

**How does religiosity influence the health awareness and health behaviors of Muslim American women?**

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## **Abstract**

The purpose of this study was to evaluate the modesty of Muslim American women as a predictor of health behaviors among this population. Specifically, this study investigated what factors influence religious modesty and more significantly, how this modesty influences the health attitudes, awareness, education, and behaviors of Muslim women living in the U.S. An online survey instrument of 96 questions was created and distributed to Muslim women in the Midwest through email listservs. 319 women were surveyed and 252 completed the survey. After creating an index of modesty and using bivariate and multivariate statistics to analyze the data, I found that level of modesty was significantly associated with several health behaviors variables including preference for female and Muslim physicians, ever having/ recently having a pelvic exam, and exercise ( $p < 0.05$ ). These findings have important implications and must be further studied so that the medical community can be informed about the specific needs of Muslim American women and the importance of culturally-sensitive health practices.

## **Introduction**

Recently the Pew Forum on Religion and Public Life released a first-of-its-kind study about Muslim American demographics and attitudes. According to the study, around 1.4 million Muslim adults currently live in the United States, 65% of who are foreign-born (Pew Research Center 2007). Many of these Muslims immigrated to the United States as professionals, and as a result, their levels of education and income are comparable to those of non-Muslim Americans. However, although Muslim Americans may be comparable to their non-Muslim counterparts in terms of education and income, about 72% still consider religion to be an important aspect of their lives, as compared to 60% of Christian Americans (Pew Research Center 2007). An important question to ask then is how religion affects the lives of Muslim Americans. Here I consider how religion affects Muslim American women's modesty and more specifically, how this religiously-defined modesty influences health attitudes and health behaviors. There is limited evidence suggesting that Muslim women are less likely to be screened for life-threatening diseases, such as breast cancer, but these findings stem predominantly from clinical work. I have sought to combine health research with sociological approaches in order to understand Muslim women's health behaviors, attitudes, and beliefs, in their social contexts. This research is significant in that it provides quantitative statistics on the health behaviors of a large group of Muslim women living in the United States. Furthermore, the study helps to identify underlying factors that may be influencing the healthcare decisions of these women. The findings of this research can be used to inform the medical community about Muslim women's healthcare behaviors, attitudes, and education, and to help improve their interactions with this population. Finally, this study may help to spark more hypothesis-driven research about the health behaviors of this population.

## **Question**

Figure 1 depicts the conceptual framework of this study. Because there is a paucity of empirical data available about the modesty and health of Muslim American women, it is difficult to couch hypotheses of this study in existing literature. In this study my research centers around three main questions: 1) What demographic factors influence the religiosity of Muslim American women? 2) How does religiosity influence subjective modesty? and 3) How does modesty influence the health education, health awareness and attitudes, healthcare provider preferences, and health behaviors of Muslim women in the US?

## **Background and Significance**

### *Religious Commitment and Factors affecting it*

According to the Pew Research Center's study *Muslim Americans* (2007), 23% of Muslim Americans have a high level of religious commitment, which was defined as attending mosque at least once a week, praying all five prayers every day, and reporting that religion is "very important" in their lives. Regular mosque attendance is higher among younger Muslim Americans who were surveyed, with 51% of those under age 30 saying they attend at least weekly, while 36% of those aged 30-54 and 26% of those 55 or older attending weekly. However, more men than women reported attending mosques and Islamic centers weekly (48% vs. 30%). With regard to daily prayer, however, it is observed more frequently by the older Muslim American sample, with 64% of those 55 and older saying they pray every day, compared to 54% of those under age 30.

With regard to assimilation, 20% of those who were native-born Muslims were ranked as having a low level of religious commitment, while 29% of those who were foreign-born were ranked as having a low religious commitment. Furthermore, religious attendance varied among

those who were U.S. born and those who were foreign-born: 45% of those who were native born reported attending attended weekly or more often, compared to 37% of those who were foreign-born.

I was unable to find literature on the possible associations between religiosity and education of Muslim Americans; however, in a review of higher education and religiosity, Albrecht and Heaton (1984) found that among Christians in the U.S., increased level of education is negatively correlated with religious commitment. Nonetheless, they found that within Christian religious denominations, there was a positive relationship between church attendance and level of education, and with regard to Mormons for example, this trend held true in for other metrics of religiosity.

Furthermore, I was unable to find literature directly considering Muslim American religiosity and family influence. However, in a study conducted by Hoge and Keeter (1976) of 307 mostly-Christian raised teachers in two universities, who were aware of both modern intellectual viewpoints along with traditional religious ones, the greatest predictor of religiosity was parental church attendance and culture of religion in the home during childhood. Several other studies have demonstrated similar results with regard to a strong parental influence on adolescent religiosity among Christian and Jewish adolescents (Potvin & Sloane, 1985; Benson, Yaeger, Wood, Guerra, and Manno, 1986; Parker & Gaier, 1980).

This literature helps to contextualize the first part of the conceptual framework of this paper as depicted in Figure 1, but as mentioned above, there is a lack of research on religiosity that is specific to Muslims and particularly Muslim American women. My study aims to fill the gaps available in current literature to help explain individual and family factors (i.e. assimilation, age, socioeconomic status, family religiosity) that may be indirectly influencing Muslim

women's modesty and health behaviors through religiosity.

### *Modesty*

Most of the literature on modesty refers to modesty in the sense of humility and little of what is published refers to religious female modesty in terms of the relationship between males and females. In an anthropological study of Arab Muslim villages, Antoun (1968) indicated that modesty is fundamental to the Middle Eastern way of life and that it is part of both religious tradition (encouraged through Islamic law and Quranic virtues), as well as cultural tradition (informal code of modesty). Antoun works to explain how these two forms of modesty affect the social organization of Muslim villages, focusing on how modesty influences the more conservative dress, the more reserved speech, the seclusion, and the relationships with family members of women in these villages.

In my study I aim to create an index of modesty based on several questions regarding the dress of Muslim American women, their ideals on modesty and Muslim women, self-evaluation of their level of modesty, and their interaction with the male gender. This will help me quantify modesty and test how other variables may be related to it, with specific focus on if it is negatively associated with recommended health behaviors in Muslim American women.

### *Religion and Health by way of Modesty*

One of the key predictors of modesty is religiosity, which intersects with other individual and family conditions to influence health beliefs and practices. Although there has been substantial literature published on religion and health, most of this literature has focused on religious spirituality, not religious modesty, and is not specific to Muslim women. Furthermore, of the literature that has focused on religion and Muslim women's health, most studies have been primarily concerned with contraceptive use as the outcome of interest (e.g. Fikree et al. 2001).

The central focus of this study is to go beyond the scope of the current literature and work to directly explain how religiosity and modesty are correlated and most importantly, how modesty affects health behaviors among Muslim women living in the United States.

### *Reproductive and Sexual Health Education of Muslim Women*

While there has been some literature published about issues regarding the reproductive health of Muslim women, most of these studies sample women outside of the United States. In an interview of 51 informants from nongovernmental organizations and other international organizations in Arab countries and Iran, DeJong et al. (2005) used information from both published and unpublished literature to illustrate that despite significant efforts to improve reproductive health awareness in the Muslim world in the 1990s, national programs to provide education about reproductive health are still needed. The authors argue that although strong Muslim family units may be protective against adverse health outcomes, young people are under-informed regarding reproductive health, and their well-being may suffer as a result. According to DeJong et al., this lack of education stems from the unpreparedness of teachers to address the issue of reproductive health, and may also result from the stigma in modern Muslim society surrounding public discussions of sex and reproductive health. It may be that similar results would be seen in an Islamic school with Muslim teachers, but there is no research to indicate this. One objective of my study is to provide quantitative data on the availability and usage of sexual health education opportunities by Muslim American women and specifically, how families of young women influence their daughter's usage of these opportunities in the United States.

In a study of 405 primarily African American adolescents and 382 mothers the findings indicated that adolescents who spoke to their parents about sex were much less likely to have



initiated sexual intercourse and were more likely to have conservative sexual values (Diiorio et al. 1999). My study would aim to shed light on how Muslim American women obtain information regarding sexual health, if they have discussions on sexuality and sexual health with their families, and if this has similar influences on their level of conservatism/religious modesty while seeking healthcare.

### *Sexual Health Attitudes of Muslim Women and Healthcare Provider Preferences*

In a study by Kadour et al. (2005) which sampled 201 women in three communities near Beirut, Lebanon, the authors found that many respondents believed that having good reproductive health meant being healthy enough to give birth and to fulfill household and marital duties. The authors noted that because social status in Muslim majority contexts may be more dependent on how well women are able to reproduce and raise children, women may believe that reproductive health is crucial in their social status, marital relationship, and “strength to cope with their lives” (Kadour et al. 2005). This helps to contextualize the kinds of beliefs (not including modesty) that affect the health behaviors of Muslim women.

According to Al-Kawthari (2005), the consensus of Muslim scholars of jurisprudence has ruled that one should see a physician of the same religion and sex. If this is not possible, they have ruled that there is no harm in seeing a physician of the opposite sex, provided that only the necessary amount of skin is exposed during examination and treatment. This helps contextualize the results of a survey conducted by Montazeri et al. (2003) among 410 Muslim women in Tehran, Iran, which found that 90% of respondents did not believe that breast self-examination was against their religious beliefs. With regard to clinical breast examinations, the authors found that 58% reported that they would have preferred examination by a female physician, but 47% reported that a clinical breast examination by a male physician was not against their Islamic

beliefs. Therefore, there is nothing inherent in Islamic beliefs that inhibit preventive health behaviors like regular exams from a healthcare provider. However, only six percent of respondents reported performing breast self-examination on a regular/monthly basis (Montazeri et al. 2003).

In a similar study by Underwood et al. (1999) that included three focus groups of Muslim women in the United States, participants reported that they felt more comfortable not only with female physicians, but also feel more comfortable with Muslim physicians. They indicated that although it would not be wrong to reveal themselves to male physicians, they would not feel comfortable doing so regularly. This sentiment was stronger among unmarried women. My study aims to use the themes discussed in these focus groups to provide quantitative data.

Furthermore, participants indicated that many Muslims believe that sickness is a result of God's will, and for this reason, little emphasis is put on prevention in their communities. Petro-Nustas (2001) sampled 59 young Jordanian women and also found that Islamic beliefs in "God's Will" avert many from getting involved in preventive health care, including cancer screening. This may indicate that there are other factors besides modesty that are affecting Muslim women's health behaviors. However, Petro-Nustas indicated that a total of 23% of respondents in the study agreed with the statement that "having a mammogram of the breast would be embarrassing." At the same time, the majority of sampled women did agree that having a mammogram would be beneficial for them.

Furthermore, in a paper by Lurie et al. (2007) the authors found that women were more likely to receive breast and cervical cancer screening if they saw a female physician, with patient preference for a female physician accounting for a significant percent of screening rate differences between female and male physicians for pap smears and mammography.

Overall, my study works to provide quantitative statistics on the healthcare provider preferences of a large group of Muslim American women, focusing on preferences for the religion and gender of the provider. Furthermore, my study aims to pinpoint what is affecting these preferences, how strong these preferences are, and if they prevent Muslim American women from seeking care. Finally, this research works to understand Muslim American women's awareness and attitudes towards health with specific regard to sexual health and how this influences their healthcare decisions.

### *Sexual Health Behavior of Muslim Women*

In a study of 300 Korean American women by Kim and Menon (2009), the authors indicated that women who felt modest about having a healthcare provider touch their breast for an exam were significantly less likely to obtain a mammography, but that after attending an education session about breast-cancer, the mean scores for perceived modesty (8 item index) as a factor that would prevent these women from getting a screening was significantly decreased ( $p < 0.01$ ).

Similarly, in a needs assessment paper by Rashidi and Rajaram (2000), the authors interviewed 39 Middle Eastern and South Asian Muslim female mosque-goers about discomfort with and awareness of breast self-examinations. The authors indicated that there is sensitivity regarding breast health in the Muslim community, but that there are no statistics regarding the prevalence of breast cancer among Middle-Eastern women, who make up a significant proportion of the Muslim community. These findings suggest that more research is needed on breast cancer among Muslim women, including sensitivities associated with breast health. Participants in Rashidi and Rajaram's study were asked about several different health-related topics, including questions assessing their knowledge and understanding of breast cancer and

breast self-examinations. The authors found that although 83% of the respondents reported having heard of a breast self-exam, 74% reported that they had never performed one. The author does not provide much insight as to why this may be, but this thesis proposes that social stigmas surrounding these issues in the Muslim community may make women feel embarrassed to discuss breast and reproductive health.

The main focus of my study is to use a large number of women to quantitatively relate a wide variety of sexual health behaviors among Muslim American women to modesty. Specifically, my study will address how modesty influences whether or not and how often Muslim American women have pelvic exams, pap smears, mammograms, and breast exams and if women feel uncomfortable having these exams. Furthermore, my study also aims to understand whether or not Muslim American women exercise regularly and know how to swim and if modesty affects how often these women exercise and what environment they choose to do so in.

### *Empirical Questions and Hypotheses*

Here I predict that because modesty is a religious value in Islam (Syed et. al 2005), religiosity and modesty will have a strong positive relationship. I hypothesize that those who consider themselves to be more modest women may have less sexual health education and, therefore, a lower awareness of what are sexually healthy behaviors, and ultimately this lack of awareness and education will lead to a lack of healthy sexual behaviors. I believe that this may be the case if those who are more modest come from families where modest behavior was encouraged because these families may not have allowed their children to take courses on sexual health or openly discuss issues of sexual health.

Furthermore, based on the literature on Islamic jurisprudence (El-Kawthari 2005) I predict that more modest women are more likely to prefer Muslim healthcare providers and/or female healthcare providers. I believe that these preferences may have a negative effect on the health behavior of these women if having a provider that they are not comfortable with results in a lack of comfort and openness with their provider. Furthermore, I predict that if the family prefers a Muslim and/or female healthcare provider for their daughter, this will positively influence whether the daughter prefers a Muslim and/or female healthcare provider.

Also, I predict that more modest Muslim women may have poor exercise practices because they may not be accustomed to being in mixed gender settings at local gyms, or may feel that they are compromising their modesty by exercising in these centers or outside in public, and that this lack of convenience will prevent them from exercising regularly.

However, Muslim American women are one of the most highly educated groups of women in the United States (Gallup Poll 2009) and this may also be protective against negative health behaviors and may improve health education and regular exercise, independent of modesty.

### *Sociological Significance*

The study I propose aims to identify, describe, and characterize how attitudes can influence behavior through analyzing potential associations between religious modesty and health behaviors among Muslim-American women. To my knowledge, this is the first study to address this question. Studying Muslim American women may offer a new perspective on the topic of religion and health in the US by introducing possible determinants of health behavior. Focusing on one religious group may allow for the isolation of mechanisms by which religiosity affects health behavior and provide the framework for hypothesis-driven studies on not only the

health behaviors of Muslim Americans, but of other religious groups as well. If questions similar to those in this study are asked in studies of other religious groups, this may further help to isolate the effects of religiosity more generally on health behaviors.

Because there is only a small literature regarding modesty and women's health, this work may inspire further research about Muslim American women's health, as well as new research about the health of women from different religious groups which consider modesty an important part of their faith. Also, more generally, it may motivate research about how conceptions of modesty may affect the health awareness and behaviors of women in other demographic groups in the United States. It may be that there are several other groups of women for which modesty affects their healthcare behaviors and it is important that similar studies are carried out on various other groups.

## **Methods**

To assess the determinants of health access among Muslim-American women, I developed a 96-question survey to ascertain the health and modesty of Muslim American women and made it available to Muslim women living in the Midwest.

The survey instrument was comprised of the following seven sections: demographic characteristics, healthcare provider preferences/breast health status and education, reproductive health status and education, prior awareness of women's health issues (from school and family), exercise, religious observance, and modesty. Two other sections—one on sexual behavior and one on general health—were included, but because these issues may be sensitive, the Institutional Review Board (IRB) at the university where this study was initiated required that I inform my respondents about these sections in the consent form. Ultimately, I decided to exclude

them from the survey instrument as I determined that these variables were not necessary to meet my study aims.

The “demographic characteristics” section included questions that assessed the background of Muslim women living in the United States. Data contained in the section was used to control for potential confounding of the relationship between modesty and health behaviors in the multivariate analysis. Questions regarding health care provider preferences, breast health, and reproductive health were included to assess if values of modesty were associated with awareness of women’s health issues, provider preferences, provider disclosure practices, and health status. Questions about prior education regarding women’s health issues were included to assess differences among Muslim Americans by their value for having modesty in education and discussion about women’s health issues. Questions about exercise were included to assess if levels of modesty were associated with Muslim women’s physical health. Finally, sections about religious observance and modesty were included because these are the variables of interest in my analysis. Details of each variable used in the analysis are outlined in the measures section.

An online version of the survey was administered through the web platform Qualtrics.com, using skip patterns to include only those questions that were relevant to each respondent. For this reason, and because there was missing data, the sample size for each question varied. Those respondents that did not complete the survey questions relating to modesty (which were at the end of the survey) were considered missing values and these respondents were not included in the analysis. Furthermore, the question asking for the age of the respondents, which was the first question, may not have been noticed by several participants. Other respondents indicated through personal communication that they did not know how to use

the tool that was given to indicate age, while others indicated that the system would not allow them to enter a response. Unfortunately, when the format of the question was adjusted, all previous responses were unintentionally deleted in Qualtrics. Therefore, student status was used as a proxy measure for relative age of respondents, with the assumption that those who were students were younger on average than those who were not.

The format of each question varied, with the majority being multiple-choice questions, but a few free-response, ranking questions, and a few “check all of the above” questions were included. A \$3 incentive to “Coldstone Creamery” was offered to the first 200 respondents who completed the survey. Because respondents took an online survey, the incentive had to be mailed to them; therefore, when the respondents completed the survey they were redirected to a second link to collect their address. This method was used to separate the women’s responses from their names and addresses and preserve the anonymity of their survey responses.

The online version of the survey was distributed to younger women through the women’s email listserv of the Muslim Students’ Association at a large Midwestern university, which has approximately 265 female members. The majority of women on this listserv are either currently attending the university or had attended sometime in the past. A minority of the women on the list included community members from the city where the university campus was located or nearby cities, and some students from other universities. Furthermore, to sample from communities whose members may not primarily identify as Muslim, Muslim women on the Pakistani Students’ Association, Arab Students’ Association, and Palestinian Students’ Association mailing list at the university were asked to take the survey. The survey was also sent to mailing lists of Muslim Students’ Associations for other universities in the state where the research was conducted.



To obtain a more age-diverse sample, I aimed to include women from local mosques in the pool of respondents. Originally, it was intended that hard copy surveys would be distributed after Friday prayer services since many women attend the mosque at this time. However, these women usually come to the mosque with their families, so they may not be willing to complete a 10-20 minute survey. For this reason, an IRB amendment was submitted in order to gain permission to send the online version of the survey to mosque mailing lists. Although many women in these communities might not be internet-savvy, this still helped to increase the sample size, although it may have introduced sample bias. The survey was also sent to a mailing list of Muslim health professionals. When members on these mailing lists received the link to the survey, many of them forwarded the email to other individuals and mailing lists that they were on. In this way, unintentional snowball sampling occurred, and women outside of the state were sampled.

The original intended sample size was 100; however, the first recruitment email that was sent out yielded approximately 30 responses to the online survey. Because obtaining a larger sample size was easier than first expected, and because a larger sample size yields higher statistical power, an IRB amendment was granted to increase the sample size. Because of other delays in IRB approval, data collection began in mid-December and continued until mid-February. In the end, 319 respondents started the survey, while 252 respondents completed the survey.

## ***Data***

The independent variables of interest in this study were religiosity and modesty. Questions about religiosity were specific to Muslims. Some questions were similar to those asked in the Pew Research Center study *Muslims in America* (2007), while others were similar to questions asked in religion surveys given to Christians in the U.S. Similar to the Pew Research Center study, questions were asked about ever praying, praying five times a day, and praying on time. Another question was asked regarding how many hours a week a respondent spent in worship outside of physical prayer including making supplication, attending religious get-togethers and lectures, and participating in exclusively Muslim organizations such as the Muslim Students' Association. Finally, questions about religiosity that were not specific to the religious practices of Muslims were asked, including a question about how important religion was in the respondent's life. Respondents were also asked to rank their primary social identities (out of the following: religion, ethnicity, nationality, gender, sexual orientation, and socioeconomic status).

Questions about modesty related to covering of the body and interactions with men. These questions were constructed around demonstrations of modesty particular to Muslims. These questions included whether respondents felt that they covered part of their body in front of men because of religious reasons, whether they believed that an ideal Muslim woman should do so, and how often they wear a headscarf. Student respondents were asked if their parents encourage them to cover their bodies in front of men.

Other questions concerned respondents' comfort with wearing clothes that show the shape of the body in public, wearing low cut shirts, wearing clothes that reveal the arms, and wearing clothes that reveal the legs in public. With regard to interactions with males, respondents were asked if they felt comfortable discussing their social lives with men, "hanging out" with

men, discussing their sexualities with men, and hugging men. Finally, respondents were asked to rank their perceived relative modesty compared to average Americans their age on a scale of 1 to 5 with 5 being the most modest.

In the sections of the survey on healthcare provider preferences, respondents were asked if they had preferences for the religion and gender of their doctors, and if they felt discomfort revealing their body to a male physician during an examination. Respondents were also asked if they felt discomfort during visits to the doctor, and if this discomfort was due to religious reasons. Finally, respondents were asked if they would feel bothered if they received a male physician when a female physician was requested, and if they would still continue their exam. These questions were included because, as mentioned above (Al-Kawthari 2005), the general consensus among scholars of Islamic jurisprudence is that it is preferable for Muslim women to see Muslim female physicians and for men to see Muslim male physicians.

Also included in this section were questions related to breast health. Although questions were asked about ever having a mammogram and mammogram frequency, questions on other breast exams were included as the majority of the sample was young in age and likely would not have had to get a mammogram. Respondents were asked if they knew what a self breast exam was, if they knew how to perform one (and to describe the steps), where they had learned to do so, if they had ever performed one, if a physician had ever performed one for them, and if they had performed them in the last month.

In the next section on sexual health, respondents were asked if they had ever had a pap smear, if they had had one in the last 3 years (since the National Institutes of Health recommend this length between procedures (2009)), if they had ever had a pelvic exam, and if they had had one in the last 3 years. Questions regarding pap smears were kept independent from those

regarding pelvic exams because a pap smear (used to test for Human Papillomavirus) is usually not administered if an individual is positive that they have never had sexual contact with someone who has HPV (or if they are in a sexual relationship in which both partners have never had sexual contact with someone who has HPV). Questions on pelvic exams were included since respondents would be more likely to get a pelvic exam during a routine check up or because of a sexual health problem. Respondents were also asked if they believed a pelvic exam and/or pap smear was important if an individual was not sexually active.

Questions were also asked about exercise habits. Respondents were asked if they exercised regularly, how often they exercised, where they exercised, and if they feel comfortable exercising in a non-gender-segregated area. Furthermore, respondents were also asked if feelings about modesty ever prevented them from exercising or learning how to swim. The question regarding swimming was asked because many Muslim women find it difficult to cover their bodies adequately in water.

Finally, respondents were asked if one-day teach-ins on puberty and other sexual education courses were offered to them in grade school, if their parents allowed them to attend these courses, and if they did, in fact, attend these courses. Furthermore, respondents were also asked if their families had preferences for the gender and religion of the respondent's physician, and if their parents encourage them to cover part of their bodies for religious reasons in order to assess the relationship between this and the respondent's level of religiosity and modesty and subsequently issues related to health.

### ***Analysis***

In analyzing the data, questions regarding religiosity and modesty were recoded so that the responses for each question were ordered from most religious to least religious and most

modest to least modest, with the least religious and least modest responses coded as 1. Respondents were then ranked from most religious to least religious based on responses to five religiosity questions and then divided into quartiles (0-3) with group 3 being the most religious. The following items were used in the scale (see survey instrument in Appendix for full questions): does respondent ever pray ( $\alpha=0.79$ ), does respondent pray all five daily prayers ( $\alpha=0.78$ ), Does respondent pray daily prayers in allotted time ( $\alpha=0.82$ ), hours spent in worship outside of prayer ( $\alpha=0.89$ ), how important is religion in respondent's life ( $\alpha=0.83$ ). A question about how often respondents attended the mosque (or participated in group prayer services on campus if they were a student or in a chapel if their location of employment had one) was ultimately left out of the analysis since, based on the literature, it is much less common for religious women to attend the mosque than religious men, and excluding this question increased the association between religiosity items included in the scale.

Respondents were also placed into modesty quartiles based on their responses to 12 modesty questions, with group 3 again being the most modest. The following items were used in the scale (see survey instrument in Appendix for full questions): does respondent cover body in front of men for religious reasons ( $\alpha=0.88$ ), does respondent believe ideal Muslim woman should cover ( $\alpha=0.88$ ), does respondent wear headscarf ( $\alpha=0.88$ ), respondent's self-ranking of modesty compared to other Americans ( $\alpha=0.89$ ), does respondent wear tight-fitting clothes ( $\alpha=0.87$ ), does respondent show her arms to men ( $\alpha=0.87$ ), does respondent show her legs to men ( $\alpha=0.87$ ), does respondent wear low-cut shirts ( $\alpha=0.89$ ), does respondent hug males ( $\alpha=0.87$ ). does respondent discuss her social life with men ( $\alpha=0.88$ ), does respondent hang out with men ( $\alpha=0.87$ ), and does respondent discuss sexuality with men ( $\alpha=0.88$ ). The correlation between the quartiles for religiosity and modesty was then analyzed with a chi-square test.

Univariate statistics, bivariate associations and multivariate logistic regression were then used to test associations between these religiosity and modesty quartiles and the metrics of health that were mentioned in the measures section. With the data from the religiosity and modesty questions, bivariate chi-square tests were used to assess the relations between responses to each question and the other study variables, and comparisons of modesty with other predictors and outcomes were sometimes stratified by student status. I did not control for potential confounders in these bivariate assessments. Other demographic factors that were identified as confounders of health behavior were adjusted for in the multivariate model used to explain one unexpected trend described below. The following are potential confounders that were considered: student status, relationship status, income level, education, health insurance status, and factors affecting assimilation (e.g. birthplace, generation, etc). Student status was kept in some bivariate models as well.

## **Results**

### ***Univariate Statistics***

Table 1 shows basic descriptive characteristics for the sample stratified by student status. Fully 40% of respondents were foreign born and 86% indicated that another language besides English was spoken at home. 40% of respondents were born in the United States with both parents being foreign-born, while six percent were born in the US with only 1 foreign born parent. A total of 34% were third generation or higher. Furthermore, 72% of respondents were covered by some form of health insurance. This figure was very close to the national average for women (American Cancer Society 2008). 46% of respondents had completed at least graduate school or were currently enrolled in graduate school (compared to 10.2% of Americans who had

completed a graduate degree [American Community Survey 2008] and about 10% of Muslim Americans overall [Pew Research Center]), 23% had completed a bachelor's degree, 30% were enrolled in college or had completed some college, and two percent had only completed high school/earned a GED. All respondents reported completing high school. 95% of respondents had completed their highest level of education in the United States. Ten percent of respondents' mothers did not complete high school, 15% completed high school/earned a GED, 17% had completed some college (or were currently enrolled in college), 35% had completed a bachelors degree, 21% had completed some graduate school (or were currently enrolled), and two percent had completed trade school. Five percent of respondents' fathers completed less than high school, nine percent completed high school/earned a GED, seven percent had completed some college (or were currently enrolled in college), 31% had completed a bachelors degree, 46% had completed some graduate school (or were currently enrolled), and two percent had completed trade school.

### ***Bivariate Statistics***

Table 1 shows the associations between student status and various demographic factors. Here student status was used as a likely indicator of relative age. As seen in the table, there were no significant associations between student status and birthplace, whether the respondent completed education in the U.S., or parents' education level. However, those who spoke another language at home were more likely to be students ( $p < 0.001$ ). Furthermore, 24% of those who were third+ generation Americans, 43% of those who were second with one parent being born out of the U.S., 59% of those who second generation with both parents being born outside of the U.S., and 54% of those who were first generation Americans were students ( $p < 0.001$ ). At the

same time, those who did not have some form of health insurance were significantly more likely to be students ( $p=0.03$ ).

Table 2 shows the cross-tabulation between religiosity quartiles and modesty quartiles. The greatest number of those in the least religious category also fell in the least modest category (49%), the greatest number of those in the second least religious category also fell in the second least modest category (39%), 22% of those in the second most modest category fell in the second most religious category, and the greatest number of those in the most religious category also fell in the most modest category (43%), with a  $p<0.00$ . Because of the high correlation between the two indices, and because modesty is the main independent variable of interest, modesty was used in all models as the explanatory variable of interest, except for the model shown in Table 3B.

Table 3A shows the relationship between level of modesty and healthcare provider preference. There was a significant ( $p=0.02$ ) positive relationship between modesty and female provider preference. 81% of respondents preferred a female physician, and these respondents were significantly more likely to fall in the highest modesty quartile ( $p=0.02$ ). Only 21% of respondents said that they preferred a Muslim physician, but of those who did, they were significantly more likely to fall in the highest modesty quartile ( $p=0.001$ ). (In a study of 264 women, researchers found that 41.9% preferred a female physician for a pelvic exam and 29.5% preferred a female physician for a gynecological health screening [Johnson et al. 2005]).

Moreover, 67% of respondents indicated that they would be bothered if they received a physician different from the gender that they requested, and these respondents were significantly more likely to fall in the highest modesty quartile ( $p=0.054$ ). Furthermore, 39% of respondents indicated that they would feel bothered by seeing a physician of a gender other than requested indicated and that they would not continue with their examination, while 27% would be bothered



but would continue with the exam and 34% would not be bothered. However, as shown in Table 3B, there was a significant difference across religiosity quartiles, with those who would not continue being significantly more likely to fall in the highest religiosity quartile ( $p=0.011$ )

Similarly, 67% of respondents reported that they would feel very uncomfortable revealing their body to a male physician, and these respondents were significantly more likely to fall in the highest modesty quartile ( $p=0.003$ ). 60% of those surveyed indicated that they felt uncomfortable going to the doctor because of religious reasons, and they were significantly more likely to fall in the highest modesty quartile ( $p=0.001$ ). The majority of those who reported that they were uncomfortable were significantly more likely to fall in the highest modesty quartiles.

Table 4 shows health attitudes and awareness in terms of breast health and sexual health. 93% of surveyed women indicated that they did know what a self breast examination is. Of those who knew how to perform the exam, the majority (44%) reported that they learned how to perform the exam from a physician. 49% of respondents believed that it is important to get a pap smear if one is not sexually active, compared to 60% who believed that it is important to get a pelvic exam even if one is not sexually active. Differences across modesty quartiles were not significant for these health behaviors.

Table 5 shows breast health behaviors in terms of self-performed or physician-performed breast exams and mammograms. 61% of respondents reported that had completed a self-breast exam at one point, and 67% reported that a doctor had performed a breast exam for them. However, only 17% reported that they had completed one in the last month. Furthermore, only 15% reported that they had ever had a mammogram and only 12% had one in the last 3 years. Differences across modesty quartiles were not significant for any of the questions relating to breast health.

Table 6 shows sexual health behaviors with regard to pelvic exams and pap smears. 54% of respondents had had a pap smear at one point in their life, with 49% having had one in the last three years. Here differences across modesty quartiles were not significant. However, 51% of respondents had ever had a pelvic exam (compared to the national average of about 70% having one in the last year [National Ovarian Cancer Coalition 2009]) and the difference across modesty quartiles were significant, with 32% (the majority) of those being in the highest, not the lowest modesty category ( $p=0.022$ ). This trend is further discussed and explained below in the multivariate statistic section. Only 44% of respondents had a pap smear in the past three years (compared to the national average of 79.6% [American Cancer Society 2008]), but respondents in the higher modesty quartiles were more likely to have had a pap smear.

Table 7 shows exercise behaviors, with 47% of respondents exercising regularly (self-reported, average days per week exercising was 3.57 with standard deviation of 1.41), compared to about 30% of the general American public (National Center for Health Statistics 2002). Of those who do exercise regularly, 75% only exercise in private areas (including gender segregated gyms, at home, or at a friend's home). 32% of respondents reported that they were not at all comfortable exercising in co-ed areas, and they were significantly more likely to fall in the highest modesty quartile ( $p<0.000$ ). 30% reported that they were somewhat comfortable (with 36% of them being in the second highest modesty quartile), 38% recorded that they were fairly to very comfortable, and they were significantly more likely to fall in the lowest modesty quartile. 53% of respondents also reported that feelings about modesty prevented them from exercising, and they were significantly more likely to fall in the highest modesty quartile ( $p<0.000$ ). However, only 39% of respondents reported that feelings of modesty prevented them from learning how to swim, and there was no significant difference across level of modesty here.

Table 8 shows statistics for some of the variables regarding health education. 17% of respondents reported that they were not given permission by their parents to attend courses on sexual education or special teach-ins on sex and/or reproductive health at school, and 24% reported that their parents were hesitant in allowing them to attend. 25% reported that these courses and teach-ins were not offered at their school. 40% reported that they “always” or “very often” did attend these courses and/or teach-ins, 20% reported that they attended them “sometimes”, and ten percent said that they “rarely” or “never” attended them (42% were not permitted to attend or did not have these courses at their school). However there was no significant relationship here between sexual health education and modesty and it was difficult to find quantitative information on national trends of sex education attendance for non-Muslim American women in order to contextualize the results here.

### ***Multivariate Statistics***

Only variables that produced unexpected results were analyzed with multivariate models. Table 9 shows the adjusted and unadjusted logistic regression models of modesty and pelvic/pap exams. The models on ever having a pelvic exam were analyzed in a multivariate model because bivariate statistics indicated that those who were more modest were significantly more likely to have ever had a pelvic exam. This went against our original hypothesis that those who were more modest would be less likely to adhere to recommended sexual health behaviors. Even though there was no significant association between modesty and ever having a pap smear, pap smear models were included to serve as a reference since the trend between modesty and ever having a pap smear was opposite to ever having a pelvic exam.

Model 1 for the pelvic exam variable considered the odds ratio of ever having a pelvic exam for each modesty quartile with the lowest quartile serving as the reference (pseudo  $R^2$

value of 3%). The odds ratio of ever having a pelvic exam for the highest modesty quartile was significantly greater than the lower modesty quartile when the lowest modesty quartile served as a reference ( $p=0.02$ ). However, when student status and relationship status was added in Model 2, the significance between modesty and ever having a pelvic exam was explained by these confounders and the pseudo  $R^2$  value of the model increased to 31%. The relationship between modesty and ever having a pap smear was made even less significant after accounting for student status and relationship status (pseudo  $R^2$  value increased from 1% to 48%).

## **Discussion**

In a study of 252 Muslim American women I found that my measure of religiosity was associated with my scale of modesty. Modesty scale score was also associated with metrics of health care provider preference, health attitudes, health education, and health behaviors. However, it was difficult to gain an understanding of what factors were directly affecting religiosity and thereby modesty, as there were no significant associations between student status and religiosity, nativity and religiosity, and socioeconomic status and religiosity.

However, our findings indicated that modesty was significantly associated with the desire to have a female and Muslim physician and was also associated with the feeling of being bothered when being seen by a male physician when a female had been requested. Furthermore, there was a significant association between modesty and feeling uncomfortable revealing one's body to her physician. This finding was in line with our hypothesis that modesty would predict health care provider preferences. This was further confirmed by our observation that most women reported that visits to the doctor bring discomfort for religious reasons.

Another compelling finding was that more women believed that it was important to get a pelvic exam even if one is not sexually active than it is to get a pap smear in the same circumstance, though more women had had pap smears than pelvic exams. This finding may provide some insight into the level of medical awareness among the sample, as it is plausible that respondents were aware that pap smears are usually administered to test for Human Papilloma Virus, which is a sexually transmitted virus (National Cancer Institute 2009), so it is not as crucial to have a pap smear if one is not sexually active or is monogamous. Furthermore, there was no significant relationship between modesty and ever having had a pap smear, but there was a significant relationship between modesty and ever having had a pelvic exam. What is more is that those who were most modest were most likely to have ever had a pelvic exam.

This finding was contrary to our prediction that more modest women would be less likely to have sexual health exams, and using multivariate regression I found that the single greatest predictor for ever having a pelvic exam was relationship status. Based on these results I predicted that because married women are more likely to be sexually active, they may be more likely to have pelvic exams because pelvic exams are recommended to those who are sexually active, especially if one is to obtain a prescription for oral contraceptives (Stewart et al. 2001).

In terms of exercise, our findings indicate that the majority of women who exercise do so only in a private area; however, there was no significant association between modesty and place of exercise. It may be that these women do not have access to public gyms or find it more convenient to exercise at home or at a friend's home. However, level of modesty was associated with whether or not respondents were comfortable exercising in a mixed-gender setting (public area), and respondents reported that feelings of modesty prevented them from exercising. At the same time, however, modesty was not significantly associated with whether or not respondents

exercised regularly so it may be that those who find it more difficult to find a place where they feel comfortable exercising are still exercising regularly despite that. Among the sample, modesty did not seem to hinder respondents from learning how to swim. Perhaps this may be true because many learn to swim at a very young age.

With regard to sexual health education, a large number of the women sampled were not given permission to or their parents were hesitant in giving them permission to attend courses on this subject. Although there was no statistically significant relationship between modesty and attendance of these courses ( $p=0.065$ ), the trend was that more modest women were less likely to have attended these courses.

In terms of health attitudes and breast health behaviors, our findings contradicted our hypothesis that there would be an association between health awareness, breast health behaviors, and modesty. With regard to mammograms, the total number of women who had ever had a mammogram was too small to compare against modesty quartiles, and this is likely because most of the sampled women fell below the recommended age to begin getting mammograms. Furthermore, our findings indicated that there was no association between modesty and breast self-exams. However, the sample that was selected may not be entirely representative of the Muslim American female population. Although Muslim women in the U.S. are highly educated (Pew Research Center 2007), most women surveyed were contacted through a university organization, so it may be that these women are still on average more highly educated than the average Muslim woman in the U.S. When asked to describe how to perform a breast exam many women seemed very knowledgeable on the subject and gave detailed medical instructions. It may be that some of these women had physicians in the family and/or are physicians themselves, given that the survey was sent to a Muslim health professionals email listserv.

### ***Limitations, Strengths, and Future research***

There are several methodological limitations to the present design. One limitation in the research design is the lack of random sampling. Because of time and resource limitations, I were unable to obtain a random sample, so convenience-sampling techniques were employed to obtain approximately 300 respondents. The majority of women were part of a university listserv and took the survey online (and are, therefore, internet-savvy and have access to a computer), which may mean that I likely oversampled younger, more educated women of higher socioeconomic status. Also, the sample may not be diverse regarding the level of Islamic religious commitment or identity of respondents since most respondents were contacted through an exclusively Muslim organization. Also, the survey was quite long and many respondents who took the survey without the incentive did not complete the survey (approximately  $\frac{1}{4}$  of respondents did not finish the survey although approximately 300 started it). Another limitation is that there may be a discrepancy between responses from the respondents who knew the principal investigator personally as may be less likely to be truthful in their responses if they feel that their responses are not private.

A strength of the research design is that this study is one of the first known quantitative studies regarding the health access of Muslim women. Furthermore, it is important to consider the strength of the sample size relative to time and funding restrictions. Finally, because the study design is hypothesis driven, it has the analytic capability to assess mechanisms relating Muslim cultural practices to health behaviors.

Investigators interested in the health of Muslim women in the US should include non-Muslim women in future studies about Muslim women and health behavior so that comparative analyses can be completed. This would help isolate which specific variables are affecting the

health behavior of Muslim American women significantly more than other non-Muslim American women and would help to control for possible confounders in the relationship between modesty and health behavior. Furthermore, it would be useful to include non-English speaking respondents in the study since it is possible that they may make up a significant group of Muslim women in the U.S. It may be that this population has a different level of assimilation than an English speaking population of Muslim American women and this may affect the health behaviors of this group. Finally, future studies should also include in-person surveying, as the present study excluded those who were not computer-literate. Also, it may be of interest in the future to ask if the women who attended Islamic grade schools were offered sexual education courses, what was taught in them, and if the parents of these women were more or less likely to allow their daughters to attend sexual health courses.

### ***Implications***

The findings of this study may be used to model future comparative studies between the health behaviors of Muslim women and other non-Muslim women in the U.S., using the results to educate the Muslim American community about health practices among them, and about what practices can be further adapted to improve the community's health. Moreover, my results may highlight misperceptions and poor practices regarding health among Muslim American women. These results could then be used to inform the healthcare community about possible sensitivities of Muslim Americans and therefore, partially address the need for culturally-sensitive health practices and influence policies regarding this, as well motivate interventions to improve the health of Muslim-American women. Finally, this study could be used as a model for future studies on how modesty affects women's health for other demographic groups.



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**Table 1. Descriptive Statistics**

	<b>Total N</b>	<b>% of Total</b>	<b>Student %</b>	<b>Non-Student %</b>	<b>P</b>
<b>Birthplace</b>					0.48
U.S.	143	60	49	51	
Other	97	40	54	46	
<b>Lang. besides English spoken</b>					<0.001
No	34	14	26	74	
Yes	207	86	55	45	
<b>Generation</b>					<0.001
Third or more	34	14	24	76	
Second, One Foreign-Born Parent	14	6	43	57	
Second, Both Foreign-Born Parents	95	40	59	41	
First	97	40	54	46	
<b>Health Insurance</b>					0.03
No	67	28	63	37	
Yes	174	72	47	53	
<b>Education</b>					<0.001
High school/GED	5	2	100	0	
Some college/enrolled in college	71	30	90	10	
Bachelors	54	23	26	74	
Some grad school/enrolled in grad school	109	46	36	64	
<b>Education completed in U.S.</b>					0.68
No	226	95	52	48	
Yes	11	5	45	55	
<b>Mother's Education</b>					0.157
Less than high school	24	10	33	67	
High school/GED	36	15	39	61	
Some college/enrolled in college	40	17	60	40	
Bachelors	84	35	57	43	
Some grad school/enrolled in grad school	51	21	53	47	
Trade School	5	2	40	60	
<b>Father's Education</b>					0.23
Less than high school	13	5	31	69	
High school/GED	22	9	32	68	
Some college/enrolled in college	16	7	50	50	
Bachelors	73	31	53	47	
Some grad school/enrolled in grad school	109	46	55	45	
Trade School	6	2	67	34	
<b>Modesty Quartile</b>					0.34
0	60	25	55	45	
1	61	25	54	46	
2	61	25	54	46	
3	59	25	41	59	
<b>Religiosity Quartile</b>					0.96
0	55	23	51	49	
1	46	19	54	46	
2	62	26	50	50	
3	77	32	49	51	

**Table 2. Religiosity and Modesty Quartiles**

		<b><u>Religiosity Quartiles</u></b>			
<b><u>Modesty Quartiles</u></b>		<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
	<b>0</b>	49%	28%	21%	7%
	<b>1</b>	31%	39%	26%	13%
	<b>2</b>	16%	20%	22%	37%
	<b>3</b>	4%	13%	31%	43%
	<b>Total %</b>	100%	100%	100%	100%

*Pearson Chi Square p<0.001*

**Table 3A. Healthcare Provider Preferences and Modesty**

<b>Healthcare Provider Preferences</b>							
	Total	% of	<u>Modesty</u>	<u>Modesty</u>	<u>Modesty</u>	<u>Modesty</u>	<i>P</i>
	N	Total	<u>Quartile</u>	<u>Quartile</u>	<u>Quartile</u>	<u>Quartile</u>	
			<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	
			%	%	%	%	
<b>Prefer Female</b>							0.02
No	45	19	36	33	22	9	
Yes	197	81	22	23	26	28	
<b>Prefer Muslim</b>							0.001
No	192	79	29	26	24	20	
Yes	51	21	8	22	27	43	
<b>Bothered by getting gender other than request</b>							0.054
No	81	33	33	27	22	17	
Yes	161	67	20	24	27	29	
<b>Continue exam after feeling bothered</b>							0.238
Bothered and will NOT continue	93	39	19	23	29	29	
Bothered but will continue	66	27	21	26	24	29	
Not Bothered	81	34	33	27	22	17	
<b>Uncomfortable revealing body to male doctor</b>							0.003
Not at all	7	3	29	43	29	0	
Somewhat	28	12	46	25	18	11	
Fairly	44	18	36	27	27	9	
Very	164	67	18	24	26	33	
<b>Why is R uncomfortable during exam</b>							0.001
Not uncomfortable	47	20	40	23	15	21	
Uncomfortable for other reasons	49	20	37	20	29	14	
Uncomfortable for religious reasons	142	60	14	28	28	30	

**Table 3B. Healthcare Provider Preferences and Religiosity**

<b>Healthcare Provider Preferences</b>							
	Total	% of	<u>Religiosity</u>	<u>Religiosity</u>	<u>Religiosity</u>	<u>Religiosity</u>	<i>P</i>
	N	Total	<u>Quartile</u>	<u>Quartile</u>	<u>Quartile</u>	<u>Quartile</u>	
			<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	
			%	%	%	%	
<b>Continue exam after feeling bothered</b>							0.011
Bothered and will NOT continue	96	39	19	17	27	38	
Bothered but will continue	65	27	14	18	35	32	
Not Bothered	83	34	36	22	18	24	

**Table 4. Health Awareness, Attitudes, and Modesty**

**Health Awareness and Attitudes**

	Total N	% of Total	<u>Modesty</u> <u>Quartile</u> <u>0</u> %	<u>Modesty</u> <u>Quartile</u> <u>1</u> %	<u>Modesty</u> <u>Quartile</u> <u>2</u> %	<u>Modesty</u> <u>Quartile</u> <u>3</u> %	<i>P</i>
<b>Aware of what self BE is</b>							0.44
No	17	7	24	41	18	18	
Yes	226	93	25	24	26	26	
<b>Where did R* learn to perform self BE</b>							0.357
Don't know what it is	17	10					
Physician	73	45	14	22	30	34	
TV/Website	18	11	28	17	39	17	
Family	5	3	0	60	20	20	
School	32	20	31	28	22	19	
Other	19	12	26	21	26	26	
<b>Believe pap smear impt if not sexually active</b>							0.42
No	122	51	20	26	27	26	
Yes	117	49	30	23	24	23	
<b>Believe pelvic exam impt if not sexually active</b>							0.577
No	93	40	22	27	24	28	
Yes	142	60	27	23	27	23	

\*R=Respondent

**Table 5. Breast Health Behaviors and Modesty**

	Total N	% of Total	<b>Breast Health Behaviors</b>				<i>P</i>
			<u>Modesty Quartile 0</u>	<u>Modesty Quartile 1</u>	<u>Modesty Quartile 2</u>	<u>Modesty Quartile 3</u>	
			%	%	%	%	
<b>Ever done self BE*</b>							0.23
No	95	39	29	28	22	20	
Yes	148	61	22	23	27	28	
<b>Doctor ever performed BE</b>							0.246
No	79	33	32	27	22	20	
Yes	163	67	21	24	27	28	
<b>Performed self BE in last month</b>							0.104
No	200	83	28	24	24	25	
Yes	42	17	10	31	31	29	
<b>Ever had Mammogram</b>							0.079
No	206	85	27	26	23	24	
Yes	36	15	11	19	36	33	
<b>Mammogram in last 3 years</b>							0.182
No	212	88	26	25	25	23	
Yes	30	12	13	23	23	40	

\*BE=breast exam



**Table 6. Sexual Health Behaviors and Modesty**

		<b><u>Sexual Health Behaviors</u></b>						
		<b>Total</b>	<b>% of</b>	<b><u>Modesty</u></b>	<b><u>Modesty</u></b>	<b><u>Modesty</u></b>	<b><u>Modesty</u></b>	
		<b>N</b>	<b>Total</b>	<b><u>Quartile</u></b>	<b><u>Quartile</u></b>	<b><u>Quartile</u></b>	<b><u>Quartile</u></b>	<b><i>P</i></b>
				<b><u>0</u></b>	<b><u>1</u></b>	<b><u>2</u></b>	<b><u>3</u></b>	
				<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	
<b>Ever had Pap smear</b>								0.218
No	112	46	27	29	24	20		
Yes	130	54	23	22	28	30		
<b>Pap smear in last 3 years</b>								0.307
No	124	51	26	29	24	21		
Yes	118	49	23	21	26	30		
<b>Ever had Pelvic Exam</b>								0.022
No	117	49	28	31	23	18		
Yes	124	51	20	20	27	32		
<b>Pelvic Exam in last 3 years</b>								0.049
No	135	56	28	30	21	21		
Yes	108	44	20	19	30	31		

**Table 7. Exercise and Modesty**

	Total N	% of Total	<u>Exercise</u>				<i>P</i>
			<u>Modesty</u>	<u>Modesty</u>	<u>Modesty</u>	<u>Modesty</u>	
			<u>Quartile</u> <u>0</u> %	<u>Quartile</u> <u>1</u> %	<u>Quartile</u> <u>2</u> %	<u>Quartile</u> <u>3</u> %	
<b>Exercise Regularly</b>							0.492
No	128	53	23	27	23	27	
Yes	114	47	27	22	28	23	
<b>Place of Exercise</b>							0.125
Doesn't Exercise	128	53	23	27	23	27	
Privately only	86	35	33	20	29	19	
Publicly or Publicly and Privately	29	12	10	31	24	34	
<b>Comfortable exercising in co-ed area</b>							<0.001
Very	38	16	58	18	16	8	
Fairly	54	22	41	35	19	6	
Somewhat	72	30	18	29	36	17	
Not at all	77	32	4	18	25	53	
<b>Has modesty prevented R's exercising</b>							<0.001
No	113	47	38	33	19	10	
Yes	128	53	13	18	30	38	
<b>Has modesty prevented R from learning to swim</b>							0.231
No	147	61	24	29	23	23	
Yes	95	39	25	18	28	28	

**Table 8. Sexual Health Education and Modesty**

	Total N	% of Total	<u>Health Education</u>				<i>P</i>
			<u>Modesty</u> <u>Quartile</u>	<u>Modesty</u> <u>Quartile</u>	<u>Modesty</u> <u>Quartile</u>	<u>Modesty</u> <u>Quartile</u>	
			<u>0</u> %	<u>1</u> %	<u>2</u> %	<u>3</u> %	
<b>Were parents hesitant allowing attendance of sex ed courses</b>							0.087
Not Hesitant	81	34	33	26	21	20	
Hesitant	57	24	23	28	28	21	
Not Permitted to attend at all	40	17	20	23	38	20	
Not offered	60	25	18	20	22	40	
<b>Did R attend sex-ed courses</b>							0.065
Always	66	33	39	21	21	18	
Very Often	14	7	29	29	36	7	
Sometimes	39	20	15	36	28	21	
Rarely	13	7	23	31	23	23	
Never	6	3	17	33	0	50	
Not offered/Not permitted to attend	100	42	19	21	28	32	

**Table 9. Adjusted and Unadjusted Logistic Regression Models of Modesty and Pelvic/Pap Exams**

<u>Ever had Pelvic Exam</u>					<u>Ever had Pap smear</u>				
	<u>Model 1</u>		<u>Model 2</u>			<u>Model 1</u>		<u>Model 2</u>	
	<b>OR</b>	<b>95% CI</b>	<b>OR</b>	<b>95% CI</b>		<b>OR</b>	<b>95% CI</b>	<b>OR</b>	<b>95% CI</b>
<b>Modesty Quartiles</b>					<b>Modesty Quartiles</b>				
0	Ref	Ref	Ref	Ref	0	Ref	Ref	Ref	Ref
1	0.92	0.44-1.90	0.79	0.32-1.94	1	0.85	0.42-1.73	0.6	0.21-1.72
2	1.66	0.81-3.43	1.52	0.60-3.79	2	1.22	0.60-2.50	0.9	0.30-2.72
3	2.51	1.20-5.27	1.94	0.76-4.96	3	1.78	0.86-3.67	0.92	0.30-2.80
Not Single	-	-	Ref	Ref	Not Single	-	-	Ref	Ref
Single	-	-	0.08	0.04-0.17	Single	-	-	0.04	0.02-0.08
Student	-	-	Ref	Ref	Student	-	-	Ref	Ref
Non Student	-	-	2.53	1.29-4.95	Non Student	-	-	6.99	3.19-15.3
<b>N</b>	241		238		<b>N</b>	242		239	
<b>Pseudo R<sup>2</sup></b>	3%		31%		<b>Pseudo R<sup>2</sup></b>	1%		48%	