51(16.8) | 303(45) |
| ≤ H.S. | 159(60.7) | 36(13.7) | 19(7.3) | 48(18.3) | 262(39) |
| Education | H.S. + | 251(61.4) | 61(14.9) | 40(9.8) | 57(13.9) | 409(61) |
| Student | 75(57.7) | 10(7.7) | 22(16.9) | 23(17.7) | 130(19.4) |
| Employment Status*** | Unemployed | 100(66.6) | 25(16.7) | 7(4.7) | 18(12) | 150(22.3) |
| Employed | 235(60) | 62(15.9) | 30(7.7) | 64(16.4) | 391(58.3) |
| Income*** | ≥ $20,000 | 264(59.3) | 63(14.2) | 48(10.8) | 70(15.7) | 445(66.3) |
| < $20,000 | 146(64.6) | 34(15) | 11(4.9) | 35(15.5) | 226(33.7) |
| Health insurance | No | 117(61.5) | 29(15.3) | 14(7.4) | 30(15.8) | 190(28.3) |
| Yes | 293(60.9) | 68(14.1) | 45(9.4) | 75(15.6) | 481(71.7) |
| Exercise regularly | No | 224(64.7) | 43(12.5) | 28(8.1) | 51(14.7) | 346(51.6) |
| Yes | 186(57.2) | 54(16.6) | 31(9.6) | 54(16.6) | 325(48.4) |

# Ignoring the column ‘Total’, the sum of percentages across each row is 100
*P < 0.05, **P < 0.01, ***P < 0.001
Table 2. Risk perceptions of hookah smoking compared to other forms of tobacco use according to smoking status (No. & % based on available response).

| Types of tobacco smoking | Perception | Never Smoke / n=410 (61.1) | Cigarettes only / n=97 (14.5) | Hookah only / n=59(8.8) | Both / n=105 (15.6) | Total / n=671 (100) |
|--------------------------|------------|-----------------------------|-----------------------------|------------------------|---------------------|---------------------|
|                         |            | N0. (%)                     | N0. (%)                     | N0. (%)                | N0. (%)             | N0. (%)             |
| Hookah vs. Chewing tobacco/Snuff/Dip *** | < harmful | 80 (27.2)                   | 36 (46.8)                   | 19 (39.6)              | 33 (39.3)           | 168 (33.4)          |
|                         | ≥ harmful | 214 (72.8)                  | 41 (53.2)                   | 29 (60.4)              | 51 (60.7)           | 335 (66.6)          |
| Hookah vs. Cigars/ Cigarillos/Little cigars | < harmful | 126 (38.5)                  | 32 (41.6)                   | 24 (45.3)              | 47 (51.6)           | 229 (41.8)          |
|                         | ≥ harmful | 201 (61.5)                  | 45 (58.4)                   | 29 (54.7)              | 44 (48.4)           | 319 (58.2)          |
| Hookah vs. Cigarettes*  | < harmful | 119 (35.8)                  | 16 (21.1)                   | 17 (32.7)              | 38 (40.4)           | 190 (34.3)          |
|                         | ≥ harmful | 213 (64.2)                  | 60 (78.9)                   | 35 (67.3)              | 56 (59.6)           | 364 (65.7)          |
| Hookah vs. Filter cigarettes | < harmful | 119 (34.5)                  | 16 (20.3)                   | 14 (29.8)              | 32 (33)             | 181 (31.9)          |
|                         | ≥ harmful | 226 (65.5)                  | 63 (79.7)                   | 33 (70.2)              | 65 (67)             | 387 (68.1)          |
| Hookah vs. Menthol cigarettes | < harmful | 61 (18.2)                   | 14 (17.7)                   | 11 (23.9)              | 17 (17.7)           | 103 (18.5)          |
|                         | ≥ harmful | 274 (81.8)                  | 65 (82.3)                   | 35 (76.1)              | 79 (82.3)           | 453 (81.5)          |
| All 5 types combined    | < harmful | 40 (11.3)                   | 7 (8.6)                     | 11 (20.8)              | 10 (10.2)           | 68 (11.6)           |
|                         | ≥ harmful | 315 (88.7)                  | 74 (91.4)                   | 42 (79.2)              | 88 (89.8)           | 519 (88.4)          |

* P < 0.05, ** P < 0.01, *** P < 0.001
Table 3. Binary logistic regression analysis with means of combined individual risk perception of hookah smoking versus other forms of tobacco use as the dependent variable.

| Predicting Risk Factors | B     | Sig.   | Exp(B) | 95% C.I. for EXP(B) |
|-------------------------|-------|--------|--------|---------------------|
|                         |       |        |        | Lower               | Upper  |
| Likelihood for having more dangerous Chew Snuff compare to hookah |       |        |        |                     |        |
| Female                  | 0.90  | 0.000  | 2.46   | 1.55                | 3.91   |
| Student vs. Employed (Ref) | -0.64 | 0.037  | 0.53   | 0.29                | 0.96   |
| No exercise             | 0.61  | 0.008  | 1.85   | 1.18                | 2.91   |
| No health insurance vs. have(Ref) | -0.54 | 0.036  | 0.58   | 0.35                | 0.97   |
| Likelihood for having more dangerous Cigar Cigarillo Little cigar compare to hookah |       |        |        |                     |        |
| Age in Years (continuous) | -0.02 | 0.034  | 0.98   | 0.97                | 1.00   |
| Arab vs. Non Middle-Eastern (Ref) | -0.79 | 0.014  | 0.46   | 0.24                | 0.85   |
| Born in US              | 0.56  | 0.030  | 1.76   | 1.05                | 2.93   |
| No exercise             | 0.76  | 0.000  | 2.13   | 1.41                | 3.23   |
| Likelihood for having more dangerous cigarette compare to hookah |       |        |        |                     |        |
| Participant smoke cigarette only | 0.84  | 0.043  | 2.31   | 1.03                | 5.20   |
| Ethnicity Groups        | 0.020 |        |        |                     |        |
| Chaldean vs. Non Middle-Eastern (Ref) | -0.78 | 0.030  | 0.46   | 0.23                | 0.93   |
| Arab vs. Non Middle-Eastern (Ref) | -0.97 | 0.005  | 0.38   | 0.19                | 0.75   |
| H.S. or less vs. H.S. + | -0.47 | 0.027  | 0.63   | 0.41                | 0.95   |
| No exercise             | 0.49  | 0.026  | 1.63   | 1.06                | 2.51   |
| Likelihood for having more dangerous cigarette with filter compare to hookah |       |        |        |                     |        |
| Arab vs. Non Middle-Eastern (Ref) | -0.73 | 0.037  | 0.48   | 0.24                | 0.96   |
| Born in US              | 0.61  | 0.028  | 1.85   | 1.07                | 3.19   |
| Single vs. Married (Ref) | -0.52 | 0.025  | 0.60   | 0.38                | 0.94   |
| H.S. or less vs. H.S. + | -0.74 | 0.001  | 0.48   | 0.31                | 0.72   |
| Student vs. Employed (Ref) | 0.69  | 0.033  | 2.00   | 1.06                | 3.76   |
| Income $20,000 + vs. ≤ $20,000 | -0.60 | 0.018  | 0.55   | 0.34                | 0.90   |
| No exercise             | 0.53  | 0.019  | 1.69   | 1.09                | 2.63   |
| Likelihood for having more dangerous cigarette with menthol compare to hookah |       |        |        |                     |        |
| Age in Years (continuous) | 0.03  | 0.003  | 1.03   | 1.01                | 1.05   |
| Female                  | 0.56  | 0.030  | 1.75   | 1.06                | 2.89   |
| Born in US              | 0.66  | 0.046  | 1.93   | 1.01                | 3.69   |
| Income $20,000 + vs. ≤ $20,000 | -0.65 | 0.034  | 0.52   | 0.29                | 0.95   |

Variable(s) entered equation: Study Population, Age in Years, Gender, Ethnicity, Place of birth, Marital status, Education, Employment status, Income, Exercise regularly and health insurance.
Table 4. Linear regression analysis to predict risk factors for combine perceptions of smoking different types of tobacco concerning compare to hookah smoking.

| Likelihood for have more dangerous health risk compare to hookah | Standardized Beta | t    | Sig.  | 95.0% C.I. for B | Partial |
|---------------------------------------------------------------|-------------------|------|-------|-----------------|--------|
| Male vs Female (Ref)                                          | -0.09             | -2.05| 0.041 | -0.66           | -0.01  |
| Born outside US vs In Us (Ref)                                | -0.17             | -3.16| 0.002 | -1.00           | -0.23  |
| Married vs Single (Ref)                                       | 0.10              | 2.20 | 0.028 | 0.04            | 0.72   |
| ≤ H.S. vs. H.S. + (Ref)                                       | 0.10              | 2.22 | 0.027 | 0.04            | 0.67   |
| Exercise vs. No exercise (Ref)                                | -0.09             | -1.97| 0.050 | -0.63           | 0.00   |

Variable(s) entered equation: Study Population, Age in Years, Gender, Ethnicity, Place of birth, Marital status, Education, Employment status, Income, Exercise regularly and health insurance.

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