

# Factors that Influence Smoking among Middle Eastern College Women in the United States

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# Disclosures

Disclosures	
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# Smoking Among Women & College Students

- Cigarette smoking is a leading cause of preventable disease, disability, and death in the US
- Smoking rates among immigrant women
  - Europe (17%), Russia (16% ), Southeast Asia (15%), North Africa (10%)
- Smoking rates among college-age adults (22-23yrs)
  - In 2020 (43% which increased from 20%)
- Predicted # of female smokers by 2025
  - more than 500 million worldwide
- Young adults 18-24 years, college age,
  - account for > 55% of Hookah smokers in the US
- Hookah smoking is disproportionately higher among
  - college students of Middle Eastern Arab descent (62%), compared to non-Arab students (11%)

# Smoking in Middle Eastern College Women

- Little is known about smoking among immigrant college students in the United States, particularly Middle Eastern college women
- Middle Eastern women are stigmatized for tobacco use, which contributes to their restricted use in public spaces
  - In the context of family, cigarette smoking is forbidden among daughters
- Globally, Hookah phenomenon has become increasingly popular
  - Less social stigma is associated with hookah smoking compared to cigarette smoking

# Population of Interest



- **Arabs** (individuals from Arabic speaking countries) are from 2 regions:
  - **Middle East** - Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, United Emirates, and Yemen
  - **North Africa** - Algeria, Libya, Morocco, and Tunisia
- **Middle Easterners from non-Arabic Countries** are from:
  - Iran, Israel, and Turkey

# Factors that Influence Smoking Behaviors

- Demographic/education/SES factors
- Acculturation (heritage/mainstream)
- Social support
- Psychosocial stress
- Experiences of discrimination
- Religiosity
- Patriarchal beliefs (attitudes towards women and sexuality)
- Access to care factors

# Study Purpose & Research Questions

- **Study purpose:**
  - To examine determinants of cigarette and Hookah smoking behaviors among Middle Eastern college women in the US.
- **Research Questions:**
  1. Are **smoking behaviors** associated with ***individual factors*** (e.g., *age, marital status, immigration generation status, religious affiliation, etc.*)?
  2. Are **smoking behaviors** associated with ***sociocultural factors*** (e.g., *social support, perceived discrimination, religiosity, acculturation, and patriarchal beliefs*)?
  3. Are **smoking behaviors** associated with ***access to care factors*** (e.g., *having a healthcare provider, health insurance, and access to health information*)?

# Methods

- Cross-sectional design, using an anonymous, web-based survey on REDCap
- Middle Eastern student collaborators - focus group meeting to:
  - Refine survey for clarity and cultural relevance
  - Identify effective recruitment strategies
- Study Sample:
  - ***406 participants***
  - Power analysis done to ensure adequate sample size
  - Eligibility: 18 years of age or older, enrolled in college or graduated within 6 months, Middle Eastern/Arabic background, 1<sup>st</sup> or 2<sup>nd</sup> generation immigrant or on a student visa



# Data Analysis

- Descriptive univariate analysis
- Bivariate analysis (chi-square & t-test)
- Multivariate logistic regression analysis
  - Hierarchical in 3 blocks
    - Individual, sociocultural, and access to care
  - Stepwise approach (Backward Wald)
    - To eliminate non-significant predictors

Characteristics of Study Sample (N=406)	%
Age 21 years or less	72%
Born in United States	80%
Full-time college student	85%
Undergraduate student	80%
Working (part time/full time)	53%
Health insurance private/university	83%
Single status	70%
Muslim Religion	65%
Daily interactions with both ME and non-ME students	47%
Belonging to student organizations	36%
Belonging to community/religious organizations	67%
<b>Cigarette smoking daily or some days</b>	<b>21%</b>
<b>Hookah smoking daily or some days</b>	<b>20%</b>

# Hierarchical Logistic Regression Analysis

## Block 1: Individual Predictors

(e.g., age, marital status, country of birth, religious affiliation, student status, reasons for immigrating to the US, belonging to student or community/religious organization, etc.)

	Cigarette Smoking	Hookah Smoking
Variability predicted (R <sup>2</sup> )	4.9% - 7.5%	11.2% - 17.6%
Significant Predictors	Odds of Cigarette Smoking	Odds of Hookah Smoking
Being Muslim	<i>There were no significant individual predictors for cigarette smoking</i>	Doubled the odds
Belonging to student organizations		Doubled the odds
Daily interactions with an equal mix of ME & non-ME students		Increased the odds by 45%
Born in US		Decreased the odds by 60%
Being PT student		Decreased the odds by 74%

# Hierarchical Logistic Regression Analysis

## Block 2: Sociocultural Predictors

(e.g., acculturation, social support, perceived stress, perceived discrimination, religiosity, and attitudes towards women and sexuality)

	Cigarette Smoking	Hookah Smoking
Variability predicted ( $R^2$ )	7.1% - 10.9%	7.1% - 11.3%
Significant Predictors	Odds of Cigarette Smoking	Odds of Hookah Smoking
Higher <i>heritage</i> acculturation	---	Doubled the odds
More liberal attitudes towards women	---	Doubled the odds
More liberal beliefs toward sexuality	Doubled the odds	---
Higher religiosity levels	---	Decreased the odds by 45%

# Hierarchical Logistic Regression Analysis

## Block 3: Access to Care Predictors

(e.g., having health insurance, having a primary HCP, visited a HCP in past year, and source of health information)

	Cigarette Smoking	Hookah Smoking
Variability predicted ( $R^2$ )	2.6% - 4.0%	2.3% - 3.7%
Significant Predictors	Odds of Cigarette Smoking	Odds of Hookah Smoking
Having a Primary HCP	Decreased the odds by 45%	<i>There were no significant access to care predictors for Hookah smoking</i>

# Stepwise logistic regression analysis of predictors for **cigarette smoking**, using backward Wald method

To merge all 3 blocks and eliminate non-significant predictors

Cigarette Smoking (N=344)							
Surviving Predictors	B	SE	Wald	df	Sig.	Exp(B)	95% CI
Acculturation-Heritage Score	-0.356	0.200	3.161	1	0.075	0.701	0.473-1.037
<b>Beliefs Toward Sexuality Score</b>	0.566	0.237	5.721	1	<b>0.017</b>	<b>1.761</b>	<b>1.108-2.800</b>
<b>Have a primary HCP (Yes vs. No)</b>	-0.747	0.298	6.298	1	<b>0.012</b>	<b>0.474</b>	<b>0.264-0.849</b>
Obtain health information from the internet (Yes vs. No)	-0.453	0.275	2.722	1	0.099	0.636	0.371-1.089
Constant	-0.676	0.972	0.484	1	0.487	0.508	
Omnibus Tests of Model Coefficients	Chi-square=25.075; df=4; P<0.001						
Model Summary	-2 Log likelihood=340.723 Cox & Snell <b>R<sup>2</sup>=6.9%</b> ; Nagelkerke <b>R<sup>2</sup>=10.7%</b>						

# Stepwise logistic regression analysis of predictors for Hookah smoking, using backward Wald method

To merge all 3 blocks and eliminate non-significant predictors

Hookah Smoking (N=352)							
Surviving Predictors	B	SE	Wald	df	Sig.	Exp(B)	95% CI
<b>Religion</b> ( <i>Muslim vs. Christian</i> )	0.713	0.339	4.423	1	<b>0.035</b>	<b>2.040</b>	<b>1.050-3.964</b>
<b>Student attendance status</b> ( <i>Part-time vs. Full-time</i> )	-1.207	0.547	4.863	1	<b>0.027</b>	<b>0.299</b>	<b>0.102-0.874</b>
<b>Acculturation-Heritage Score</b>	0.480	0.224	4.593	1	<b>0.032</b>	<b>1.616</b>	<b>1.042-2.506</b>
<b>Attitudes towards Women Score</b>	0.904	0.278	10.546	1	<b>0.001</b>	<b>2.468</b>	<b>1.431-4.259</b>
<b>Constant</b>	-4.728	1.407	11.286	1	<0.001	0.009	
<b>Omnibus Tests of Model Coefficients</b>	Chi-square=25.858; df=4; P < 0.001						
<b>Model Summary</b>	-2 Log likelihood=328.532 Cox & Snell <b>R<sup>2</sup>=7.1%</b> ; Nagelkerke <b>R<sup>2</sup>=11.1%</b>						

# Discussion

- The effect of being Muslim demonstrates the influence of cultural-religious norms of the Middle Eastern population on Hookah smoking behavior
- Being born outside the US, attending college full-time, and belonging to student organizations present a strong negative social influence that increases Hookah smoking behavior
- Higher levels of heritage culture had a negative effect by increasing the rates of Hookah smoking
- Hookah bars/cafes are growing exponentially around college campuses



# Discussion

- The effect of having liberal views towards women and sexuality on increasing smoking behaviors could be a negative part of the female students' transition into college and gaining independence in college
- Religiosity being a protective factor against Hookah smoking, possibly through adhering to more conservative behaviors
- Having a primary HCP is a protective factor against cigarette smoking, possibly through its influence on promoting healthy behaviors and leading a healthy lifestyle

# Implications for Practice & Research

- The need for expand college health & student services
  - Targeted programs/intervention to address risky health behaviors among ME women on college campuses
  - Education on Hookah smoking for college students
  - Extending programs/interventions to the community
    - Community health centers, women's health centers, private practices, cultural and religious organizations
- Future research
  - Using qualitative approaches to understand the mechanisms of influence for the predictors on health behaviors in this population
  - Developing and testing intervention strategies

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