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Changing the Culture of Silence: The Potential of an Online Educational Sexual Health and Female Cancer Prevention Intervention in Pakistan

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CHANGING THE CULTURE OF SILENCE: THE POTENTIAL OF
AN ONLINE EDUCATIONAL SEXUAL HEALTH AND
FEMALE CANCER PREVENTION INTERVENTION IN PAKISTAN

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I dedicated this to my best friend Pipi for her unconditional love.
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This dissertation evaluates the effectiveness of a customized educational health intervention on sexual health and female cancer prevention among young women in Pakistan and evaluates the applicability of the integrated model of behavior prevention (IM) when predicting three health behaviors among this population. The study used randomized experimental design with one treatment group and one control group. The results of the study suggest that exposure to web-based customized heath information has positive effect on behavioral intentions to perform breast self-exams and get vaccinated for human papillomavirus, but not for condom use. It was also found that exposure to the website did not have an impact on the constructs in the IM model that should predict behavioral intentions.
CHAPTER 1

INTRODUCTION

This dissertation reports the results of an experiment conducted among female college students at four universities located in Lahore and Karachi, Pakistan. The purpose of the study was to measure the impact of a computer-based sexual and women's health related educational intervention, and to assess the applicability of the integrated model of behavioral prediction when predicting the intentions to perform three preventive health behaviors among young Pakistani college females. The first chapter of the dissertation gives an overview of the topic, the purpose of the study, and chapter organization.

Sex-related topics, including sexual health, have been and still are a controversial and sensitive issue for public discourse in most countries. Anything related to sex is considered to be a personal matter; therefore, talking about sex and sexual health is a complicated and conflicting task. This is especially the case in deeply religious countries like Pakistan, the second most populous Muslim majority country in the world. With a 95% Muslim population, Pakistan's society has strong legal and social controls that enforce conservative agendas and restrict open discussion of topics related to sex and sexuality in general along with other issues related to women's health.

Sexual health is a complicated public health concern in Pakistan. Although Pakistan is a transforming country where Western lifestyles and values communicated via international media and internet, challenge the Islamic ways of life, norms and behavior patterns (Nurullah, 2008), it is important to note that most fields of life in the society are still staunchly governed by an Islamic way of thought. In a conservative country like Pakistan, this influence of religious extends to matters of personal. Because of the stigma caused by religious taboos about sex, basic sexual education is missing in school curriculums and topics related to sexual health have been out of focus for official health communication interventions and prevention programs in Pakistan. This has caused a vacuum of knowledge and support for young people grappling to understand their sexual health and needs, often resulting in a reinforcement of oppressive yet socially accepted sexual practices and biases. At the same time exposure to Western lifestyle,
social factors like urbanization and increasing age at marriage, indicate a growing opportunity for young people to have pre-marital sexual relationships (Hardee, Pine, & Wasson, 2004), which increases the need for reliable and thorough information about sexual health and certain female cancers.

1.1. Problem Statement

Discussing sex-related issues in Pakistan is controversial due to a number of different interpretations of religious teachings. On one hand, as several sexual health beliefs are based on Quran, a statement "There is no shyness in matters of religion" can be interpreted as an encouragement for discussing sexual health and female cancer issues in the society. On the other hand, Islam also says "Shyness is part of the faith", a statement that could be used against discussing such topics. It seems that the prevalent and "safe" approach is to follow the conservative discourse. Talking about issues related to sex is considered to be a taboo in Pakistan and just asking or knowing about sex may be interpreted as a sign of being sexually active (Mane & McCauley, 2003).

The vacuum of knowledge about sexual health especially affects adolescents and young adults, a population group with unique health concerns and needs. Today about 21% of Pakistan's population or 37 million people are between 15 and 24 years old (United Nations, 2010) which is an age period associated with the onset of sexual activity and often high risk sexual behavior (WHO, 2006). However, most of these young people are ill-informed about the mechanics of their own sexual health as Pakistan's culture of silence has led to a lack of adequate training on sexual health issues, causing low awareness and inadequate knowledge levels, the promotion of misconceptions and myths, limited access to credible information sources and services, and sexual violence. This lack of knowledge can lead to major and long-term health problems caused by complications due to unwanted, too early or often occurring pregnancies, bad hygiene or exposure to reproductive tract infections.

Due to gender imbalances in Pakistan, the situation is especially complicated for young females who, courtesy of cultural norms and social restrictions, are particularly uninformed about sexual health and cancer prevention issues. Combined with an age bias, the young females
have severely limited access to necessary health information sources and services related not just to sexual health but to other important health issues such as cancer prevention.

Although a wide range of research has indicated that educating adolescents and young adults on sexual health is one of the most effective ways to improve sexual health outcomes in the long term (WHO, 2010), sexual health classes in school curriculums are still controversial issue, even in developed countries. Pakistan's public school system does not have sexual health classes in the curriculum. Thereby, for a great majority of unmarried Pakistani young females the only sexual health education they receive is confined to an Islamic prescription of abstinence. However, several studies have shown that message strategies based on an abstinence-only approach have no effect in delaying the initiation of sexual activity, in decreasing the number of sex partners or in reducing the risk for teen pregnancy or STIs, including HIV in developed countries (Trenholm, Devaney, Fortson, Quay, Wheeler, & Clark, 2007; Kohler, Manhart, & Lafferty, 2008; Underhill, Montgomery & Operario, 2007; Sather & Zinn, 2002). The results are similar in developing countries, where little evidence has been found of the effectiveness of abstinence-only education (O'Reilly, Medley, Dennison, & Sweat, 2006).

In Pakistan, there is no systematic approach to sexual health education and sexual health related information seeking is often event-based and occurs too late to be educative (Hennink, Rana, & Iqbal, 2005). Absence of sex education in the school system leaves the burden of sexual health education on the shoulders of rarely visited health practitioners, often poorly informed hakims (herbal medicine practitioners in local sex clinics) or a limited number of nongovernmental institutions (Khan, 2000). In spite of a wide range of literature suggesting that sexual health education does not encourage sexual activity (Grunseit, 1997), several initiatives by nongovernmental organizations to implement sexual health programs in Pakistani schools have been opposed by parents or teachers due to their perception that this information is culturally inappropriate and as something that may encourage their children to become sexually active.

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1 According to Advocates for Youth (2001), abstinence-only (also known as abstinence-only-until-marriage) education does not acknowledge pre-marital sexual relationships and therefore teaches only benefits of abstinence but excludes information on contraception for the prevention of sexually transmitted infections (STIs) and unintended pregnancies. Comprehensive sexuality (also known as abstinence-plus) education includes programs that emphasize the benefits of abstinence but also includes information about birth control methods and prevention of STIs.
Because of aforementioned absence of sexual health education and existence of social barriers that prohibit discussing about sexual health, young adults in Pakistan tend to be poorly informed or often misinformed about sexual health issues, including bodily changes related to puberty, prevention of sexually transmitted infectious and reproductive health.

A large-scale study among ever-married 15-49 year old Pakistani women stated that due to low awareness, 86% of participants recalled having problems when having their first menstruation. The same study showed that even though they had educated their own daughters about menstruation, they often did not cover other related issues as hygiene practices, breast development or psychological problems related to puberty. Furthermore, more than half of these women considered it unimportant to educate adolescent females about body and emotional changes (Khan & Pine, 2003).

A study conducted among 10-19 year old females in Karachi, Pakistan confirmed that there is a lack of knowledge related to puberty and related health problems among female adolescents (Ali, Ali, Waheed, & Memon, 2006). Among the participants of the study, only 66% of females were able to name reproductive organs, 32% did not know the definition of menstruation and 80% reported that menstruation allows females to have children. The beliefs related to sexual health were mostly based on what was taught by their mothers, majority of whom had taught their daughters not to bathe, pray or preach, carry heavy weight and eat certain foods during menstruation (Ali, Ali, Waheed, & Memon, 2006). Furthermore, in some areas in Pakistan, girls are not allowed to go out of the house during menstruation (Hamdani, Lee-Jones, & Sadler, 2006).

A national survey indicated even lower knowledge levels on sexual health issues among young females. Great majority of Pakistani young women are not informed about puberty, causing unnecessary fear and stress and result in a lack of practical skills to take care of their body (Ali, Ali, Waheed, & Memon, 2006; Hamdani, Lee-Jones, & Sadler, 2006). Surprisingly, some studies have indicated that the urban females are less likely to be informed about puberty compared to girls who live in rural areas (Sathar et al., 2003).

Studies in rural and urban areas have indicated low awareness and knowledge on STI causes and prevention. A community-based survey from a rural area in Sindh province indicated that although 62% of 15-19 year old young individuals knew that one can get a disease through sexual contact, only 44% could correctly name at least one STI. Furthermore, only 69% of
respondents had heard of HIV/AIDS, only 55% knew at least two modes of HIV transmission, and 19% believed that there is a cure for AIDS (Raheel, White, Kadir, & Fatmi, 2007). A study from Karachi showed similar results: only 46% of 10-19 year old females could mention any STI names and only one third of respondents had heard about self breast examination (Ali, Ali, Waheed, & Memon, 2006). As stated before, there are several misconceptions related to sexual health amongst the population. For instance, one study among unmarried 13-21 year old Pakistani females suggested that surprisingly large percentages of participants had talked about pregnancy (81%), contraceptives (80%) and sexual intercourse (58%) but at the same time, girls reported many misconceptions about sexual health, including a belief that kissing could cause pregnancy (Qazi, 2003).

Although some studies have indicated that young Pakistani females' knowledge on contraceptives is quite high, reaching to 85%-87% (Ahmad & Eskar, 2008; Qazi, 2003), the majority of unmarried sexually active females do not use any contraceptive method (Pachauri & Santhya, 2002).

Overall, the low level of sexual health awareness and knowledge is not surprising due to lack of information sources that would provide credible and trustworthy information about these topics. Without gaining any information from schools, the main sources for Pakistani young females to get information about sexual health issues are peers, especially female friends and sometimes family members, and media (Sathar et al., 2003; Qazi, 2003; Hennink, Rama & Iqbal, 2005). It seems that there is mutual feeling of embarrassment in terms of discussing sexual health matters between parents and children. Young adults often feel that discussing sexual health matters with their parents is inappropriate (Vahe, 2012) or feel that parents are not a reliable source of sex related information, therefore adolescents prefer to turn to peers and media for information (Khan & Pine, 2003). At the same time there is an overall apathy of parents on taking proactive steps for educating their children on sexual health as they assume that their children learn about these topics themselves, in schools or skill development centers (Minhaj ul Haque & Faizunnisa, 2003). Furthermore, parents also feel embarrassed about discussing sexual health issues with their children and are often uneducated themselves about these topics, lacking knowledge and vocabulary when discussing about sexual health (Bott & Jejeebhoy, 2003; Hamdani, Lee-Jones, & Sadler, 2006).
Hennink, Rama & Iqbal (2005) conducted a study among 192 unmarried or recently married 18-25 year old Pakistanis to examine their experiences in gaining knowledge of personal and sexual development within the cultural context of Pakistan. The results of the study supported the findings of previously discussed research, while adding to the discourse by indicating that the preferred sources of information changes depending on the girl's stage of sexual development. The results indicated that although mothers, older sisters, friends or sister-in-laws are the key sources of information in the first stage of information seeking triggered by menarche, in the second stage, where young girls get interested in sexual development, the information sources changed as the girls experienced feelings of mutual embarrassment between themselves and their parents. Family members as information sources were replaced by magazines, TV and films and Islamic books, and friends became the key source of knowledge (Hennink, Rama & Iqbal, 2005).

Unfortunately the societal taboos have often extended to other crucial health behaviors like female cancer prevention, a result of prevention practices like breast exams being falsely labeled as sexualized or inappropriate. Husbands and both male and female parents often feel that physician based physical exams are inappropriate for their daughters or wives, as they violate the conservative norms by allowing a stranger to view and touch their body. These taboos are often applied to physicians of both gender, making a female doctor's inspection of other women just as offensive as a male doctor (Bottorff et al., 1998; Rashidi & Rajaram, 2000).

Despite these societal taboos, overall, the majority of Pakistani youth are open-minded about acquiring tabooed health information (Ali, Ali, Waheed, & Memon, 2006; Sathar et al., 2003), however, lack of credible and adequate sexual health and female cancer prevention information and sources has lead to a situation where there is a huge gap between the demand for this information and its current supply. Therefore, the Pakistani population has an urgent need for a proactive, credible and accessible new information source about critical health issues mired in societal taboos, namely sexual health and female cancer prevention.

As traditional sexual education and female cancer prevention tools have not worked or cannot be used, a new approach must be applied that gives individuals an opportunity to gain information in their private environments. The internet may be a useful health communication tool in Pakistan where alternative sources of sexual information and female cancer prevention are limited. From 2000 to 2010, Asia has seen a growth of more than 620% in the number of
internet users, leading to a current total of 20.431 million users in Pakistan (IWS, 2011). Due to aforementioned deep religious and cultural values that discourage discussions about topics related to sex and other health topics labeled as sexual, the internet may have potential to become a discrete information source that provides access to multimodal information on sexual health and female cancer prevention. Thus, web-based sexual health awareness and female cancer prevention interventions could show great potential, especially in Islamic countries, allowing users to anonymously and privately learn about health conditions viewed as stigmatizing.

However, beyond the obvious benefits of anonymity, the medium's most valuable contribution is its ability to provide access to reliable information that would normally be hard to get even if the social stigmas were not there, mainly due to the scarcity of modern health facilities and financial restraints of the middle and lower classes in Pakistan.

1.2. Purpose of the Study

Following the principles of the ecological perspective, individual's behavior is part of a larger system and is continuously reciprocally influenced by the environment around him or her. There is no doubt that socio-religious context, health related policies, and availability of healthcare services directly influences young females' sexual and general health in Pakistan. By using the structural model of health behavior change proposed by Cohen, Scribner, & Farley (2000), it can be suggested that four factors that are beyond Pakistani young females' control have great impact on their sexual health and women cancer prevention behaviors. At first, availability of protective consumer products which refers to the accessibility of condoms or birth control in order to practice safe sex, prevent unwanted pregnancies or protect from HPV through vaccination. Secondly, physical structures reduce or increase opportunities for healthy behaviors, such as availability of sexual health clinics, STI testing centers, breast cancer screening facilities and qualified physicians. Thirdly, individual's behavior is influenced by social structures or laws and policies that require or prohibit behaviors. As discussed later in this paper, there are laws in Pakistan that on one hand forbid pre-marital sexual relationships but on the other hand limit the accessibility of STI testing and justify forced sexual relationships. Finally, health related cultural and media messages influence individual's behavior by aiming to change individual's knowledge and beliefs (Cohen, Scribner, & Farley, 2000). Although the authors of this structural model
claim that effective health behavior change interventions should include all these factors, in Pakistan's context it is nearly impossible make this happen, a fact that renders such an attempt impractical and out of the scope of this study. Therefore, this dissertation focuses on the last factor – health messages – and seeks to measure the impact of one web-based information source on young Pakistani urban females' attitudes, self-efficacy, perceived social norms, and intention regarding a number of behaviors related to sexual health and women cancer prevention behaviors.

Overall, this study has two goals. The first goal is to test the predictions of the integrative model of behavioral prediction (IM) as a means for identifying the factors associated with Pakistani college females' intentions to perform three sexual health and cancer prevention behaviors. The second goal of this study is to measure the effectiveness of a customized online health information website targeted to influence young Pakistani females' intention to perform breast self-exams, use regularly a condom during vaginal intercourse, and get vaccinated for human papillomavirus (HPV). Therefore, following a review of the situation analysis, empirical literature and theoretical framework, this study used the constructs of the IM to look at how a web-based sexual health and women's cancer prevention intervention influences the attitudes, norms, self-efficacy, and intention in regards to three behaviors related to sexual and women's cancers. Ultimately, the purpose of this study is to demonstrate how the IM can inform the design of targeted sexual health and cancer prevention intervention aimed at increasing the proportion of young Pakistani college females that engage in preventive health behaviors.

For this research, a web-based customized educational intervention was designed that includes several crucial topics related to sexual and women's health. The study used randomized experiment between groups design with one treatment group and one control group. A convenience sample of college students was recruited in four university campuses. The objectives of the study were tested by using the path analysis.

The results of the study could initiate further research on this topic that would include wider populations and provide more generalizable results. However, this experiment is to be thought of as a platform for research on sexual and women's health in religiously conservative areas and in case of success can be modified to be applied to similar situations to other regions.
CHAPTER 2

LITERATURE REVIEW

This dissertation focuses on women's sexual health and cancer prevention behaviors. Consistent with accepted definitions, within the scope of this research, women's sexual health encompasses not only reproductive health and fertility but also the physical, mental, emotional and socio-cultural well-being related to sexuality throughout an individual's lifespan (WHO, 2010a). Although sexual health is something very personal, it is critically influenced by several factors at the individual, family, community, and state level, which often cannot be controlled by the individual themselves. Besides physical, psychological and cognitive indicators, sexual health is affected by political and economic factors, norms, roles, cultural values, and religious beliefs.

This chapter gives an overview of women's sexual and preventive health topics which are in scope of this dissertation, presents data mostly from developing countries, and provides a situation analysis of reproductive tract infections (RTIs) and contraceptive use in Pakistan. In addition, the chapter includes an analysis of Pakistan's socio-religious environment that influences young females' sexual health information seeking, and gives a review of the integrative model of behavior prediction (Fishbein, 2000), which provides the theoretical framework for this study. The chapter ends with research questions and hypotheses.

2.1. Background

2.1.1. Socio-religious context in Pakistan

The broader socio-cultural context plays a significant role in an individual's sexual beliefs and behaviors. Lorimer (1954) acknowledged almost sixty years ago that one of the prerequisites of successful family planning initiatives is considering the "background conditions" that guide behaviors. Similarly, Freedman (1987) emphasized the importance of cultural influences on issues related to family planning and fertility, defining culture as "the system of beliefs that guide behavior in each society" (p. 58).
In Pakistan, culture is closely interrelated with religion which defines the core values and normative behavior patterns in the society. Islam is not considered to be merely a religion of worship, but also a social system, a culture and a civilization (Omran 1992). Therefore, in a conservative country like Pakistan, religion greatly influences all areas in life, including health matters.

Islam acknowledges the power of sexual need and recognizes the sexual urge and desire for reproduction. Sexual function is considered to be sacred in Islam as it is believed to express the will and the power of god (Halstead & Lewicka, 1998). Overall, Islam encourages sexual relationship within marriage and sees marriage as a shield from immoral behavior like sexual relationships without commitment. Thus, according to Islam, a family is the basic social unit and family formation is an essential responsibility of couples.

As Pakistani society places high priority on preserving young women's virginity before marriage, it is a factor that greatly affects women's education, age at marriage, autonomy and mobility (Bott & Jejeebhoy, 2003). Virginity is perceived as a symbol of the family's honor and it is protected by the parents employing any means necessary. Making sure that their daughters preserve their chastity before marriage, parents often forbid their children to move around unescorted. Often izzat (honor) is protected by practicing purdah (to hide from sight) norms after adolescence and puberty, the practice that calls for physical and social separation of the sexes (Khan, 1999; Khan, 2000; Bott & Jejeebhoy, 2003; Hardee, Pine, & Wasson, 2004). If a girl violates social norms and is found out or even suspected to be having a sexual relationship, she can be beaten or killed according to customary laws, or she can be charged for adultery under the Pakistani law known as the Hudood Ordinance, which may lead to imprisonment or death (Khan, 2000).

When married, lack of autonomy in marital homes often includes young females' limited opportunities to participate in the decisions about their own health and family planning (Bott & Jejeebhoy, 2003). In South Asia, in-laws expect marriages to result in childbirth within a few years of couples living together (Adhikari, 2003; Chowdhury, 2003). In Islamic countries children, especially sons, are associated with economic and social benefits, making male children a source of pride for parents and grandparents alike. In his commentary, Farsoun et al (1996) identified three social barriers that affect fertility control in Jordan and that can also be applied to other Islamic countries such as Pakistan (Al-Oballi Kridli & Libbus, 2001). Firstly, there is a
traditional pressure to have children, stemming from the belief that children are a source of labor for the family and are expected to act as caretakers for parents in their old age. Secondly, there is familial pressure to have more children, especially boys, in order to preserve the family name. Thirdly, there is religious pressure based on the belief that it is a Muslims’ religious duty to multiply and populate the earth as "Muslims should be fruitful and that God will take care of children, regardless of the economic situation of the parents" (p. 145).

Family planning is a large part of sexual health and is greatly influenced by religion. However, the interpretations of Quran regarding whether Islam allows contraceptives is controversial. Due to a wide range of interpretations of religion and local cultural traditions, Muslim countries' position on family planning varies (Seltzer, 2002). Some religious scholars have stated that al-`azl (coitus interruptus or withdrawal method) as prevention of pregnancy is permissible in Islam, and similarly modern alternative methods are allowed as long as the purpose is to prevent pregnancy and does not cause permanent loss of fertility (Omran, 1992). However, for decades, religious concerns have been among the two most common reasons for not using contraceptives (Casterline, Sathar, & Minhaj ul Haque, 2001). Some Muslims interpret birth control as a form of killing and hesitate to use contraceptives because it conflicts with their moral norms and a belief that fertility should be determined by God (Hardee & Leahy, 2008). The perception that contraceptive use is prohibited by religion is probably the reason why higher religiosity has been related to bigger family sizes among Muslims (Siddh, 1974).

Several Muslim countries like Iran, Egypt, Indonesia and Bangladesh have succeeded in gaining Islamic religious leaders’ advocacy for family planning programs. Even in Pakistan, there have been some reproductive health initiatives that have been collaborating with religious leaders (UNFPA, 2008), however, such collaboration is often complicated as only 9% of religious leaders in Pakistan state that Islam approves family planning and 43% perceive that Islam disapproves it (Hakim, Uhssain, Baqai, & Tanweer, 2000). Therefore, approaching this topic from the religious discourse may have an opposite effect. According to Hoodfar & Assadpour's study (2000) many religious leaders even use Friday prayers (jummas) to censure contraceptive use by associating it with an "imperialist plot" with the aim to subjugate Muslims and maintain the dominance of the West over the developing Islamic countries.
2.1.2. Legal System and Policy

Pakistan is an Islamic republic, and while the country does not follow Sharia law, its legal system and some of its laws are heavily influenced by tenets of the Islamic legal code, which also regulates fields related to sexual health. In fact, Islamic law provides clear instructions for Muslims' sexual behavior. According to the Pakistani law called the Hudhood Ordinance, promulgated in 1979, sexual activity in Pakistan is legal only in marriage settings between a husband and wife. Under Islamic laws, a girl becomes a woman with the onset of menstruation and is therefore liable to severe punishment when having sex before marriage (Khan & Pine, 2003).

Sexual health is also a politically sensitive topic in Pakistan. Due to religious opposition as well as politicians' fear of losing votes, only a limited number of nongovernmental organizations or health practitioners seek to inform public about sexual issues (Hardee, Pine, & Wasson, 2004). Pakistan is a signatory of the International Conference on Population and Development (ICPD) which among other topics address sexual health problems among adolescents and young adults.

ICPD Program of Action Chapter Eight states (United Nations, 1995):

Full attention should be given to promoting mutually respectful and equitable gender relations and particularly to meeting the educational and service needs of adolescents to enable them to deal in a positive and responsible way with their sexuality. (p. 41) /---/ Adolescent sexual and reproductive health issues, including unwanted pregnancy, unsafe abortion (as defined by the World Health Organization), and STDs and HIV/AIDS, are addressed through the promotion of responsible and healthy reproductive and sexual behavior, including voluntary abstinence, and the provision of appropriate services and counseling specifically suitable for that age group. (p. 50) /---/ The objectives are: to promote the adequate development of responsible sexuality that permits relations of equity and mutual respect between the genders; /---/ and to ensure that women and men have access to information, education and services needed to achieve good sexual health and exercise their reproductive rights and responsibilities. (p. 48)

Recommended actions include giving support to integral sexual education and services for young people as well as to develop national policies that would take into account the realities
of current sexual behaviors (United Nations, 1995). However, in contrast to some other Muslim countries, Pakistan's national policies have not shifted its focus to young people's sexual health issues, and concepts highlighted in the ICPD are not followed. In 2002, Pakistan approved its National Population Policy that seeks to offer a framework for reducing population growth.

The document (Pakistan Ministry of Population Welfare, 2002) addresses adolescents and young people by stating that:

Youth are the future generation and need to be sensitized about the wide-ranging consequences of rapid population growth for the individual, family and nation and, therefore the need to build a mindset for responsible parenthood. /---/ The two-pronged strategy addresses adolescents through population and family life education in the formal and non-formal education sector and reaches out to young couples with appropriate media, interpersonal messages and services. (p. 4)

High discontinuation in contraceptive use, higher maternal and child mortality rates than in other developing countries (The World Bank, 2011) and high levels of unwanted fertility illustrated by nearly 900,000 induced abortions in a year (Sathar, Singh, & Fikree, 2007) are indicators of the policy's failure to reach its goals. Furthermore, sexual health education focusing on STIs, including HIV prevention, is not covered in this document.

In 2010 Pakistan government approved a new National Population Policy which again prioritizes family planning (Pakistan Ministry of Population Welfare, 2010). Although the Secretary of Pakistan's Ministry of Population Welfare stated in his statement at the 43rd Session of the Commission on Population and Development (Durrani, 2010) that the goals in the policy are set out by following three major areas of the ICPD, this document, however, does not mention sexual education of adolescents or unmarried young adults in its plan of action.

From December 1st 2010 Pakistan Ministry of Population Welfare was liquidated as with the 18th Amendment to the Constitution all health-related programs in Pakistan became the responsibility of provincial governments. This move inhibits synchronized efforts, sector wide approaches, and inter-sectoral collaboration – factors whose low incidence has already limited Pakistan's progress in reproductive and sexual health development (Abrejo, Shaikj, & Saleem, 2008). On the other hand, this reform could potentially decrease the red tape and give more opportunities for collaboration between nongovernmental organizations and local governments for developing new sexual health education programs.
2.1.3. Social and Health Status of Young Females

Strict socio-cultural norms and local policies have direct influence on young females' mobility and decision-making related to sex, as well as their sexual health status. Religious and socio-cultural norms limit Pakistani young females' access to health services and the mobility of unmarried young adults is often limited as their life passes under the watchful eye of their parents. The results of a national survey in Pakistan reported that 96% of young females needed express permission to visit their nearby health centers, while 87%, even when permitted, were not allowed to go to the health centers alone (Sathar et al., 2003). In addition, parents are often reluctant to take their children to a clinic even when there is an urgent need because they are afraid that this could be perceived as an indication that their child is sexually mature which could be a threat to family honor (Khan, 1999).

The limitation on young females' mobility does not change much after they get married. In Islamic patriarchal societies men have significant power over the health-seeking behavior of family members. For example, a systematic review indicated that in Punjab, only 28% of married females were allowed to visit a health center without escort (Jejeebhoy & Sathar, 2001). Another study showed that one of the main reasons why women have refused to participate in studies that involve vaginal examinations has been lack of their husband's permission (Raza et al., 2010).

However, even in families where women have more mobility, those who have a need to visit a doctor often try to solve their problems themselves or with the help of their friends or family members (Mouli, 2003). A national survey conducted among more than 8,000 young individuals in Pakistan indicated that more than three-fourths of 15 to 24 olds do not consult a doctor either for sensitive or general health issues (Faizunnisa & Ikram, 2004). Furthermore, even when seeking health care, young urban Pakistanis with sexual health problems prefer to seek it in a local "sex clinic" where service is provided by herbal medicine practitioners (hakeems) who often work illegally and do not have medical education (Ranuja & Hussain, 2003). For many young individuals these are often the first places to seek care as they are perceived to be less judgmental compared to public health clinics. However, the quality of care received from these facilities is often unacceptable. Ranjha & Hussain (2003) conducted an experiment among hakeems in Rawalpindi, Pakistan and found that the healers had poor and myth-ridden knowledge about sexual health; they lacked vocabulary to address sexual health issues, and had limited and often wrong information about STI diagnosis and treatments. In
addition, the prescribed medicines often contained dangerous substances as appetite stimulants, steroids, male and female hormones, and narcotics. There were also incidents where patients reported sexual harassment by *hakeems* (Ranjha & Hussain, 2003).

There are many practical barriers as well as stigma and social constraints that limit young Pakistani females' access to health services or practice safe sex. Barnett & Schueller (2000) state that obstacles for young people to seek health care include high cost of services, inconvenient locations or working hours, and inability to visit a doctor without family member's permission or presence. For instance, current laws in Pakistan prohibit HIV testing for under 18-year-olds without parental or state consent (Khan & Khan, 2010). In addition, living conditions of young females may have effect on their sexual behaviors. For instance, as in Pakistan most unmarried young adolescents live with parents, the fear that they can be caught possessing contraceptives can serve as a barrier for their use (Hardee, Pine, & Wasson, 2004).

Additionally, for many young individuals visiting health clinics is not acceptable due to confidentiality issues with a health care provider, threatening and judgmental clinic staff members, fear of medical procedures, feeling of shame and embarrassment (Senderowitz, 1999), and most importantly, fear of discovery by community or family members (Captor & Patel, 2006; Barnett & Schueller, 2000). These can be serious barriers for a young person to seek health care, especially if it is related to sensitive topics such as sexual health or female cancer prevention. For instance, 56% of young unmarried females in Karachi stated that STIs or problems related to sexual organs should not be reported to anyone (Ali, Ali, Waheed, & Memon, 2006).

Finally, under-qualification of health care providers can also be a barrier for health care seeking. Recruitment and training of well qualified health care providers is often problematic in developing countries (Boyle & Levin, 2008). For example, the results of a study conducted in Pakistani tertiary care centers indicated that majority of working health professionals did not have adequate knowledge about the primary and secondary prevention methods of cervical cancer (Ali et al, 2010), the second most common cancer diagnosed in Pakistani women (WHO, 2010b). Furthermore, a study assessing health care provider's knowledge on STIs showed devastating results. Only 45% of respondents had correct knowledge about prevention and transmission of HIV and 10% could cite the correct treatment for syphilis and vaginal discharge (Khan, Unemo, Zaman, & Lundborg, 2009).
2.1.4. Social Factors and Behaviors Influencing Pakistani Women's Health

In most developing countries, young people are marrying later than their counterparts in previous generations (Mensch, Singh, & Casterline 2005). Pakistan follows the same trend as over the last five decades, the percent of 20-24 year old married men and women has decreased steadily (Minhaj ul Haque & Faizunnisa, 2003). In 2007, the average age of Pakistani females at first marriage was 22.8 years (Pakistan Federal Bureau of Statistics, 2010) which reflects an increase of six points compared to 1960s. However, due to the lack of acknowledgement of premarital sex by the youth, there is no data available on the average age of sexual debut for females in Pakistan. Local studies in this area mostly assume that females will first engage in sexual relations upon consummation of marriage and therefore do not ask sexual behavior questions from unmarried females.

The reality is almost certainly very different as is evident from the fact that people are increasingly getting married at older ages in the present times, and it is therefore suggested that premarital sexual activity is increasing possibly both as a cause and as an effect of the late marriages. Unfortunately, due to aforementioned issues there is almost no data on Pakistani youth's sexual behavior before marriage. One study conducted among 13-19 year olds indicated that during face-to-face interviews only 1% of girls said that they had sex; during the anonymous self-administered interview, the percentage rose from 1% to 3% (UNICEF, 2006). Studies from India (e.g. Jejeebhoy, 1998; Abraham, 2003) have shown that up to 10% of young females have premarital sexual experience. However, a recent study from Lahore, Pakistan that was conducted among 18-24 year old female college students showed much higher percentages: 45.6% of never married college females reported having engaged in vaginal intercourse by the time of the survey, 78.3% of them had had the first sexual intercourse before their 18th birthday, and on average, the study participants had had 2.69 sexual partners (Vahe, 2012).

According to various studies, the percentage of Indian or Pakistani young males who have had a sexual relationship before getting married is between 5% and 30% (e.g. Jejeebhoy, 1998; Abraham, 2003; UNICEF, 2006). Young males' sexual partners often include older women (aunties), and male, female or transsexual (hijras) commercial sex workers, while sexual intercourse with these partners mostly takes place without a condom (Abraham, 2003). As discussed later in this dissertation, several studies have reported extremely high prevalence of
reproductive tract infections among commercial sex workers in Pakistan, increasing remarkably the risk of contracting a STI among young males' future partners.

2.2. Conditions Related to Risky Sexual Behaviors

2.2.1. Reproductive Tract Infections

While affecting millions of individuals all around the world, reproductive tract infections (RTIs) have been a neglected health issue for years. With the emergence of HIV during the last decade, local governments and international donor organizations have finally acknowledged that both in developed and developing world RTIs have become a major public health issue with serious and expensive consequences.

Firstly, RTIs include sexually transmitted infections (STIs) that can be contracted through body fluids by being in contact with semen, blood, vaginal secretion, breast milk, and saliva. Overall, there are two types of STIs: curable infections that are caused by bacteria (syphilis, gonorrhea, and chlamydia) or parasites (trichomoniasis) and can be cured with antibiotics; and incurable STIs that are caused by viruses (HIV/AIDS, genital herpes, human papillomavirus (HPV), and hepatitis B) (NIH, 2007).

Secondly, women in especially developing areas are affected by other reproductive tract infections (RTI) such as bacterial vaginosis and vulvovaginal candidiasis which are endogenous infections caused by overgrowth of organisms that can be found in the genital tract of healthy women (Wasserheit & Holmes, 1992).

A third type of RTIs includes iatrogenic infections which can be contracted during medical procedures and are therefore out of focus of this dissertation.

2.2.1.1. Sexually transmitted infections. Curable and incurable STIs are considered to be a "hidden epidemics" as people tend not to openly talk about them and these infections often do not have any visible symptoms. Due to stigmas and lack of symptoms, STIs are often underreported, but they are considered to be a major global public health problem.

According to the estimations, annually 448 million new cases of four main curable STIs occurred in 2005 worldwide (WHO, 2011). A large majority of them occurred in developing countries where STIs and their complications are among top five disease categories for which
adults seek medical aid (WHO, 2001). In addition, there are approximately 33.4 million people who live with the HIV virus today and most of them reside in low-income countries in Sub-Saharan Africa and South and South-East Asia (UNAIDS, 2010).

The most often occurring STIs in South Asian countries include bacterial infections such as gonorrhea, chlamydia, syphilis, chancroid and trichomoniasis; and viral infections such as human papillomavirus (HPV), hepatitis B virus (HBV), genital herpes, and HIV (Patel, Burnett, & Curtis, 2003).

*Chlamydia* is the most common bacterial STI. According to WHO (2001) estimations, there are 92 million new chlamydia cases annually, and almost half of them occur in South and South East Asia. In women, chlamydia can cause abnormal vaginal discharge, burning sensation, lower abdominal or back pain or bleeding. Untreated chlamydia can cause infertility, in pregnant women, chlamydia may cause premature delivery and stillbirth, and lead to eye and respiratory tract infections in newborns (CDC, 2012a; Dixon-Mueller & Wasserheit, 1991). Chlamydia is hard to control as majority of chlamydia cases are asymptomatic and diagnostics of the infection require sophisticated and expensive equipment (Dixon-Mueller & Wasserheit, 1991; WHO, 2001). Chlamydia is treatable with antibiotics.

*Gonorrhea* is a common STI with 62 million annual new cases worldwide, including 27 million in South and Southeast Asia (WHO, 2001). Gonorrhea is curable but hard to diagnose especially in women as approximately 80% of cases are asymptomatic. If symptoms occur, infected females may feel pain and burning sensation when urinating, abnormal vaginal discharge, bleeding (CDC, 2012b), rash, and painful joints (Dixon-Mueller & Wasserheit, 1991). If untreated, gonorrhea may have severe complications. The infection is considered to be the most common cause of pelvic inflammatory disease (PID) which may lead to infertility, fatal ectopic pregnancy, and chronic pain (Dixon-Mueller & Wasserheit, 1991). When spreading gonorrhea from mother to baby during delivery, the infection may cause blindness, joint infection or fatal blood infection in the infant (CDC, 2012b). In developing countries diagnostics of gonorrhea is complicated due to required expensive testing equipment. Treatment of the disease is unpredictable, expensive and prolonged due to increasing number of gonorrhea strains being resistant to antibiotics most available in developing areas (Ray, Bala, Kumari, & Narain, 2005; Ison, Dillon, & Tapsall, 1998).
Syphilis prevalence has decreased significantly in majority of countries in last recent years but increased in some such as USA and China (Chen et al., 2007; CDC, 2010a). There are 12 million new cases of syphilis annually and 90% of them occur in developing areas (WHO, 2001). Syphilis starts usually with a painless ulcers and rash. In the final stage of the infection which may last for decades, symptoms often disappear. In the late stages of the disease, syphilis may cause internal organ damages, paralysis, blindness, dementia, and may potentially have lethal consequences (CDC, 2010a). In pregnant women, syphilis may cause premature birth, spontaneous abortion, stillbirth and congenital infection of the infant (Patel, Burnett, & Curtis, 2003; Dixon-Mueller & Wasserheit, 1991). Testing for syphilis is relatively inexpensive and easy but it is not always available in developing low-income countries (WHO, 2001). Syphilis is treatable with antibiotics.

Chancroid is a bacterial STI that is common mostly in less developed countries in Africa and Asia. Similar to syphilis, the symptoms of chancroid include ulcers in the genital area (NIH, 2011) as well as enlarged inguinal lymph nodes, abscesses, and pain when urinating and during intercourse. Chancroid is hard to diagnose but the infection is easily treatable with antibiotics (Workowski & Berman, 2010).

Trichomoniasis is one of the most common STIs worldwide. According to WHO (2001) estimations, there are 173 million new cases of trichomoniasis annually, and about 77 million of them occur in South and Southeastern Asia. About 50%-70% of this parasite-caused infection cases are asymptomatic (WHO, 2001; CDC, 2011a). If symptoms occur, females can experience itching, burning, redness or soreness of the genitals, abnormal discharge and feel unpleasant during intercourse (CDC, 2011a). Trichomoniasis is associated with increased transmission risk of other STIs, including HIV (Dixon-Mueller & Wasserheit, 1991) and may cause premature delivery and infant's low birth weight (CDC, 2011a). Trichomoniasis is curable with antibiotics., however, in developing countries, tests for trichomoniasis are often not available (WHO, 2001).

Human papillomavirus (HPV) is the most common STI worldwide with the prevalence of around 440 million. Incurable HPV is the main cause of cervical cancer as 99.7% of cervical cancer cases are caused by HPV, and 70% of those are caused by either high risk HPV types 16 or 18 (Muñoz et al, 2003; Walboomers et al, 1999). Besides cervical cancer, HPV can cause genital warts and other less common cancers, including cancers of the vulva, vagina, penis, anus, head and throat (CDC, 2012c). HPV is preventable by vaccines.
**Hepatitis B (HBV)** is an incurable virus infection with severe health outcomes, including chronic liver disease, cirrhosis and liver cancer. According to WHO (2008a) estimations, there are two billion HBV carriers, including 350 million individuals with chronic hepatitis. People infected with HBV are also in high risk group for HIV and other STIs (Patel, Burnett, & Curtis, 2003). HBV is often asymptomatic; however, it may cause fever, fatigue, nausea, abdominal and joint pain, dark urine and loss of appetite (CDC, 2010b). Besides getting infected with HBV during sexual intercourse, mothers can spread HBV during delivery to their newborn who has 90% chance of developing a lifelong chronic hepatitis (CDC, 2010c). HBV is preventable with three-shot vaccination (CDC, 2010b).

**Genital herpes** is an incurable STI most often caused by herpes simplex virus type 1 (HSV-1) and most often type 2 (HSV-2). The prevalence of the virus is generally higher in young females in urban settings in developing countries (WHO, 2001). It is estimated that there are approximately 536 million 15-49 year old individuals infected with HSV-2 worldwide, 315 million of them are females (Looker, Garnett, & Schmid, 2008). In South Asia, an estimated 33.2 million women have HSV-2 infection, and large majority of them do not know that they have it as herpes is often asymptomatic. If signs occur, an individual can experience painful and itching blisters and ulcers around genitals or rectum (CDC, 2012d). Infected individuals are more susceptible to HIV (Wald & Link, 2002) and in severe cases herpes may cause meningitis (WHO, 2005). During pregnancy, herpes may cause spontaneous abortion and preterm delivery (WHO, 2005). The virus can be passed from mother to child during delivery. The newborns may have eye, skin, lung or central nervous system infection and majority of infants with the latter either die or have permanent neurological damage (Brown, Gardella, Wald, Morrow, & Corey, 2005; Dixon-Mueller & Wasserheit, 1991).

**HIV** and **AIDS** remain major global health issues. According to latest estimations, approximately 33.4 million people live with HIV and annually 2.7 million new cases are added (WHO, 2010c). Although between 2001 and 2009, the global rate of new HIV cases decreased by almost 25%, in some countries mostly in Asia and Eastern Europe the data show more than 25% HIV incidence increase (UNAIDS, 2010). Individuals infected with HIV may be asymptomatic for a decade or longer (Bennett, 1994), however, if symptoms occur, they may include fever, thrush, diarrhea, vaginitis, weight loss, and skin changes (Bush, 1995). In long term and without treatment, HIV leads to acquired immune deficiency syndrome (AIDS),
making infected individuals susceptible to several potentially fatal opportunistic infections and cancers (Kaplan, Benson, Holmes, Brooks, Pau, & Masur, 2009). Spread of antiretroviral treatment has significantly reduced the number of deaths due to HIV/AIDS. In 2010, 1.8 million people died because of HIV/AIDS which is more than 20% less than in 2005 (Kaiser Family Foundation, 2011). In most cases, HIV is acquired through sexual intercourse; in addition, mothers can pass HIV to a newborn during pregnancy, delivery, or breast-feeding (CDC, 2012e).

2.2.1.2. Endogenous infections. Overall, endogenous infections are considered to be the most common cause of RTIs among women worldwide (Hawkes, Nayyar, van Dam, O'Reilly, Deperthes, & Agarwal, 2001). The most spread endogenous infections are bacterial vaginosis and candidiasis which are both caused by an imbalance of the normal vaginal ecology (de Wijgert & Elias, 2003).

**Bacterial vaginosis** is traditionally thought to be sexually transmitted infection; however, the etiology of the infection is still uncertain and recent research suggests a nonsexual mode of transmission (Bennett, 1994). Females with bacterial vaginosis have a vaginal pH greater than 4.5, and the symptoms may include white or gray vaginal discharge with an unpleasant odor, as well as itching around outside vagina and burning during urination (CDC, 2010d; Soper, 1995). Bacterial vaginosis is more likely to occur in females who practice vaginal douching and frequent bathing (Holzman, Leventhal, Qiu, Jones, & Wang, 2001), use detergents and disinfectants (WHO, 2005), and have several sexual partners (CDC, 2010d). Although endogenous infections are sometimes considered being less harmful than other reproductive tract infections, recent evidence has associated bacterial vaginosis with serious complications, including preterm delivery, pelvic inflammatory disease which can cause infertility and ectopic pregnancy, and increased susceptibility to several STIs, including HIV (CDC, 2010d).

**Candidiasis** or "yeast infection" is a common women's health issue caused by overgrowth of the yeast *Candida*. It is estimated that 75% of adult females experience candidiasis at least once during their lifetime (CDC, 2012f). Women with *candidiasis* have a vaginal pH less than 4.5 and may experience thick, curd-like discharge, genital itching and burning (CDC, 2012g; Soper, 1995), or painful intercourse (de Wijgert & Elias, 2003). Higher risk of candidiasis has been associated with use of oral and vaginal contraceptives (Sobel et al, 1998), wearing synthetic underwear or tight clothing (Haefner, 1999), and consumption of antibiotics (WHO, 2005).
2.2.1.3. Consequences of RTIs in developing countries. It is often believed in developing countries that RTIs are too complicated and expensive to treat and affect only small specific segments of sexually active adults as sex workers and therefore should not be prioritized as a public health issue (Dixon-Mueller & Wasserheit, 1991). Due to biomedical, behavioral, social, cultural, religious and economic barriers, the incidence and impact of RTIs, including STIs is estimated to be the largest in less developed countries. Therefore, RTIs are an area of concern especially in developing areas where options for diagnosis and treatment of the infections and related conditions are limited because of lack of resources and knowledge.

Young females in developing countries are in especially high risk group when contracting STIs and facing complications due these infections. Firstly, STIs are especially prevalent among younger people as about 60% of STIs occur among people between 15 and 24 (WHO, 2006). Previous research has indicated that young adults are more likely to acquire an STI because of several risk behaviors including having multiple sexual partners, practicing unprotected sex, and being engaged in substance and alcohol use which are often associated with greater risk of STIs (Eng & Butler, 1997). In addition, young adults, especially those who are socially and economically marginalized, are in higher risk of contracting a STI as they are often unable to insist the use of protection during intercourse (Dehne & Riedner, 2005).

Secondly, compared to men, due to physiological reasons women are more likely to become infected because of the greater efficiency of male-to-female transmission for most STI pathogens (World Bank, 1993). In addition, females face greater and more frequent complications because STIs are often asymptomatic in women and remain undetected or are harder to diagnose (Wasserheit & Holmes, 1992; Eng & Butler, 1997). In addition, low social status of women and lack of control over the conditions, under which sexual intercourse occurs, may also increase females' risk of contracting STIs (World Bank, 1993).

Furthermore, especially in less-developed areas, women often do not seek medical help for RTIs or conditions that are even remotely connected with sexual health due to socio-cultural barriers. Several studies (Chapple, 2001; Prasad et al., 2005; Go, Quan, Zenilman, Moulton, & Celentano, 2006; Rabiu, Adewunmi, Akinlusi & Akinola, 2010; Cunningham, Tschann, Gurvey, Fortenberry, & Ellen, 2002; Rizvi & Luby, 2004; Balsara et al., 2010) have indicated that symptomatic women in developing areas are often reluctant to seek treatment for their gynecological disorders due to feeling of shame and embarrassment, stigma, absence of female
doctors, mildness or short duration of symptoms from one side; and belief that their symptoms are a normal part of womanhood from the other side (Winkvist & Akhtar, 1997; Prasad et al, 2005; Mayank, Bahl, & Bhandari, 2001). Therefore, local reports tend to underestimate the number of RTI cases in the population in developing areas.

Female reproductive tract infections that usually originate in the lower genital tract may produce symptoms that cause extreme discomfort and chronic pain, however, often gynecological disorders are asymptomatic and signs of infections may often appear when it is already too late to avoid serious consequences. If undiagnosed or untreated, lower genital tract infections may result in upper tract infections that can have major or even fatal complications, especially in resource scarce settings as developing countries where early diagnosis and treatment are often not accessible. Every year approximately 275,000 women die due to cervical cancer caused by HPV (Ferlay, Shin, Bray, Forman, Mathers, & Parkin, 2010). Complications due gonorrhea and chlamydia can cause a potentially life-threatening pelvic inflammatory disease (PID), comprising a variety of upper genital tract inflammations (Patel, Burnett, & Curtis, 2003). Furthermore, STIs such as syphilis, herpes, chancroid that cause genital ulceration; and gonorrhea, chlamydia and trichomoniasis that may cause inflammation increase the risk of acquiring HIV three to ten times (Wasserheit, 1992; WHO, 2001; Cohen, 1998).

Besides physical burden, RTIs can have severe psychosocial consequences. Several studies have reported that women who have related STIs with anxiety, stress and depression. Individuals diagnosed with herpes simplex virus (HSV) have reported feeling fear, anger, guilt, shame and concern about transmitting the disease to a child or a sex partner after hearing the diagnosis. In addition, some individuals with HSV also feel sexually undesirable, socially stigmatized (Melville et al., 2003), isolated (Eng & Butler, 1997) and are concerned about social rejection and that others will learn about their condition (Rosenthal et al., 2006).

Likewise, females diagnosed with genital warts and asymptomatic HPV report experiencing emotional distress such as anger, anxiety, depression, fear of rejection, shame, and guilt, reduced sexual enjoyment and activity as well as negative impact on self-image (Clarke, Ebel, Catotti, & Stewart, 1996). In addition, HPV diagnosis may lead to self-inflicted blame (Filiberti et al., 1993) and raise trust and fidelity issues with intimate partners (McCaffery, Forrest, Waller, Desai, Szarewski, & Wardle, 2003).
RTIs may also lead to larger economic and social ramifications. Complications due to RTIs can greatly influence women’s social status in family and community especially in developing countries where women's main role is to give birth to healthy children (Wasserheit, 1989). RTIs can result in infertility and several pregnancy and fetus related conditions such as potentially fatal ectopic pregnancy, premature birth, fetal loss (miscarriage or stillbirth), low birth weight, infant blindness and mental retardation (Wasserheit, 1989; Wasserheit & Holmes, 1992; Nejad & Shafaie, 2008).

2.2.1.4. Reproductive tract infections in South Asia and Pakistan. Due to asymptomatic characteristics of RTIs, absence of diagnostic equipment, and underqualification of health care providers, diagnosing RTIs in developing countries is challenging and often inaccurate. Data available in South Asia on reproductive tract infections is mostly based on small samples of segmented population groups, such as females with specific symptoms in health or family planning centers, and count barely on health care provider's observations while excluding laboratory diagnose methods. However, some studies have shown a large gap between diagnoses based on clinical screening only compared to laboratory tests. For instance, a study from India suggested a possibility of over-diagnose of RTIs by physicians as although almost three fourth of patients had RTI-related complaints, only 32.2% of them were actually pathological (Ray et al., 2009). On contrary, a study on genital tract infections in Turkey indicated that compared to laboratory tests, the physicians diagnosed nearly one forth of cases as false negative for RTIs (Bulut, Yolsal, Filippi, & Graham, 1995).

Overall, studies have shown moderate to high prevalence of reproductive tract infections among South Asian women mostly due to a wide spread of endogenous infections. Majority of studies focusing on endogenous infections in South Asia have been conducted among various populations in India. The seven reviewed studies from India indicated high burden of RTIs among females with morbidity rate ranging from 28% to 92% (Patel et al., 2006; Prasad et al, 2005; Mayank, Bahl, & Bhandari, 2001; Bang, Bang, Baitule, Choudhary, Sarmukaddam, & Tale, 1989; Vishwanath, Talwar, Prasad, Coyaji, Elias, de Zoysa, 2000; Parashar, Gupta, Bhardwaj, & Sarin, 2006; Gard et al., 2002). The most prevalent RTI in urban populations was bacterial vaginosis: about 18%-41% of females were diagnosed with this infection, followed by
candidiasis with a prevalence rate ranging from 14% to 25% (Mayank, Bahl, & Bhandari, 2001; Vishwanath et al., 2000; Parashar, Gupta, Bhardwaj, & Sarin, 2006; Garg et al., 2002).

Hawkes et al. (1999) studied 320 women who turned to health centers in Matlab, Bangladesh with abnormal vaginal discharge and found 30% prevalence of endogenous infections in this sample. The prevalence of endogenous infections was moderate, ranging from 19% for bacterial vaginosis and 12% for candidiasis, and significantly greater percentages of infection were diagnosed among those women who used intrauterine contraceptives.

A similar study among vaginal discharge patients in Nepal showed remarkably higher prevalence rates of RTIs. In this study, 78% of females were diagnosed with candidiadis and 25% with bacterial vaginosis (Rizvi & Luby, 2004).

Limited data that is available about the prevalence of endogenous infections in Pakistan present controversial results. Most of the studies are either conducted among clinic patients or high risk groups such as sex workers. NACP (2005) studied female prostitutes in Lahore and Karachi, and found that 47.6% of sex workers in Lahore and 27.4% in Karachi had bacterial vaginosis. Studies in other populations in Karachi have shown similar results: on average 47.5% and 19.5% of females in four city's settlements were diagnosed with bacterial vaginosis or candidiasis respectively (Mahmood & Saniotis, 2011). However, other studies in Pakistan have shown significantly lower prevalence rates. A community-based study from Rawalpindi suggested that 17.4% of tested women had at least one endogenous infection: 10.3% were diagnosed with bacterial vaginitis and 6.8% with candidiasis (Durr-e-Nayab, 2005). Another study conducted in four cities (Karachi, Lahore, Peshawar, and Islamabad) showed that although 70% of females complained about backache and 63% about vaginal discharge, only 4% were diagnosed with bacterial vaginitis and 6% with candidiasis (NACP, 2001).

Compared to endogenous infections, STIs have relatively lower prevalence rates in South Asia. However, due to limited access to health care and lack of diagnosis tools, STI rates are often based on estimations and are believed to be underreported.

An estimated 151 million new cases of curable STIs occur each year in South and Southeast Asia (WHO, 2001). The morbidity rates of STIs in India have been ranged from 4.2% to 33%. Although relatively "innocent" trichomoniasis have shown the highest prevalence rates in most studies in South Asia, studies from India have suggested alarming results, indicating a wide spread of other STIs. Garg et al (2002) conducted a study among urban slum females in
Delhi and found that 29% of them were infected with chlamydia and 15% had HPV type 16 or 18. Another study from Delhi conducted among pregnant women resulted in diagnosing 12.2% of study participants with syphilis (Mayank, Bahl, & Bhandari, 2001). Furthermore, high rates of pelvic inflammatory disease, which in some studies have reached even 18% in study population (Parashar, Gupta, Bhardwaj, & Sarin, 2006), suggests that a number of Indian females risk their life due complications of untreated or undiagnosed STIs.

Studies in other South Asian countries have shown lower prevalence of STIs. Rizvi & Luby (2004) conducted a study in Nepal where majority of population are Hindus. They found that 17% of vaginal discharge patients were diagnosed with trichomoniasis, but only 3% of females had either gonorrhea or syphilis. In a study conducted among Bangladeshi women who had complaints of several RTI symptoms, only 3.7% of women were diagnosed of any STI, including trichomoniasis (1.5%), chlamydia (0.9%), active syphilis (0.9%) and gonorrhea (0.2%) (Hawkes et al., 1999).

Assessing the prevalence of STIs in Pakistan is hard as there are only a few research attempts in this field and there is no official STI databank. There are also no continuous statistics on the incidence and prevalence rates of STIs in Pakistan among general population, however, several socio-demographic indicators as well as several small-scale studies refer to potentially high levels of STI spread, especially among adolescents and young adults. Although some researchers have suggested that due to religious constraints Pakistani females are less likely to contract STIs, data suggests that Muslim women are just as susceptible to STIs as non-Muslim females (Hawkes et al., 1999; Duttagupta et al., 2004).

A recent study conducted among females in four Karachi settlements suggested especially high prevalence of trichomoniasis: 28.3% of study participants were diagnosed with this STI (Mahmood & Saniotis, 2011). In addition, the study showed relatively high morbidity of other STIs, including chlamydia (3.6%) and gonorrhea (2.6%). Other studies in urban settings have indicated quite high chlamydia rates, on average 7.8% in four main cities (NACP, 2001) and 5.3% among family planning and antenatal clinic female patients in Karachi (Wasti, Ashfaq, Ishaq, & Hamid, 1997). Only one community-based study in Rawalpindi aimed to establish baseline prevalence of STIs among women aged 14-45. The results showed that prevalence of STIs was low, ranging from 0.6% for trichomoniasis and chancroid to 0.3% for gonorrhea, chlamydia and syphilis (Durr-e-Nayab, 2005).
Among female sex workers in Pakistan, syphilis, genital herpes and gonorrhea seem to have the highest prevalence. Recent studies have shown that 44% of female sex workers in Hyderabad, 7.1% in Lahore and 3.6% in Karachi were carrying syphilis (Bibi, Devrajani, Shah, Soomro, Jatoi, 2010; NACP, 2005). Furthermore, 9.8% and 12% of female sex workers in Karachi and Lahore respectively were diagnosed with gonorrhea (NACP, 2005). In addition, chlamydia and trichomoniasis showed relatively high morbidity, ranging from 5.2% and 19.3% for trichomoniasis and 5.2% and 11% for chlamydia.

Similarly, Hawkes et al. (2009) studied female sex workers in Rawalpindi and Abbottabad and witnessed somewhat lower prevalence rates. According to their study, 4.7% and 8% of female prostitutes in Rawalpindi and Abbottabad respectively were diagnosed with genital herpes virus, followed by trichomoniasis (4.3% and 5.7%), gonorrhea (1.9% and 2%), syphilis (1.2% and 2.8%), and chlamydia (0.9% and 1.7%).

Human Papillomavirus is also a sexually transmitted infection that Pakistani young women are potentially susceptible of especially due to an increasing number of premarital sexual relationships. Although, it has been suggested that Muslim women in general are less susceptible to HPV, it is most likely the result of paucity of data and the problems faced by researchers when asking the Muslim women to self-report their sexual health history. On average in Pakistan, less than 2% of women have been tested for HPV and there is no information about the prevalence of the infection in the country (WHO, 2010b). HPV is especially threatening for young females as around the world the highest HPV infection rates are found among females under age 25 (Dunne et al, 2007; Koutsky, 1997). Cervical cancer which is caused by HPV is the second most common cancer diagnosed in Pakistani women. It is estimated that every year about 11,700 Pakistani women are diagnosed with cervical cancer and more than 7,300 die from the disease yearly (WHO, 2010b). However, the knowledge of HPV is low and barely any preventive methods are used. A study conducted by Imam et al. (2008) indicated that only 5% of the participating females are aware about cervical cancer screening and only 2.6% of them had ever received a Pap-test (Imam et al., 2008).

As mentioned before, UNAIDS (2010) estimates that approximately 33.4 million people live with the HIV virus worldwide, most of them in low-income countries in Sub-Saharan Africa and South and South-East Asia. The same report indicates that although in most regions of the world the epidemic appears to have stabilized, the prevalence continues to increase in some areas
like Bangladesh, Pakistan and the Central Asian countries. Although the prevalence rates of HIV/AIDS in Muslim countries may seem small when compared with the epidemic in Sub-Saharan Africa, they stand in sharp contrast to official estimates that suggest no disease at all (Eberstadt & Kelley, 2005). According to UNAIDS (2010) estimations, approximately 98,000 HIV positive people are currently living in Pakistan. In 2005, a study was conducted to measure HIV prevalence among high risk groups as commercial sex workers, truckers, hijras (transgendered) and injecting drug users (IDU) in Karachi and Lahore. The results showed that 23.5% of IDUs, 4.5% male sex workers, 2.5% of hijras, 1% of truckers and 0.5% of female sex workers were HIV positive (Bokhari et al., 2007). Clearly, sexual partners of these individuals are in risk of contracting HIV in the future. UNAIDS (2010) already suggests that in the Asian region HIV has potential to spread to low risk groups and transmit through heterosexual transmission among couples.

2.2.2. Unintended Pregnancies

In spite of political struggles and social and religious constraints in Pakistan, reproductive health initiatives have had some effect as general knowledge about contraceptives has significantly improved over the last few years. Pakistan Demographic and Health Survey 2006-07 indicated that 87.5% of married 15-19 year old females were aware of at least one contraceptive method and 87.4% knew at least one modern contraceptive method (Ahmad & Eskar, 2008). The knowledge level is similar among unmarried young females. A pilot study conducted in rural, periurban and urban areas in Pakistan showed that 85% of 13-21 year old unmarried girls had heard of contraceptives (Qazi, 2003).

However, it is evident that knowledge does not always lead to behavior change. Pakistan continues to have the highest fertility rates in South Asia: in 2005-2010, the country's fertility rate was 3.65 children per woman, compared to 2.73 in India and 2.38 in Bangladesh (United Nations, 2011a). It is estimated that Pakistan's population will be doubled in the next four decades, reaching 335 million people by 2050 (United Nations, 2011b).

Although abortions are illegal in Pakistan, an estimated 900,000 induced abortions occur every year in the country associated with premarital or unwanted pregnancies. In other words, one in four pregnancies in Pakistan is unplanned and every seventh pregnancy is terminated by abortion (Sathar, Singh, & Fikree, 2007).
Because of unsafe abortions, lack of knowledge, lack of proper antenatal care and inaccessibility to qualified health services, the maternal mortality ratio is alarming in Pakistan. According to the Pakistan Demographic and Health Survey 2006-07, overall maternal mortality ratio is 276 maternal deaths per 100,000 live births. Thus, it is estimated that approximately 1 in 89 women will die of maternal causes during her lifetime in Pakistan. Infant mortality rate is 78 deaths and under-five mortality rate is 94 deaths per 1,000 live births. In other words, one in every eleven children dies before his or her fifth birthday (Midhet, Jafarey, Ahsan, & Sheraz, 2006-07).

2.2.3. Preventing RTIs and Unintended Pregnancies

Although abstinence from oral, vaginal and anal sex is considered the only fully effective way of preventing STIs and unintended pregnancies, majority of young females all over the world already start their sexual life in their teen years.

There are several ways young individuals can reduce their risk of contracting STIs, however, none of them is fully reliable. Limiting the number of sexual partners, avoiding risky sex practices, and using a condom are practices considered to reduce the risk of getting an STI. In addition, pre-exposure to vaccination helps to significantly reduce HPV and Hepatitis B risk (Workowski & Berman, 2010) but it does not protect young females from unintended pregnancy.

According to the classification of United Nations (2010), contraceptives can be divided into two categories: modern and traditional. Modern contraception methods include male and female condoms, hormonal pills and injectables, intra-uterine devices (IUD), implants, male and female sterilization, and emergency contraception. Traditional methods include withdrawal, periodic abstinence (also called rhythm and fertility awareness method), prolonged abstinence, douching, lactational amenorrhea method (breastfeeding), and folk methods. Although the traditional methods have proven to be much less effective than modern methods, they have several advantages such as low cost, no medical side effects and they are easily teachable (Burkhart, Mazariégos, Salazar, & Lamprecht, 2000).

The following section gives an overview of the seven more common contraception methods in developing countries.
2.2.3.1. Modern contraception methods. Male condom is the only contraceptive that is effective against transmitting most STIs and works in 82%-92% cases when preventing pregnancy (CDC, 2012h). There are also female condoms available but they are not widely spread in less developed areas due to their high cost.

Hormone pills either contain hormones estrogen and progestin or progestin only. If taken properly at the same time daily, the pills are 91%-99% effective at preventing pregnancy (CDC, 2012h) but they do not protect against STIs. Hormone pills can cause irregular bleeding, headaches, breast tenderness, nausea, depression, anxiety, acne, and cardiovascular problems (ACOG, 2003).

Injectable hormones are effective at preventing pregnancy 94%-99% of cases (CDC, 2012). Depending on the type of hormone that is used, the effect of injections last from one to three months. Similarly to hormone pills, the injectible hormones can have a number of side effects, including headaches, irregular menstruation, depression, anxiety, acne, and weight gain (ACOG, 2003).

Intrauterine device (IUD) is a T-shaped device that is placed in the uterus by a health care provider and it can stay there for up to ten years (CDC, 2012h). The IUD is more than 99% effective at preventing pregnancy but does not protect against STIs. The device works by either releasing a small amount of hormone progestin or copper in the uterus (ACOG, 2003). The side effects of IUDs include heavy, irregular or painful menstruation and vaginal discharge (ACOG, 2011). As previously discussed in this dissertation, some studies have found that use of IUDs increase the risk of candidiadis (Parewijck, Claeys, Thiery, & van Ketz, 1988; Sobel et al, 1998).

Female sterilization is a permanent method for preventing pregnancy by surgically closing fallopian tubes. The method is effective 99.5% of cases and the only risks are related to postsurgical complications (ACOG, 2003).

2.2.3.2. Traditional contraception methods. Withdrawal refers to contraception method that prevents pregnancy by pulling the penis out of the woman before ejaculation. Due to timing issues and the sperm that can be in the fluid before ejaculation, this method has low effectiveness and does not work in 20% of the cases (ACOG, 2003).

Rhythm method refers to avoiding sexual intercourse during ovulation, the most fertile time in woman's menstrual cycle. Rhythm method is effective in 75% of cases (ACOG, 2003).
2.2.3.3. Contraceptive use and safe sex practices in Pakistan. In 2009, the prevalence of any contraception use in South Asia was 54%, the lowest percentage among all regions in Asia (United Nations, 2011c). Pakistan has a great role in this figure. The proportion of 15-49 years old married Pakistani females or their sexual partners who used at least one method of contraception in 2008 was only 27%, which has decreased by 5.1% compared to 2003 (United Nations, 2011d). Even though an increasing number of females prefer to delay or space births, often women do not have access to family planning services and do not use any method of contraception. As a result, the country has one of the world's highest unmet need of family planning. A 26.6% of 15-19 year old females and 42.5% of 20-24 year old females who want to use family planning for spacing out their children or for restricting their family size have a met need of 6.7% and 15.4% respectively, this leaves a significantly high unmet need of 20% and 27.2% (Ahmad & Eskar, 2008).

Overall, according to the Pakistan Reproductive Health and Family Planning Survey 2000-2001, 20.2% of married female Pakistanis and their sexual partners use modern contraception methods and 7.4% traditional methods. The most common contraception method is female sterilization (6.9%), followed by male condom (5.5%) and withdrawal method (5.3%).

Studies among more educated urban Pakistani females have shown higher use of contraceptives. A study among female college students showed that the main STI and unwanted pregnancy prevention method is practicing abstinence. In that sample that included married and unmarried 18-24 years old females, 51.7% of students protect themselves by practicing abstinence. In addition, 39% of the participants claimed to use a condom, 21.5% are having a monogamous relationship and 4.9% ask the partner about STIs before having sex (Vahe, 2012). At the same time, only 64.2% of sexually active respondents reported that they always use a condom when having sex, 17.0% claimed that they use a condom most of the time, 8.5% use a condom sometimes, 4.7% rarely and 5.7% never use a condom when having sex. Only 7% of sexually active students had taken regularly (more than two months) birth control pills. A 1.9% of sexually experienced respondents had not used any method for preventing STIs or unwanted pregnancies (Vahe, 2012).

A few studies that have focused on contraceptive use among unmarried individuals indicate that majority of sexually active never married young females do not use any contraceptive method (Pachauri & Santhya, 2002). However, a recent study conducted among
college females in Lahore indicated quite opposite results: 87.8% of sexually active unmarried females reported using a condom, however, approximately one fifth of participants said that they are not using it every time they have sex (Vahe, 2012).

### 2.3. Female Cancers

Breast cancer has the highest incidence and mortality rates among females worldwide, accounting for 23% of all new cancers in women (Ferlay et al., 2010; IARC, 2002). Every year approximately 1.4 million women are diagnosed with breast cancer and about 460,000 females die because of it. Although in literature breast cancer incidence is often associated with high-income countries, nearly 70% of breast cancer deaths occur in low and middle income countries (WHO, 2008b). Due to lack of systematic screening and education, low awareness and inaccessible treatment and diagnosis facilities, low-income areas have significantly lower breast cancer rates compared to developed countries (Coleman et al., 2008). In coming years, it is estimated that breast cancer incidence rates will continue increasing especially among urban women in developing counties mostly due to the adoption of Western lifestyles, including changed dietary habits, reduced physical exercise and delayed childbirth, which all increase the risk of breast cancer (Anderson et al., 2008).

Although in most countries in Asia age-adjusted rate (ASR) of breast cancer incidence among females is low, breast cancer is the second frequent cancer among South and Central Asian women with 173,000 new cases and causing 83,000 deaths annually (Ferlay et al., 2010). In Pakistan, breast cancer is the most common cancer among females, showing the highest incidence rate in the region. The ASR for breast cancer incidence among Pakistani women is 31.5 per 100,000 people, which means that every year more than 19,000 females are diagnosed with breast cancer (Ferlay et al., 2010). Some studies in certain populations in Pakistan have shown significantly higher female breast cancer incidence rates. According to Karachi cancer registry data from 1995-1997, the ASR of breast cancer incidence in Karachi was 51.7 per 100,000 which is the highest in Asia, excluding Israel (Bhurgri, et al., 2000). Furthermore, the age-standardized mortality rate of 18 per 100,000 people is significantly higher compared to the world average, indicating that more than 10,000 Pakistani females die annually due to this disease (Ferlay et al., 2010).
Each year approximately 529,000 women are diagnosed with cervical cancer worldwide (Ferlay et al., 2010). Although mortality rates caused by cervical cancer have declined steadily over the past decades due to prevention and early detection, this is not the case in developing countries which account for a combined 85% of cervical cancer cases. In 2008, cervical cancer was the second largest cause of female cancer mortality in the world, being responsible for 275,000 deaths and nearly 90% of them occurred in developing countries (Ferlay et al., 2010).

Cervical cancer is the second most common cancer diagnosed in Pakistani women. With ASR of cervical cancer incidence rate of 15.7 and mortality rate of 12.9 per 100,000, every year about 11,700 Pakistani women are diagnosed with cervical cancer and more than 7,300 die from the disease yearly (Ferlay et al., 2010). However, the knowledge on preventive methods is low and barely any of them are used. A study conducted by Imam et al. (2008) indicated that only 5% of the participating females are aware about cervical cancer screening (Imam et al., 2008) and on average only 2% of them have been screened at least once in every three years (WHO, 2010b; Imam et al., 2008).

2.3.1. Prevention of Female Cancers in Pakistan

This dissertation focuses on two female cancer prevention behaviors – breast self-exams (BSE) for breast cancer and HPV vaccination for cervical cancer.

*Breast self-examination.* Early detection of the disease is the key factor in reducing the mortality resulting from breast cancer. For reaching the highest sensitivity in detecting breast cancer, a combination of mammography, clinical breast exam and BSE should be used. However, the first two methods are recommended for women over 40 years of age and are often not accessible in low-income areas. According to the American Cancer Society (2011) recommendations, young females in their 20s should perform monthly BSEs as a screening method for detecting early breast cancer. During the BSE, the woman can use different techniques to systematically examine her breast for unusual lumps, shape, or skin changes (American Cancer Society, 2011). BSEs have several advantages, including low cost, possibility for monthly assessment and having no barriers associated with accessing health care (Janz, Becker, Anderson, & Marcoux, 1989-1990).

Although some organizations and researchers have questioned the effectiveness of BSEs in increasing breast cancer diagnoses or decreasing breast cancer deaths (Green & Taplin, 2003;
Baxter, 2001; Hackshaw & Paul, 2003), some sources indicate that up to 70%-90% of breast cancers are detected by performing a BSE (NBCF, 2002; Foster, Worden, Costanza, & Solomon, 1992). In addition, BSEs are considered to be a beneficial tool for increasing women's awareness of breast changes, becoming more comfortable with their breasts and raise their sense of control over their health (Allen, van Groningen, Barksdale, & McCarthy, 2010).

Although BSEs have lost their importance due to wider spread of mammography, Pakistani women do not use this screening option due to low awareness and knowledge, low self-efficacy, ignorance or because of economic or cultural reasons. Maqsood et al. (2009) conducted a cross-sectional study among over 40 year old women in Lahore and found that less than 5% of participants had ever got a mammogram and less than 7% had received clinical breast exam. A study conducted among females in Karachi indicated that breast self-exams and mammography are rare among women. Furthermore, even when a lump is discovered in the breast, many females delay seeking medical help because of ignorance due to low awareness or fear, taboos related to cancer (Malik, 2002) as well as belief in alternative therapies such as herbal or homeopathic medicines (Malik, Khan, & Khan, 2000).

Similar results have been found in studies among Pakistani females in other countries. A study in United Kingdom indicated low levels of knowledge on BSE and lack of regular practice of BSE among Pakistani and Indian women (Bhakta, Donnelly, & Mayberry, 1995). In addition, similarly to sexual health topics, talking about breast problems is considered to be a taboo among South Asian women and performing a BSE make them feel uncomfortable. In addition, women generally do not practice any preventive behaviors and turn to a medical professional only in case there were symptoms (Bottorff et al., 1998). Another study in the U.S. among Middle Eastern Asian Islamic immigrants showed that although majority of women had heard of BSE, none of the participants had examined their breasts during the past year (Rashidi & Rajaram, 2000).

As a result of the lack of preventive behaviors, Pakistani females who are diagnosed with breast cancer typically already have advanced stage of breast cancer (Malik, 2002). Therefore, although BSE has a diminishing role in developed countries, its relevance as a tool of detection breast cancer in an early stage cannot be underestimated in low resource settings with certain conservative socio-cultural conditions such as those in Pakistan.
**HPV vaccination.** Unlike other STIs, HPV spreads through skin contact, thus, condoms have only limited effectiveness against protection from HPV (Winer et al, 2006). As of April 2013, two HPV vaccines have been approved around the world and both have also been introduced in Pakistan. Merck's vaccine Gardasil protects against HPV type-6 and type-11 which cause genital warts as well as against type-16 and type-18 which cause cervical cancer; whereas GlaxoSmithKline's vaccine Cervarix protects only against cancer-causing HPV type-16 and type-18 (Sherris et al., 2006). HPV vaccine consists of three doses and is recommended for teenagers and women before starting their sexual life (CDC, 2011b).

HPV vaccine could be especially beneficial in less developed areas where there are no cervical cancer screening programs. Even though in developing countries, vaccines may not be widely accessible without subsidies, the GAVI Alliance has already taken first steps to make HPV vaccine affordable for several developing countries such as Pakistan.

A recent study among Pakistani college females in Lahore showed that 3.9% of the study participants had heard of HPV vaccine but none of them were vaccinated against the infection (Vahe, 2012).

### 2.4. Potential of Web-based Health Interventions

Internet usage rates are skyrocketing throughout the world. From 2000 to 2010, Internet use has increased by 480%, reaching more 2.1 billion users in 2011 (IWS, 2011). As a result of this growth, an increasing number of people now use the Internet for health purposes. For instance, according to a recent study in the U.S., 80% of Internet users or 95 million Americans have stated that they use the Internet for searching for health related information (Fox, 2011).

Emerging technologies have added several new possibilities for health care, starting with providing health information, telemedicine and online counseling, health self-management features, online social support groups as well as adding new channels for health interventions. Studies have shown that compared to traditional intervention methods, web-based solutions have unique advantages, including reduced costs, increased convenience for users, reaching stigmatized or hard-to-reach populations, as well as the ability to overcome isolation of time, mobility, and geography (Griffiths, Lindenmeyer, Powell, Lowe, & Thorogood, 2006).
Cushing & Steele (2010) divided health education programs into two groups – educational and behavioral interventions. The educational/instructional approach is focused on delivering knowledge by using one-way communication. However, as purely educational interventions have not shown noticeable results in behavioral change (Cushing & Steele, 2010; Evans, Edmundson-Drane, & Harris, 2000), therefore, there is a need for an alternative intervention method, one that has shown larger effects on individual's behaviors.

Recent meta-analyses have shown that computer-based interventions have been successful in affecting individuals' health behaviors. Indeed, Portnoy et al. (2008) analyzed 75 randomized controlled trials using ICT-based interventions and found that these had significant impact on nutrition, tobacco use, substance use, binge/purge behaviors, general health maintenance as well as safer sexual behavior.

A meta-analysis by Noar, Black, & Pierce (2009) that focused on computer-based HIV prevention interventions and based its findings on twelve studies published between 2002 and 2008, suggested that computer-based interventions have similar efficacy as traditional human-delivered prevention programs. The researchers found that computer-based interventions were especially successful in promoting condom use, and statistically significant effect sizes were also found for frequency of sexual behavior, number of partners, and incidents of transmitted diseases. The meta-analysis also found that interventions are most efficacious when they are directed at a single sex (men or women), probably because they can be more highly customized and targeted (Noar, Black, & Pierce, 2009).

The most recent meta-analysis on the effectiveness of interactive computer-based interventions in high-income countries indicated that interactive interventions worked well to increase sexual health knowledge, being even more effective than face-to-face sexual health interventions (Bailey et al., 2010). In addition, computer-based interventions had little effect on safer sex self-efficacy, intentions, and sexual behavior.

A study by Crepaz et al. (2006) had even more optimistic conclusions. When studying HIV interventions from 1988-2004 targeted to people living with HIV, they found that interventions had significant effect on behavioral outcomes, starting with reduced unprotected sex and decreased acquisition of STIs. The meta-analysis indicated that interventions that were based on behavioral theory, were specifically designed to change HIV transmission risk behaviors, provided skills building or addressed a whole set of issues related to HIV, mental
health or medical adherence were especially effective in reducing sexual risk behaviors (Crepaz et al., 2006).

2.4.1. Effectiveness of Web-based Sexual Health and Breast Cancer Prevention Interventions

Several theoretical frameworks, including the health belief model, the theory of planned behavior, the transtheoretical model, and the social cognitive theory, suggest that health behaviors are mediated by several factors like knowledge, attitudes, beliefs, self-efficacy, intentions, perceived severity and susceptibility, and social norms.

Although researchers agree that increase in knowledge does not automatically lead to changes in behavior, knowledge is still considered to be a necessary factor that indirectly affects behavior change (Cushing & Steele, 2010; Roberto, Zimmermann, Carlyle, & Abner, 2007; Evans, et al., 2000; Kok, Harterink, Vriens, de Zwart, & Hospers, 2006; Strecher, 2007; Egger, Spark, & Donovan, 2005).

2.4.1.1. Effects on knowledge. Knowledge of STIs and safe sex. Several studies have shown that web-based sexual health interventions have significantly improved knowledge related to sexual health among different populations and have shown better or the same level change in knowledge as traditional sexual health education materials. A recent meta-analysis of 20 sexual health studies showed that knowledge was the most often measured variable with a significant effect size (d= .276) (Noar, Pierce, & Black, 2010).

Most of the studies measuring sexual health knowledge change have been conducted among college students. For instance, Evans et al. (2000) measured the effectiveness of a computer-assisted instruction based intervention on HIV/AIDS prevention among undergraduate students and found that participants in the treatment group scored significantly higher on the AIDS knowledge scale. Similarly, Kiene & Barta (2006) conducted a study among college students to measure the effectiveness of a computer-based HIV intervention. Their study supported previous results, showing significantly higher condom use knowledge among participants in the intervention group. Similar results have also been seen among middle and high school students. Experiments conducted among teenagers measured the effects of a web-based intervention with an aim to prevent STIs, unintended pregnancy and HIV. The results of
these studies indicated that the treatment group participants outperformed students in the control group on knowledge (Roberto, Zimmermann, Carlyle, & Abner, 2007; Roberto, Zimmerman, Carlyle, Abner, Cupp, & Hansen, 2007; Roberto, Carlyle, Zimmerman, Abner, Cupp, & Hansen, 2008).

Web-based sexual health interventions have also shown success in increasing knowledge outside the U.S. For instance, a study among Chinese high school students in Shanghai reported that after a 10-month web-based multimodal intervention on sexual and reproductive health, the median scores of overall knowledge and of each specific aspect of reproductive health (including reproduction, contraception, condom use, STI prevention, and HIV/AIDS) were significantly higher in the intervention group compared to control group (Lou, Zhao, Gao, & Shah, 2006). Similarly, a study in rural China measured the effectiveness of a web-based intervention that included 52 different weekly programs related to STI and HIV prevention. Analysis of the pretest and post-test among villagers and students in a rural school showed that health knowledge in most areas was significantly higher in the intervention groups compared to control group (Tian, Tang, Cao, Zhang, Li, & Detels, 2007).

Several studies have also measured STI prevention knowledge change in high risk groups such as men who have sex with men (MSM) or drug addicts. For example, a study comparing therapist-delivered and computer-delivered HIV/AIDS education among injecting drug users indicated that individuals in the computer-based intervention group learned and retained in long-term memory significantly more information about HIV prevention (Marsch, & Bickel, 2004). Similarly, a study among men who have sex with men in rural U.S., Bowen, Williams, Daniel, and Clayton (2008) suggested that the internet can be an excellent medium for delivering HIV risk reduction interventions to marginalized groups. Among other findings, the studied MSM showed (short-term) significant increase in knowledge on HIV/AIDS and knowledge related self-efficacy (Bowen, Horvath, & Williams, 2007; Bowen et al., 2008).

However, the effects of online interventions cannot be considered to be always successful. Some studies measuring the effect of web-based sexual health interventions on knowledge have not found any significant results. For instance, a randomized controlled study measured the effectiveness of internet-based HIV intervention among Hong Kong Chinese MSM and concluded that the intervention did not bring about any improvement in terms of knowledge (Lau, Lau, Cheung, & Tsui, 2008).
Knowledge on breast self-exam. There are a few studies that have measured the effectiveness of computer-based breast self-exam instruction in changing knowledge and they have reported mixed results. An intervention using a multimedia breast cancer prevention kiosk that was designed for low income Latina population in the U.S. showed promising results in knowledge increase among targeted females. The women were randomly assigned into pre-exposure control group and post-exposure intervention group. The results indicated that the intervention group participants had significantly higher knowledge scores about breast cancer risk factors and prevention, including the knowledge about BSE frequency (Valdez, Banerjee, Ackerson, & Fernandez, 2002).

A study conducted among 58 small town females in the U.S. measured the effectiveness of computer-based BSE instruction compared to a pamphlet. Although the results did not show any significant difference between groups for knowledge scores, there women who were exposed to the computer-based instruction reported a higher self-efficacy to perform BSE immediately after the training as well as one month later (Reis, Trockel, King & Remmert, 2004).

2.4.1.2. Effects on attitudes and behavioral intentions. The transfer of knowledge into action is dependent on wide range of factors, including individual’s attitudes. However, compared to knowledge, attitudes are generally harder to change.

Safe sex practices. Computer-based interventions have shown significant impact on attitudes related to sexual health and condom use. A recent meta-analysis showed that interventions using individual level tailoring as well as online interventions compared to offline ones were more likely to have improved attitudes toward safe sex and condom use (Noar, Pierce, & Black, 2010).

A study conducted among Chinese high school students' found that a web-based intervention on sexual and reproductive health had great impact on their attitudes. After intervention, students were less liberal toward sex and at the same time showed more positive attitudes toward the provision of contraceptives for unmarried people (Lou et al., 2006). Noell, Ary, & Duncan (1997) studied the effects of interactive video-based program targeting sexual decision making and social skills among students in the U.S. The study results indicated that the intervention had significant effect on the belief that sex is the result of one's own decisions, and had marginally significant effects on the level of perceived risk for unprotected sex (Noell et al.,
The authors suggested that two factors – interactivity and matching video material with student’s race/ethnicity – were the key for successful outcome, referring to the importance of customization in health interventions.

Also Evans and her colleagues (2000) suggested that students who participated in the human sexuality course by using computer-assisted instruction reported having more attitudes in favor of responsible sexual behavior compared to the lecture-based no intervention group. For instance, the students in the intervention group scored significantly higher on the scales measuring self-evaluative outcome motivation, physical outcome motivation and social outcome motivation. Encouraging results from two studies conducted among high school students showed that after seven 15-minute intervention sessions that aimed to increase perceptions of threat and efficacy, the experimental group students demonstrated significantly greater attitudes toward waiting to have sex and were also less likely to initiate sexual activity (Roberto et al., 2007; Roberto, Zimmerman, Carlyle, Abner, Cupp, & Hansen, 2007). Finally, in a trial on an online HIV prevention intervention conducted among rural Wyoming MSM reported that the participants had more positive attitudes toward condom use after participation (Bowen et al., 2007).

On the contrary, some studies have shown that web-based interventions do not always have impact on attitudes regarding sexual behaviors. Kiene & Barta (2006) found no significant condom-related attitude change in the intervention group members who passed computerized HIV/AIDS risk reduction intervention compared to a control group that participated in a nutrition education tutorial. Van Laar (2000) conducted an experiment among adolescent females where the treatment group participated in an intervention regarding beliefs about contraceptives and the control group was exposed to an intervention focusing on career beliefs. Similarly to Kiene & Barta (2006), Van Laar (2000) did not find any differences between groups when measuring attitudes toward condoms or sexual risks.

Breast Cancer Prevention. There are only a few studies that have measured the impact on computer-based interventions on breast cancer prevention attitudes and intentions. A study measuring the effectiveness of computer-based information kiosk among low income Latino females showed that overall there was statistically significant difference in attitudes and beliefs regarding breast cancer prevention behaviors between the treatment and control group. The
major difference that was noticed was for the knowledge and belief that breast cancer could be cured if detected early (Valdez et al., 2002).

Some studies have suggested that computer-based interventions have great potential in increasing adherence to breast cancer preventive behaviors. A study among Taiwanese females compared the effectiveness of tailored web-based education tools and regular pamphlets in communicating messages about breast cancer prevention. Lin & Effken (2010) found that those Taiwanese women who were exposed to the tailored web-based education site had significantly more positive perceptions of mammography and more intention to obtain mammography.

Similarly, a study among Black women in the U.S. compared the effectiveness of interactive computer-based intervention, video-based and a pamphlet. Among these conditions, the participants in the computer intervention group showed the greatest level of adherence to mammography (Champion et al., 2006).

In summary, due to a number of randomized controlled trials conducted in recent years, the understanding about the effects of computer-based interventions and mediating factors for health-related behavior change have improved significantly. However, there is a contextual and ecological caveat, as all the studies included in the abovementioned reviews were done in high- or middle-income economies and there is limited data on the effectiveness of such interventions in developing countries.

2.4.1.3. Impact of computer-based health interventions in developing countries.

Some researchers (e.g. Barak & Fisher, 2001) have suggested that web-based health interventions could be especially suitable in certain cultural contexts where some health issues are perceived as taboo, or learning about sensitive health topics is considered to be a private matter.

The high startup costs of computer-based interventions, especially in cases where the necessary hardware is not readily available, proves to be negligible for web-based solutions as it is mostly a fixed cost diluting over each additional user, making it cheaper with every additional person served (Wingwood et al., 2011; Griffiths et al., 2006; Barak & Fisher, 2001). Therefore, web-based sexual health and cancer prevention interventions could have great potential especially in low-resource settings. However, interventions from developing countries have rarely been studied and little evidence is available on the effectiveness of these programs in less
developed areas. There have been attempts to analyze the efficacy of mass communication based programs targeting HIV/AIDS-related behaviors (e.g. Bertrand, O’Reilly, Denison, Anhang, & Sweat, 2006), however, the analysis have not included internet as a medium. Descriptions of programs without evaluative assessment make it hard to analyze their effectiveness.

There are a few examples of computer-based sexual health interventions from Africa and Asia that provided some evaluation of their impact in the targeted population. The World Starts With Me was a wide-scale computer-based intervention that was launched in Uganda in 2003. It is an intervention targeted to males and females aged 12-19 with an aim to increase knowledge on sexual behavior and reproductive health, as well as to improve computer skills and awareness on human rights. The fourteen topics were presented to the participants by virtual educators who were the main sources of knowledge. Each section included theme-based warming-up activities, a game (e.g. the "body change game") or a quiz and an assignment with an aim to help students internalize what they have learned. The main part of most lessons was a creative assignment (e.g. creating a storyboard, an art work or conduct a role-play addressing the topic of the lesson) (Rijsdijk et al., 2011).

The evaluation of The World Starts With Me suggested that the intervention had positive effects on the beliefs regarding what could or could not prevent pregnancy, as well as positive effects on attitudes, self-efficacy and intention toward condom use (Rijsdijk et al., 2011). The intervention affected individuals' perception on social norms towards delaying sexual intercourse and their intention to delay sexual intercourse. In addition, the study found that participants had higher self-efficacy in dealing with sexual violence like pressure and force for unwanted sex. Finally, a reversed (negative) effect of intervention was found on knowledge scores relating to non-causes of HIV like petting, fondling and deep kissing. The study also found that most of the abovementioned positive effects disappeared when less than seven out of fourteen lessons were implemented in schools (Rijsdijk et al., 2011). Based on the project report (Reinders, Darwisyah, Okwput, Wongwareethip & Obbuyi, 2006-2007), it can be concluded that the main barriers for this intervention were caused by the shortage and old age of computers as in some cases up to five students had to share a computer during the class period which may have influenced learning, especially when talking about sensitive topics and personal experience. Secondly, the program developers had to manage barriers based on misconceptions and taboos as in some cases teachers, parents and community members who oppose sex education at school did not support
the implementation of the intervention. Thirdly, as the intervention used participatory and interactive approach, it was hard for some teachers to implement it as they were used to traditional lecture-type teaching methods. Finally, in some areas there was a lack of access to youth-friendly health services in students' local areas. Thus, even when students were aware of necessity behaviors, they did not have access to testing or additional counseling in some regions.

In couple of years after the program lunch, *The World Starts With Me* was adapted in Kenya, Indonesia, Thailand, South Africa, India and Vietnam. For instance, in Indonesia the intervention was called *Daku* and it was targeted to secondary school students only. As the schools were allowed to partly decide which parts of the program they will implement, they could leave out sex education from the curriculum and focus on other topics. Within three first years of the program, about 5,300 students had participated in *Daku* in 15 schools in Jakarta, Bali and two provinces. In addition, a special version of the intervention called *Seru* was developed targeting male adolescents in juvenile correctional institutions in Indonesia discussing among others topics such as physical and sexual development, safer sex and healthy relationships with romantic partners (WPF, n.d.). Unfortunately, there is no research measuring the impact of *Daku* or *Seru* in Indonesia.

*TeenWeb* was a similar intervention in Kenya and later in Brazil that was targeted to high school students. It included five web-based health education modules, which in eight to ten months covered topics such as substance use, sexuality, contraception, condom use, HIV/AIDS counseling and testing, abortion law and sexual violence. Halpern, Mitchell, Farhat, & Bardsley (2008) evaluated the effectiveness of *TeenWeb* in Kenya and Brazil and found that the intervention influenced individuals’ beliefs about and attitudes toward condoms, in some cases knowledge on emergency contraception, its effects and where to purchase it. In addition, *Teen Web* had impact on Kenyan students' knowledge on the laws regulating termination of pregnancy. However, although most measures used in the study showed significant differences between students in the intervention and control group, only about half of the differences were in the hypothesized group, probably due to inadequate exposure to educational materials (Halpern et al., 2008). The main challenges when implementing *Teen Web* were caused by technical issues (e.g. low bandwidth) and computer literacy issues. In addition, the intervention was not sustainable as after the research project was over, no funding was available for schools to continue internet service and participating in the intervention (Agbemenu, 2009).
Learning About Living is an e-learning system on reproductive health, STIs, gender roles, relationships, personal skills, sexual violence, and society and culture targeted to adolescents in Nigeria based on the national Family Life HIV/AIDS Education (FLHE) curriculum. The intervention uses videos, news services and text messages to support communication. In order to engage adolescents, the intervention is based on cartoon characters depicting adolescents who also serve as the main educators in the intervention. The teaching materials include games, quizzes, exercises and a MyQuestion section where adolescents can send questions about anything that is bothering them to express their anxiety and get accurate information and advice. By the end of the pilot phase of the project that lasted for a year, 9,000 Nigerian adolescents had taken part in the intervention. Preliminary project evaluation showed that the adolescents who participated in the program had increased knowledge and improved skills in sexual and reproductive health, ICT and life skills. The intervention had more impact on girls and in topics where pre-project knowledge was lower, showing 10-20% better results than in control group (Oneworld.net, n.d.). Also qualitative feedback from the users indicated that they benefited from participating in the project. For example, after going through the program, adolescents stated that "LaL has helped me identify my values and behaving according to them", "I feel free now to discuss issues of sexuality"; or "the pictures and the cartoons help me understand better" (Oneworld.net, n.d.).

The project's report prepared by Oneworld.net (n.d.) indicated that the main challenges of the intervention implementation were caused by technical problems. Inconsistencies in the Nigerian power supply, lack of computers, overcrowded classrooms and low speed of internet urged the project developers come up with alternative teaching methods (e.g. paper- or CD-based materials, use of one laptop and projector in class). In addition, due to low IT-skills of teachers, project developers faced the need to organize extra training sessions for them (Oneworld.net, n.d.).

Finally, an HIV/AIDS prevention intervention Sura ya UKIMWI was launched in Tanzania in 2009 targeting secondary school students. It is an interactive digital story-telling platform that includes stories told by adolescents about HIV and AIDS that the target group can identify with and relate to. The intervention developers used participatory approach in order to develop contextually, culturally and socially relevant material including stories, graphics, multimedia, and voices (Duveskog, Bednarik, Kemppainen & Sutinen, 2009). Altogether five
stories were developed, each one of them branches into different directions depending on the users' choices in various situations. By seeing and hearing the stories, students can imagine themselves in it and can reflect on the situation and its solutions. The educators can use the program materials to stimulate discussion and encourage sharing of experiences (Duveskog et al., 2009). Information on the results of *Sura ya UKIMWI* are not available yet, but studies during pilot testing showed that the stories included in the intervention were easily understood by the students and they could relate to the material. The adolescents found the stories to be captivating, entertaining and engaging and they stimulated students to ask questions on the covered topics (Duveskog et al., 2009). Similarly to previous case studies, the biggest challenges of the implementation of *Sura ya UKIMWI* were lack of computers and Internet in schools (Duveskog et al., 2009).

There were no studies found regarding computer-based breast self-exams or HPV vaccination interventions from developing countries.

### 2.5. Theoretical Overview

Health behavior is a complex issue and therefore it should be looked at from the systems approach. The ecological perspective assumes that an individual's behavior is part of a larger system, being influenced by a complex web of factors like individual factors, socio-cultural and group factors, socio-economic factors, as well as political and environmental factors (Edberg, 2007). Thus, besides internal factors like personality traits, knowledge, attitudes and motivations, decisions that people make about their health and health related issues is greatly influenced by external contextual factors as social norms, cultural values and physical environment.

Several reviews of health behavior research have shown that theory-based health behavior interventions have been more effective compared to those that do not use theoretical frameworks (Webb, Joseph, Yardley, & Michie, 2010). Systematic reviews suggest that about one third to half of health interventions are based on a theory, however, among online health interventions the proportion of theory-based solutions is even smaller (Dombrowski, Sniehotta, Avenel, & Coyne, 2007; Evers, Prochaska, Driskell, Cummins, Prochaska, & Velicer, 2003).

There is a wide range of theories that attempt to predict behavior change that differ from each other by their structure as well as applicability in explaining certain behaviors, but sexual
health related studies have utilized a relatively small set of these behavioral theories (Noar et al., 2010). Some theoretical frameworks used in sexual health research are very specific, focusing on certain disease. For example, an AIDS Risk Reduction Model (Catania, Kegeles, & Coates, 1990) and Information-Motivation-Behavior Model (Fisher & Fisher, 1992) focus on factors influencing sexual behaviors related to HIV transmission. The more general and often used theories include the theories of reasoned action and planned behavior (Ajzen & Fishbein, 1977), the transtheoretical model (Prochaska & DiClemente, 1982), the social cognitive theory (Bandura, 1986), and the health belief model (Rosenstock, 1974). All these theories assume that an individual's behavior is mediated by changes in mediating factors such as knowledge, attitudes, self-efficacy, perceived social norms, perceived susceptibility and/or intentions (Noar et al., 2010).

The integrative model of behavioral prediction (Fishbein, 2000; Fishbein 2008), which lays the theoretical framework for this study, is the latest integration of the theory of reasoned action, the theory of planned behavior, the social cognitive theory, and the health belief model. By incorporating all the main variables from each of these theories into one reasoned action framework, the integrative model of behavioral prediction (IM) aims to explain the relationship between individuals' motivation and performance of a specific behavior by identifying a certain set of internal and external predictors. Although the IM is a relatively new model, it is grounded on theoretical constructs that have been tested in hundreds of studies. This current study is one of the few attempts to evaluate its applicability and determine its viability in predicting behavioral performance.

2.5.1. The Integrative Model of Behavioral Prediction (IM)

The Integrative Model of Behavioral Prediction (IM) originated from the expectancy-value theory, stating that an individual's attitudes are influenced by his or her belief about the object and subjective values or evaluation of those beliefs (Fishbein, 1963). The theory assumes that although there are an infinite number of factors that may have impact on every behavior, only a small number of variables need to be considered to predict, change, or reinforce a behavior. The theory presents a framework based on the assumption that there are nine critical determinants of every behavior: intention, skills and abilities, environmental factors, attitude, norms, self-efficacy (perceived behavioral control), behavioral beliefs (cost-benefits, outcome
expectancies), normative beliefs and control beliefs (Figure 1). Thus, an individual is likely to perform a behavior if she has a strong intention and necessary skills and abilities to perform the behavior, and there are no environmental barriers that would prevent performing the behavior. Furthermore, individual's intentions are influenced by her attitudes, perceived descriptive and injunctive norms as well as self-efficacy (Fishbein, 2008), and the importance of each component varies across behaviors (Fishbein, 2000). Therefore, changing beliefs underlying the intention to perform a certain behavior ultimately results in changes in intention (Fishbein & Yzer, 2003). The beliefs, in turn, are influenced by several factors such as education, media, interaction with peers or family, and personal experiences.

Figure 1. Integrative Model of Behavioral Prediction (adapted from Fishbein, 2000; Fishbein, 2008).

Behavior and intentions. The central component of the IM is intention, which is the main determinant and immediate antecedent of behavior. In previous literature, intentions are conceptualized as individual's readiness to engage in certain behavior (Fishbein, 2008). Intentions are assumed to involve motivational factors that influence a behavior, affecting how much effort an individual is willing to put in an attempt to perform the behavior (Ajzen, 1991). Therefore, intention to perform or not to perform the behavior is the central determinant to whether an individual actually behaves in a certain way.
Several reviews of previous literature have referred to a strong relationship between intentions and behavior. For instance, in a review of nine meta-analyses focusing on the constructs of the IM, an average correlation of .48 was reported between intention and behavior (Conner & Sparks, 2005).

According to the IM, the individual's intention is influenced by three psychosocial determinants: the attitude toward performing the behavior, amount of normative pressure the individual perceives toward the behavior and individual's perception about her ability and skills to perform the behavior (Fishbein, 2008). Therefore, individuals will have strong intentions to perform a behavior if they evaluate it positively, believe that important others would want them to perform it, and think that it is easy to perform.

Overall, the stronger the intention to perform a behavior, the more likely the individual is going to engage in it. However, this applies only if the behavior is under individual's volitional control (Ajzen, 1991).

**Attitudes.** Attitude is referring to the individual's positive or negative evaluation of performing the future behavior (Ajzen & Fishbein, 2005). An attitude toward behavior is determined by accessible behavioral beliefs about the consequences that performing the behavior has for the individual. Behavioral beliefs reflect the perceived consequences of a behavior which is a similar to the constructs of costs and benefits in the health belief model and outcome expectancies in the social cognitive theory. Behavioral beliefs and their evaluations are predicted to create an overall evaluation or attitude toward performing the behavior. In other words, attitude toward behavior is assumed to be a combination of the perceived likelihood that behaving in a certain way has particular consequences and an evaluation of these consequences in terms of good or bad (Yzer, 2013). Therefore, if the individual's perceived advantages of performing the behavior outweigh his or her perceived disadvantages, the individual is likely to have a favorable attitude toward the behavior (Ajzen & Fishbein, 2005).

Latest developments of the reasoned action model have emphasized the distinction of two aspects of attitudes which could be useful when designing messages for health interventions. Instrumental aspects of attitude refer to the perceived cognitive implications (e.g. usefulness) of certain behavior whereas experiential aspects focus on affective side (e.g. enjoyment) associated with performing the behavior (Fishbein & Ajzen, 2010)
Perceived normative pressure. In addition to attitudes, behavioral intentions are influenced by perceived norms that refer to an individual's perception of social pressure to perform or not to perform the behavior (Ajzen & Fishbein, 2005). The perceived normative pressure is a combination of injunctive normative beliefs which refer to an individual's perception whether certain others think she should perform a behavior, and descriptive normative beliefs referring to a perception whether certain others perform particular behavior themselves, and an individual's motivation to comply with these certain others (Fishbein & Ajzen, 2010). As previous research has indicated that injunctive and descriptive norms can have different effects (Jacobson, Mortenson, & Cialdini, 2011), the impact of these norms in a context of reasoned action approach is not thoroughly studied before (Yzer, 2013).

Previous research has shown that perceived norms have more influence in younger samples and collectivistic populations, and for behaviors that have salient social aspects (Fishbein & Ajzen, 2010). In a perspective of this study, it is hard to make assumptions what role would perceived norms play on predicting young Pakistani females' sexual health and cancer prevention behaviors. As previously discussed, societal approval is significant for any behavior, however, taboos and constraints of talking about these topics could reduce the importance of perceived norms when predicting sexual health and cancer prevention behaviors.

Self-efficacy/perceived behavioral control. Similarly to the social cognitive theory (Bandura, 1986) and the health belief model (Becker, 1974), the IM assumes that an individual's performance of behavior is influenced by self-efficacy, a perceived capability and confidence of successfully performing the advocated behavior. According to Bandura (1977), people avoid situations where their perceived coping skills are exceeded and get involved in activities when they feel that they are capable to handle. Although empirically self-efficacy and perceived behavior control may be distinguished as two separate constructs, theoretically the concepts are "virtually identical", referring to an individual's perception as to whether they can perform advocated behavior (Fishbein & Ajzen, 2010). Therefore these constructs are used simultaneously in this study.

Self-efficacy or perceived behavioral control is predicted by control beliefs which refer to perceived likelihood of occurrence of the factors that facilitate or inhibit performance of the behavior. Thus, the construct of control beliefs aims to explain the barriers or constraints that the individual perceives towards adopting the behavior. The self-efficacy, in turn, is a function of
control beliefs weighted by the perceived power of the particular control factor in impeding or facilitating the behavior\textsuperscript{2}. It is important to emphasize that in the IM, self-efficacy is a different theoretical variable than actual skills and competence (see description of the actual control below), which moderates the effects of intention and behavior.

It is suggested that self-efficacy or the perceived behavioral control is influencing behavior directly as well as through a mediating behavioral intention. In conditions where the individual has complete volitional control or actual behavioral control (Azjen, 1991; Sutton, 1998), the perceived behavioral control should not affect intention-behavior relationship. In contrast, in situations where the behavior is not completely under the individual's volitional control and intention has less predictive power of behavior, perceived behavioral control should be independently predictive of behavior (Ajzen, 1991).

**Actual control.** According to the IM, the relationship between intention and behavior is moderated by actual control that refers to environmental factors, skills and abilities. The IM acknowledges that even when knowledge, supportive beliefs and positive attitudes toward a behavior are present, in some cases an individual is not performing the behavior due to environmental constraints or because of lack of skills or competence (Fishbein, 2008). Previous research has indicated that in such cases the IM variables do poorly when predicting behavior, and reasons for non-performance should be searched elsewhere (Fishbein, Hennessy, Yzer, & Douglas, 2003). Active control is hard to measure as it often includes behavior constraining circumstances and objective factors that individuals may not even be aware of (M. Yzer, personal communication, May 11, 2012). Therefore, active control is the least studied part of the model due to lack of reliable measures for this construct; however, due to environmental constraints discussed previously, it may play a crucial role especially in sexual health and female cancer prevention behaviors in Pakistan that are in focus of this study.

**Background variables.** The IM hypothesizes that there are a number of external demographic, attitudinal, personality, and individual difference variables that may influence behaviors. However, the theory assumes that this influence is indirect and is "coded" in the beliefs structure.

\textsuperscript{2} Some authors have used the term "Efficacy Beliefs" when referring to beliefs that underlie self-efficacy (e.g. Yzer, 2012)
Overall, the predictive power of attitudes, subjective norms and self-efficacy on the intention construct varies across situations and behaviors (Ajzen, 1991). Thus, in situations where other determinants (attitudes or subjective norms) are relatively strong, the perceived behavioral control may have less predictive power for intentions. At the same time, under conditions of very high volitional control, intentions can be the only predictor of behavior.

2.5.2. The Reasoned Action Approach In Safe Sex and Cancer Prevention Research

Meta-analyses have indicated that of the reasoned action approach has relatively high predictive power of behavioral intention as well as behavior when compared to other models used in behavioral sciences. A meta-analysis of 185 studies reported that the attitudes, perceived norms and self-efficacy explained 27% of the variance in behavior and 39% of variance in intention, showing higher predictive power when using self-reporting compared to observations (Armitage & Conner, 2001). In accordance with these findings, another meta-analysis covering nine theory of planned behavior meta-analyses indicated that on average, attitudes, subjective norms and perceived behavioral control account for 34% of the variance in intentions whereas perceived behavioral control and intention explain 26% of variance in actual behavior (Conner & Sparks, 2005).

Condom use. Intentions have been found to be a good predictor of actual behaviors in the field of sexual health. Condom use has been one of the well-studied sexual health behaviors, mostly looked at using the theoretical constructs of the IM. A meta-analysis by Milne, Sheeran & Orbell (1998) found a sample-weighted average correlation of .44 between intentions and condom use across 28 independent samples (N = 2,532). The Sheeran & Taylor (1999) study conducted a meta-analysis to determine the main predictors of the intentions of using a condom. Their study supported the IM, suggesting that attitudes, subjective norms and perceived behavioral control all contribute to the prediction of intentions to use condoms. Attitudes and subjective norms seem to be the most significant antecedents of condom use intentions (Sheeran & Taylor, 1999; Bennett & Bozionelos, 2000).

A meta-analysis conducted by Albarracín, Johnson, Fishbein, & Muellerleile (2001) indicated similar results. They synthesized 96 data sets (N=22,594) and reported that condom use was related to intentions (weighted mean r. = .45) which were based on attitudes (r. = .58),
subjective norms (r. = .39), and perceived behavioral control (r. = .45). Attitudes were related to behavioral beliefs (r. = .56), and norms were associated with normative beliefs (r. = .46).

Delaying the onset of sexual intercourse. Studies have shown that the theoretical constructs of the IM have shown supporting results in predicting individuals delaying their first sexual intercourse. A study by Carvajal et al. (1999) conducted among U.S. 13-18 year old adolescents suggested that students with more positive attitudes, normative beliefs, and higher self-efficacy were less likely to engage in intercourse during the 2-year follow-up period. Being consistent with the IM, these variables predicted the delay of onset better than distal background factors like age or ethnicity. However, attitudes and social norms showed better predictive power compared to self-efficacy (Carvajal et al., 1999).

Another study measured the effectiveness of a sexual health intervention that was based on the theoretical variables of the IM, interpersonal behavior theory and the social cognitive theory and was aimed at high school students in Canada. As a result of the intervention, participants in the experimental group had more positive attitudes, perceived behavioral control, and intention with respect to postponing sexual intercourse, suggesting that theory-based interventions are effective in modifying determinants related to postponing sexual intercourse (Caron, Godin, Otis, & Lambert, 2004).

Breast self-exams. Besides safe sex behaviors, the theoretical constructs of the IM have been used to predict women's cancer prevention behaviors, such as breast self-examination and HPV vaccination, and generally the studies have found support for the framework. A study among the U.S. college students showed that attitudes, subjective norms and perceived behavioral control predicted intentions to perform breast self-exams (r. = .48) as well as testicular self-exams (r. = .82) (McCaul, Sandgren, O'Neil, & Hinsz, 1993). Similar results were found by Norman & Hoyle (2006) who studied breast self-exams among female employees of a company in the United Kingdom. They found that the attitudes, perceived norms and separate constructs of self-efficacy and perceived behavioral control explained 72% of variance in intention to perform breast self-exam. Norman & Hoyle (2004) also reported that intention was the sole predictor of self breast-examinations in long-term, as has been found in previous studies.

HPV vaccination. Constructs of the IM have also been beneficial when predicting the acceptability of the vaccine for HPV. Gerend & Shepherd (2012) tested the constructs of the theory of planned behavior and the health belief model when predicting HPV vaccine uptake and
found that key predictors of vaccine uptake were subjective norms, self-efficacy, and vaccine cost. Another study was conducted among 13-26 year old females and the results indicated that higher HPV knowledge and subjective norms were among other factors that influenced individual's intention to receive the HPV vaccine (Kahn, Rosenthal, Jin, Hyang, Namakydoust, & Zimet, 2008).

A study conducted among parents of 8-18 year old children in Canada reported that the strongest predictor of parental intention to vaccinate their children for HPV were attitudes toward vaccines in general as well as toward HPV vaccine. In addition, recommendations from health care providers were an important predictor of intention. However, cultural and religious factors did not influence parental intention to vaccinate (Ogilvie et al., 2007).

### 2.5.3 Previous Utilization of the IM

The IM not only provides a conceptual framework to understand and predict an individual’s behavior, but it can also be used as a theoretical basis for designing effective behavior intervention or promotion by providing information about which determinants should be addressed with the intervention.

The theoretical constructs of the IM have been successfully used for designing internet-based health interventions. Online health interventions that have been based on the reasoned action approach have shown significantly larger effects on behavior compared to those that have used other theoretical frameworks (Webb et al., 2010).

Based on the cognitive foundation, the strength of the IM is that it provides a conceptual framework to understand the determinants of human social behavior, and presents a quantitative measurement of the intention-behavior relationship. Several meta-analysis and reviews of studies using the theoretical variables of the IM have provided a useful framework for predicting a wide range of health behaviors and behavioral intentions (Armitage & Conner, 2001; Hausenblas, Carron, & Mack, 1997; Albarracin, Johnson, Fishbein, & Muellerleile, 2001). The theoretical variables included in the IM have been widely used in studying sexual behaviors (Bleakley, Hennessy, Fishbein, & Jordan, 2011; Hennessy et al., 2010; Hull, Hennessy, Bleakley, Fishbein, & Jordan, 2011), smoking cessation (Fishbein & Cappella, 2006; Godin, Valois, Lepage, & Desharnais, 1992; Hanson, 1997; Higgins & Conner, 2003), healthy dieting (Povey, Conner, Sparks, James, & Shepherd, 2000; Sjoberg, Kim, & Reicks, 2004), alcohol abuse (Marcoux &
Shope, 1997; Huchting, Lac, & LaBrie, 2008), breast feeding (Giles, Connor, McClenahan, Mallett, Stewart-Knox, & Wright, 2007; Wambach, 1997), health workers’ glove use (Levin, 1999), weight reduction and exercise (Schifter & Ajzen, 1985), organ donor (Bresnahan, et al., 2007), and cancer prevention behaviors (Gerend & Shepherd, 2012; Smith-McLallen & Fishbein, 2008).

The reasoned action approach provides useful information about the determinants that affect health behaviors. Based on the framework, interventions can be designed that are customized to the targeted populations or even tailored to individuals. Overall recent meta-analyses have indicated that customized health messages are more likely to be read, understood, and remembered, perceived as credible, viewed as personally relevant by generating more personal connections to the materials and may also be more cost-effective (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008; Noar, Benac, & Harris, 2007; Lustria, Cortese, Noar, & Glueckauf, 2009).

However, tailored solutions are often not accessible due to high cost, especially in low resource settings. Furthermore, there are no studies available indicating that tailored message strategy would work better than targeted one. Therefore, this study uses a targeted or group-tailored approach which allows us to take into account the demographic characteristics shared by the subgroup's members as well as salient behavioral, normative and control beliefs that are most common among the targeted subgroup. The customization techniques applied in this study are discussed in the methodology section.

2.5.4. Criticisms of the IM

Ajzen (1991) has stated that additional variables can be added in the reasoned action framework to improve its predictive power. For example, Norman, Conner, & Bell (2000) have stated that the theoretical framework does not take into account individual's risk perceptions which are a central construct in other health behavior theories as the health belief model. Therefore, a perceived susceptibility should be added in the theory in order to understand better individual's motivation to perform or not to perform a behavior. However, some studies have shown that adding perceived susceptibility in the model have not improved the data-model fit (Levin, 1999).
Some researchers have also claimed that past experience should be part of the model as it is often one of the strongest predictors of future behavior (Norman, Conner, & Bell, 2000). However, according to the IM, the construct of perceived behavioral control already comprises previous experience because among other factors, individual's past experience with the behavior is assumed to influence control beliefs (Ajzen, 1991).

Some researchers have pointed out that it is hard to tell a difference between intentions and expectations. In particular, Warshaw & Davis (1985) have provided clarifying definitions for each construct, stating that behavioral expectation is the individual's estimation of the likelihood that he or she will actually perform the behavior whereas behavioral intention is the degree to which person has formulated conscious plans to perform or not perform the behavior (Hausenblas et al., 1997). However, as several meta-analyses have failed to identify the difference between intentions and expectations, this study will consider them as one construct.

Finally, some researchers have suggested that health behavior research does not pay enough attention to cultural factors such as traditions, societal norms, shared beliefs and values, and religious beliefs, and structural factors such as legal, political, economic and organizational elements in the society that all influence health behaviors and vary across subgroups of population (Cockerham, 1997; Dressler & Oths, 1997). Furthermore, researchers have questioned the general applicability of cognitive behavioral models as the TPB in health behavior research conducted in different cultures (Eaton, Fisher, & Aarø, 2003). This criticism is crucial in a context of this study as the situation analysis and literature review showed that both abovementioned factors greatly influence sexual health and cancer prevention behaviors of Pakistani young females.

However, according to the authors of the theory, it is sufficient and does not rule out other causes of behavior as cultural, personal or situational factors. Indeed, there is an infinite number of variables that influence performance or nonperformance of any behavior but according to the theory, only a small number of them which are all the constructs of this theory, need to me measured in order to predict, understand, reinforce or change behavior (Fishbein, 2008). Ajzen & Fishbein (2005) claim that all additional factors, including for example socio-demographic factors, religious beliefs, and knowledge are assumed to influence intention through their effects on attitudes, subjective norms and perceived behavioral control. Although the same variables (attitude, subjective norms, and perceived behavioral control) determine
behavioral intention, the behavior itself can be unique as the factors that influence beliefs are
different in every population. This statement is supported by empirical findings as the theoretical
variables in IM model have been successfully applied in predicting behaviors in non-Western
contexts (Aarø et al., 2006; Fishbein, 2000).

Other possible modifications included the addition of personal norms that have been
operationalized as self-identity or moral norms; however, further research is needed to test the
adequacy of additional variables by testing them against measures of perceived norms (Armitage
& Conner, 2001).

2.6. Hypotheses and Research Questions

Based on the literature review, the study will focus on three behaviors related to sexual
health and cancer prevention in women that are relevant in a population of young Pakistani
females: breast self-examinations, regular condom use during vaginal sex, and HPV vaccination.
Altogether five hypotheses and two research questions are examined in this study.

Hypotheses

Impact of intervention

Intention

H1: Exposure to a targeted health information website will result in higher intention to perform
studied behaviors. Therefore, compared to the control group, participants in the experimental
group have:

(a) higher intention rate to get HPV vaccination once in the next two months;
(b) higher intention rate to always use condoms when having vaginal sex;
(c) higher intention rate to perform monthly breast self-examinations in the next two months.

Partial validation of the IM

Attitudes-intentions relationship

H2: More positive attitudes toward a health behavior lead to higher intention to perform the
behavior, therefore:
(a) More positive attitudes toward HPV vaccination lead to higher intentions to get vaccinated for HPV;
(b) More positive attitudes toward regular condom use during vaginal intercourse lead to a higher intentions to use a condom regularly when having vaginal sex;
(c) More positive attitudes toward monthly breast self-exams lead to a higher intentions to perform monthly breast-exams.

*Perceived normative pressure-intentions relationship*

H3: Stronger perceived social pressure to perform a health behavior lead to higher intentions to perform that health behavior. Therefore,
(a) Stronger perceived normative pressure to vaccinate for HPV lead to higher intentions to get vaccinated for HPV;
(b) Stronger perceived normative pressure to regularly use a condom during vaginal intercourse lead to higher intentions to use a condom regularly when having vaginal sex;
(c) Stronger perceived normative pressure to perform monthly breast self-exams lead to a person's higher intentions to perform monthly breast-exams.

*Perceived behavioral control-intentions relationship*

H4: Higher levels of self-efficacy to perform a health behavior lead to higher intentions to perform that health behavior. Therefore,
(a) Higher perceived behavioral control to vaccinate for HPV lead to higher intentions to get vaccinated for HPV;
(b) Higher perceived behavioral control to regularly use a condom during vaginal intercourse lead to higher intentions to use a condom regularly when having vaginal sex;
(c) Higher perceived behavioral control to perform monthly breast self-exams lead to a higher intentions to perform monthly breast-exams.
Research Questions

**RQ1:** According to the IM, intention is a function of attitudes, perceived norms, and perceived behavioral control. How well do these three variables explain the variance in intention for each studied behavior?

**RQ2:** What impact did the health website have on attitudes, perceived normative pressure and perceived behavioral control?
CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1. Study Design

The study used randomized experiment post-test only equivalent groups design with one treatment group and one control group, allowing the measurement of the overall effectiveness of the website when comparing post-test results between the groups.

Some researchers (e.g., Kippax, 2003) have questioned the suitability of experimental evaluation when measuring sexual health interventions mostly due to difficulties with isolating the control group from the intervention group. The spill-over of the intervention from the treatment group into the control group was minimized by restricting access to the educational intervention website via individual codes, only provided to those who were randomly assigned to the treatment group. Post-test only equivalent groups design was suitable for this experiment as this design did not risk the sensitization threat that designs with pre-test may have (Frey, Botan & Kreps, 2000).

This study used self-reported data. The questionnaires were administered online by using a web-based self-administered survey technique. Participants in both groups were asked to fill out identical surveys. The instrument was pretested for clarity on Pakistani college-aged female student volunteers and their suggestions were taken into account in the final versions of the questionnaires.

Researchers (e.g., Bates & Cox, 2008) have found several advantages to collecting data through computer-administered questionnaires, including anonymity and confidentiality which are essential when asking individuals about sensitive topics especially in conservative societies. In addition, when using computer-based measurement techniques compared to paper-based surveys, the social desirability bias is less likely to occur (Richman, Kiesler, Weisband, & Drasgow, 1999) and individuals are more likely to report risky sexual behaviors (Turner, Ku, Rogers, Lindberg, Pleck, & Sonenstein, 1998).
3.2. Sampling

This study used known group sampling (Reinard, 2001) to target specifically female college students. Although the results of a study with nonrandom sampling are not generalizable, they give an indication, how the IM model works among that specific population.

Sample size is a critical factor when conducting path analysis as small samples may result in inaccurate statistical estimates. According to Jackson (2003), the minimum sample size can be calculated when as a ratio of cases and model parameters is 20:1, however, Bentler & Chou (1987) have suggested that the ratio of sample size to number of free parameters may be as low as 5:1. Therefore, in order to test the whole IM model, the sample size should be minimum of 180 participants.

3.3. Recruitment of Participants

The prospective participants were approached on the campuses of four universities in Lahore and Karachi. The selection criteria included students who were females, at least 18 year old, students of these universities, were able to use the internet, and had an e-mail account.

To reduce language and cultural barriers, the recruitment was conducted by a local female research assistant who was in the same age group as the targeted college students. Previous research has shown that experiential similarities have increased participants' trust and perception that the researcher is less judgmental, as she is more likely to understand cultural values and norms (Elam & Fenton, 2003). The research assistant was instructed not to recruit participants who she is acquainted with. Also, it was ensured that participants know that the recruiter has no access to the information collected, nor serve as moderator within the experiment itself.

The potential participants were asked to take part in a health study. After introducing the research, an e-mail address was asked for from potential participants. According to local consultants, it was suggested that monetary incentive should be given to participants in order to increase the likelihood of participation. Therefore, when introducing the study, the recruiter
advertised that 100 Pakistani Rupees worth of prepaid phone card credit (which provides about 100 minutes of talk time) was offered at the completion of the questionnaires.

3.4. Procedures

Exploratory stage. The exploratory stage of this study (Figure 2) started with elicitation research to identify salient beliefs and referents that underlie three sexual health and cancer prevention behaviors, and prospective research to examine the intentions to perform these behaviors as a function of attitudes, perceived normative pressure, perceived behavioral control and their underpinnings (experiment stage).

The research process of this study was based on the recommendations by Fishbein & Ajzen (2010). In order to identify the primary beliefs among the studied population about three targeted behaviors, a structured qualitative pilot study (Appendix D) was conducted in a convenience sample of twelve young Pakistani college females. This data was content analyzed, and the beliefs most often stated were used to create the quantitative questionnaire, which, besides belief measures, also assessed attitudes, perceived norms and perceived behavioral control, as well as intentions (see Appendices E and F). The questionnaire was pilot-tested among 20 Pakistani college females.

Experiment stage. Once the e-mail addresses from potential participants were gathered, they were be randomly assigned into treatment and control group using the Excel \textit{randbetween} function. In order to reduce the likelihood of respondent fatigue and loss of interest, the experiment group's survey questionnaire was divided into two parts where the first part was administered before the intervention and the second part after the intervention. The first part of the survey questionnaire focused on the demographical data and the second part on studied IM constructs.

Participants assigned to the treatment group were sent an e-mail with a link to the first part of the survey and a unique code. The last question of the survey directed them to the intervention website's welcome page. After the participants had read the website materials, they were asked to click on a link on the website that directed them to the second part of the survey. In order to avoid duplicate participation by one individual and make sure that the same
participant took both parts of the survey, the respondents were asked to insert a unique code in the beginning of each part. Similarly, participants in the control group received an e-mail with a unique code and a link to control group's questionnaire.

![Study procedures diagram](image)

*Figure 2. Study procedures*

Appropriate consent procedures and clear explanations about the study were provided before the participants could access the questionnaires. Before the participants in each group were exposed to the questionnaires, they were asked to fill out an informed consent form approved by the Florida State University Human Subjects Committee. The requirements of the FSU Human Subjects Committee were taken as a guide when preparing the consent forms and gathering data and it was repeatedly emphasized that the anonymity of the participants as well as confidentiality of their answers would be guaranteed. In addition, a personal statement by the researcher was added to the consent form that explained in an informal way what the goals and
the value of the study are. Within this statement, it was also stated that the study is independent and not related to any news organizations, Pakistan governmental institutions, or nongovernmental organizations.

After finishing the questionnaires, participants in both groups received mobile phone credit codes by e-mail within two weeks after they had filled out the questionnaire.

**3.5. Description of the Intervention**

For this study, an educational health intervention GirlTalk (www.girltalkglobal.com) was developed. A limited version of the website was used as treatment in order to make the participants focus more on the topics that were examined in this study. The website covered topics that, based on a literature review, were defined as critical health problems among young Pakistani females: lack of female cancer prevention behaviors, low level of safe sex and family planning behaviors, and lack of communication on sexual health topics. The screenshots of the website used in this study can be seen in Appendix B.

The website was targeted to young Pakistani females using culturally relevant information and examples. The information on the website used as a treatment in this study was customized in accordance with the needs and characteristics of young females in Pakistan.

When developing the website, several strategies for creating culturally sensitive health materials were followed. Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson (2003) emphasized that culturally sensitive materials should use peripheral strategies to give the health materials the appearance of cultural appropriateness. On the GirlTalk website, the illustrations used on the page were customized for the targeted audience based on age and ethnic characteristics.

Secondly, it is recommended to increase the perceived relevance of the communicated health topic by using evidence relevant to the targeted group (Kreuter et al., 2003). On the intervention website, the provided information was based on local context, for instance, the presented facts about the prevalence of certain sexually transmitted infections used Pakistan-based examples.

Kreuter et al. (2003) also suggested that linguistic strategies by providing information in a dominant or native language of the target group will make health materials more accessible.
When developing the website GirlTalk, the recommendations of the representatives of the target population were followed and the website was created only in English, which is the dominant learning language among young Pakistani college females who participated in the study.

Finally, when developing culturally sensitive health websites, it is important to follow socio-cultural strategies which mean that health topic should be discussed in the context of broader values of the targeted audience (Kreuter et al., 2003). In order to prevent possible objections against the website, the topics covered on the webpage avoided religious and political discourse. In addition, the illustrations used on the website were tested among the representatives of the targeted population in order to find illustrations that would not be perceived as offensive or inappropriate.

Several studies (e.g. Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008) have indicated that personalized feedback leads to higher user involvement, satisfaction and lower dropout rates. On the website, the users are provided with an opportunity to get asynchronous individualized feedback from a doctor when they submitted their sexual health or female cancer related questions through an online form.

### 3.6. Measures

The IM focuses mainly on the factors that influence intention formation as well as the relationship between intentions and actually performing the behavior. However, previous research has recommended that when using reasoned action approach as an evaluation tool for health interventions, in addition to intentions and behaviors the direct attitudinal and indirect belief-based indicators should also be measured in order to understand what determined the occurrence or nonoccurrence of behavior change (Witte & Allen, 2000; Fishbein, 2008; Fishbein & Ajzen, 2010).

An important component when applying the IM for intervention evaluation is the principle of compatibility, suggesting that the prediction improves when predictive variables and predicted behavior have the same specificity (Fishbein & Ajzen, 2010). As the precision of behavior prediction improves when specific rather than general behavioral categories are measured, this study uses the behavior defining matrix, which specifies four different elements for each behavior: the *action* performed, the *target* at which the action is directed, the *context* in
which it is performed, and the *time* at which it is performed (Ajzen & Fishbein, 1977; Fishbein & Ajzen, 2010). As for some of the behaviors the interest of this study was to find out only whether the particular behavior was carried out or not, as opposed to focusing on a specific time frame or place, such behaviors are defined at more general level.

### Table 1.

**Behavior defining matrix (adopted from Fishbein & Ajzen, 2010)**

<table>
<thead>
<tr>
<th>Definitional component</th>
<th>Action</th>
<th>Target</th>
<th>Context</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior 1</td>
<td>Performing</td>
<td>Breast self-examination</td>
<td>Unspecified</td>
<td>Monthly during next 2 months</td>
</tr>
<tr>
<td>Behavior 2</td>
<td>Using</td>
<td>Condom</td>
<td>When having vaginal sex</td>
<td>Always</td>
</tr>
<tr>
<td>Behavior 3</td>
<td>HPV vaccination</td>
<td>HPV vaccine</td>
<td>Health care provider</td>
<td>Once during the next 2 months</td>
</tr>
</tbody>
</table>

Although there is a list of sample scale items that could be used in the context of any behavior, some data have suggested that these items may not be appropriate for every study and may result in low internal consistency of the scale (Valois & Godin, 1991). Therefore, whenever applicable, this study uses scales that have been tested previously in a similar behavioral context and shown sufficient internal consistency (α larger than .70) indicating relatively small measurement error. If suitable scales were not found from previous literature, the measurements were developed based on suggestions by Fishbein & Ajzen (2010).

When measuring psychological constructs, the use of single-item measures is discouraged because of low reliability of such measures (Wanous, Reichers, & Hudy, 1997). Therefore, in this study, multiple-item instruments were preferred.

### 3.6.1. Eliciting salient beliefs

For the qualitative formative research conducted prior to the development of the survey questionnaire, salient behavioral beliefs, injunctive and descriptive normative referents, and control factors for each outcome behavior were identified in the target population. By using content analysis, most often mentioned outcomes, referents, barriers and facilitators were used in
the main questionnaire of the study. The qualitative questionnaire included questions about perceived advantages and disadvantages of performing each studied behavior, four questions about referent groups would approve or disapprove performing studied health behaviors, as well as two questions about perceived factors that facilitate or impede performing each specific behavior. Similarly to Agnew (1998), a belief was considered to be salient if it was mentioned by at least 20% of the overall pilot sample. These most often mentioned answers in each category were formed into questions and added to the quantitative questionnaire.

3.6.2. Predictor Variables of the IM

Predictor variables include nine IM constructs: indirect measures: (a) behavioral beliefs and outcome evaluations, (b) normative beliefs and motivation to comply, (c) control beliefs and perceived power, and direct measures: (d) attitudes, (e) perceived norms, and (f) self-efficacy.

(a) Behavioral beliefs and outcome evaluations

Salient behavioral outcome beliefs about each studied behavior was evaluated on a 7-point semantic differential scale with -3 (extremely), -2 (quite), -1 (slightly), 0 (neither), +1 (slightly), +2 (quite), and +3 (extremely) and the endpoints from unlikely to likely.

Although a 7-point semantic differential scale with the endpoints from unlikely to likely is one of the most common scales when measuring outcome evaluations, several researchers have suggested that for certain attributes, there appears to be no advantage to use a bipolar scale as it is obvious for everyone that the attribute is either good or bad (Fishbein & Ajzen, 2010). Therefore, outcome evaluations in this study were measured with a 4-point unipolar scale with the endpoints not at all bad (0) to extremely bad (-3), and one item with the endpoints not at all good (0) to extremely good (+3).

The strength and outcome evaluation for each belief was multiplied and summed which results in a total index of modal behavioral beliefs by using an equation $A \propto \sum b_i e_i$, referring to the overall attitude toward the studied behavior.

(b) Normative beliefs, motivation to comply, and identification with referents

Although several previous studies (e.g. Smith-McLallen & Fishbein, 2008) have used only direct measures of descriptive and injunctive norms (using phrases "People most important
(c) Control Beliefs and Power of Control Factors

In order to receive information about the determinants of target population's perceived behavioral control, accessible beliefs were elicited about factors that facilitate or impede condom use, breast self-exam performance, and getting HPV vaccine. During the exploratory stage of the study, the most common salient control beliefs among the target population were evaluated in terms of their strength referring to the likelihood of the control factor to be present, and the power of control factor indicating whether the factor impedes or facilitates performance of the behavior.

By following suggestions by Fishbein & Ajzen (2010), in the next stage, the strength of four to five most common control beliefs and the power of control factor were measured by 7-
point scale with endpoints 1 (disagree) and 7 (agree). The indirect control belief index was calculated by summing the products of strength and power ratings.

(d) Attitudes
The measure for attitudes included items for instrumental as well as experiential aspects of attitudes. Ajzen and Fishbein (1977) define attitudes as an individual's evaluation of a subject, such as a behavior, a policy, an object or another person. They suggest that in order to understand the subject's location in a bipolar affective or evaluative dimension, the attitudes should be measured by using the semantic differential method proposed by Osgood et al. (1957), evaluating each studied behavior on a set of bipolar scales (Valois & Godin, 1991).

In this study, for each behavior, a statement concerning the specific behavior was followed by 8-item 7-point semantic differential scales with endpoints unpleasant-pleasant, foolish-wise, bad-good, harmful-beneficial, unnecessary-necessary, and difficult-easy. In addition, additional categories immoral-moral and useful-useless were added to capture the socio-religious impact on attitudes and to assess perceived instrumental value of each behavior. Both additional items had been previously used in a scale when studying condom use among students in developing countries (Wilson, Zenda, McMaster, & Lavelle, 1992). The items for measuring attitudes toward each behavior were averaged to create an attitude scale.

(e) Perceived normative pressure
Perceived normative pressure was the mean of two 7-point scales anchored with disagree (-3) and agree (+3). The injunctive aspect of perceived norm was assessed by an item "Most people who are important to me think I should (perform the behavior) in the next two months". The descriptive aspects of perceived norms toward all behaviors were measured by an item "Most people like me will (perform the behavior) in the next 2 months". For behaviors using condom use, time period was not specified. The scale has been previously tested by Hull, Hennessy, Bleakley, Fishbein, and Jordan (2011) when studying adolescent sexual behavior.

(f) Perceived behavioral control/Self-efficacy
As previous research has indicated (e.g. Yzer, 2012), the direct measure for the perceived behavioral control/self-efficacy should include measures for perceived capacity (individual's
confidence to perform a behavior) as well as perceived autonomy (perception to what extent the behavioral performance is under individual's volition). Therefore, the variable was measured by averaging responses to two 7-point items: “My (performing behavior) in the next 2 months would be...” not up to me (-3)/up to me (+3), and “If I really wanted to, I could (perform behavior) in the next 2 months” with scale's endpoints disagree (-3) and agree (+3). For the condom use behavior, time period was not specified. The scale has been previously used by Smith-McLallen, Fishbein, & Hornik (2011) when predicting cancer patients’ intentions to seek information about their cancer from sources other than their physician.

3.6.3. Predicted Variables in the IM

Intention

Intention to perform studied behaviors was measured by a modified version of an intentions scale suggested by Fishbein & Ajzen (2010). For each behavior, intention was measured with the average of three items: "I am willing to (perform behavior) over the next two months"; "I intend to (perform behavior) over the next two months"; and "I will (perform behavior) over the next two months". For a behavior regarding using a condom, time period was not specified. Each response was coded on a 7-point scale from -3 (extremely unlikely) to +3 (extremely likely). The scale has previously been used in the Annenberg Sex and Media Study. Based on this dataset, Hennessy, Bleakley, & Fishbein (2012) tested the scale when studying adolescents' intentions to have vaginal sex, showing the alpha of .96 for the summed items. Similarly, Hull, Hennessy, Bleakley, Fishbein, and Jordan (2011) used the dataset to study relationships between religiosity and sexual debut, and indicated alpha of .89. A slightly modified version of this scale has also been tested by Agnew (1998) with alpha of .98.

3.6.4. Background Factors

As previously discussed, the IM model is considered to be sufficient to predict behaviors without background variables and thus it would be wrong to use background variables when analyzing data sets based on the IM theoretical axioms (Hennessy et al., 2010). Therefore, for descriptive purposes only, respondents were asked to provide their demographic information, including age, gender, ethnicity, income, residence, education level and sexual orientation. In
addition, importance of religion in everyday life, perceived knowledge about studied behaviors and past behaviors were assessed.

3.7. Statistical Analysis

The statistical analysis of this study had two stages. As according to the IM, intentions are the main determinant of behavior, and treatment effect was estimated with regression analysis by comparing the intentions of the treatment and experiment group members to perform studied health behaviors.

This study used path analysis as the second and main method for data analysis. Path analysis allows estimating a set of regression equations simultaneously. Thus, once the difference between two groups was tested, path analysis was used for examining causal relationships between the variables. As a subset of SEM, path analysis is suitable for conducting mediation analysis and identifying the direct and indirect effects of each variable in the model. A path analysis was preferred over regression analysis because it separates direct effects and indirect effects through a mediating variable while regression analysis takes into account only direct effects (Ahn, 2002). In addition, this causal modeling technique has been found to be a suitable method for testing well-specified theories about the relationships between constructs (Lleras, 2005), which the integrated theory of behavior prediction undoubtedly is.

Due to the limited sample size, the whole IM model could not be tested with these data and only direct measures were added in the model. In this path analysis direct paths were specified from the exogenous group variable to endogenous variables attitudes, perceived normative pressure (PNP) and perceived behavioral control (PBC) and from the latter three to intention. Figure 3 presents the generic path analysis model for each behavior. All hypothesized causalities in this model were unidirectional, therefore maximum likelihood estimation was used to parameter estimation.

For comparing the obtained data with a hypothetical research model and for testing the closeness of these models, it is recommended to use several goodness-of-fit indices simultaneously (Kline, 2011). In this study, Chi-square test of model fit, and fit indices of RMSEA with a cut-off value <.08, SRMR with a cut-off value <.08, CFI/TLI with a cut-off
value >.90 were used to test the closeness of data with the hypothetical model (Hu & Bentler, 1999).

A software Stata 8.0 (StataCorp., 2011) was used for performing data analysis in this study.

Figure 3. Path analysis of the proposed research model
Notes: PNP refers to Perceived Normative Pressure and PBC refers to Perceived Behavioral Control
CHAPTER 4

RESULTS

4.1. Sample Description

During the four months when the data for this study was collected, a total of 425 college females signed up for the study and they were sent instructions with the links to the questionnaires. Of 131 students who accessed the survey after receiving the instructions by e-mail, a total of 121 completed the entire survey. Thus, the abandon rate for this study was 7.63% and response rate was 28.47%. One respondent was removed before data analyses because she indicated that she was not a student. In order to confirm that all the participants in the experiment condition had visited the website a manipulation check was administered asking for a selection of topics covered in the study manipulation, only respondents who had correctly selected at least two out of three topics covered on the website, were included in the final analysis. Three respondents were removed because of failure to pass this manipulation check.

In conclusion, the responses of 118 female students were utilized in data analyses, 66 in the treatment group and 52 in the control group. The main socio-demographic characteristics, reported health behaviors, self-perceived knowledge about three studied behaviors, and current use of new communication technologies are presented in Tables 2-5.

According to website traffic tracking service Google Analytics, during the data collection period, the average visit duration on the GirlTalkGlobal website by the users from Pakistan was 7:28 minutes. On average, the participants viewed 3.76 pages during their visit.

4.1.1. Socio-demographic Characteristics

The mean age of the respondents was 20.47 years ($SD = 1.48$), ranging from 18 to 25 years. Almost all participants were single (99.2%), and only one respondent stated that she lived with an intimate partner. The two most prevalent ethnicities that the participants identified themselves with were Punjabi (39.8%) followed by Muhajir (27.1%), smaller percentages of
females identified themselves as Other (16.1%), Sindhi (8.5%), Pashtun (5.9%), or Seraiki (2.5%).

Most of the participants (86.5%) reported that their monthly household income exceeds 50,000 Pakistani rupees. At the same time, 81.4% of the participants were not working and out of the remaining 18.6%, most were employed part-time (17.8%), and only 0.8% reported having a full-time job. A great majority of participants reported living with their parents (89.0%), the remaining ones either shared a room at their university dormitory (8.5%) or lived there alone (0.8%); similarly, 0.8% of respondents reported living with an intimate partner or alone.

The majority of the females identified their sexual orientation as heterosexual (93.2%), the remaining respondents reported themselves as either bisexual (4.2%) or homosexual (2.5%).

Of a total sample, 96.6% of respondents were undergraduate students, only 2.5% stated being master's students and 0.8% being doctoral students. Among respondents, the most popular majors in school were Business, Finance, Economics or Accounting (32.2%), followed by Communication, Marketing, or Journalism (25.4%), and Psychology (10.2%).

A vast majority of respondents (96.6%) associated themselves the most with Islam and the same percentage of participants stated that religion was extremely important, quite important or slightly important in their lives. However, only 34.7% of females reported that they attend religious services regularly, about half (51.7%) of participants stated that they attend religious services occasionally. As stated in Table 2, a total of 13.6% of participants never attend religious services and for 1.6% of students religion is slightly or quite unimportant in their lives.

Finally, of all participants, 7.6% had lived outside of Pakistan for more than a year in last ten years.
Table 2.

Demographic characteristics of sample respondents

<table>
<thead>
<tr>
<th>Characteristic (n = 118)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punjabi</td>
<td>47</td>
<td>39.8%</td>
</tr>
<tr>
<td>Muhajir</td>
<td>32</td>
<td>27.7%</td>
</tr>
<tr>
<td>Sindhi</td>
<td>10</td>
<td>8.5%</td>
</tr>
<tr>
<td>Pashtun</td>
<td>7</td>
<td>5.9%</td>
</tr>
<tr>
<td>Seraiki</td>
<td>3</td>
<td>2.5%</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
<td>16.1%</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not employed</td>
<td>96</td>
<td>81.4%</td>
</tr>
<tr>
<td>Employed part time</td>
<td>21</td>
<td>17.8%</td>
</tr>
<tr>
<td>Employed full time</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 200,000 Rs</td>
<td>31</td>
<td>26.3%</td>
</tr>
<tr>
<td>100,000-199,999 Rs</td>
<td>46</td>
<td>39.0%</td>
</tr>
<tr>
<td>50,000-99,999 Rs</td>
<td>25</td>
<td>21.2%</td>
</tr>
<tr>
<td>30,000-49,999 Rs</td>
<td>5</td>
<td>4.2%</td>
</tr>
<tr>
<td>10,000-29,999 Rs</td>
<td>3</td>
<td>2.5%</td>
</tr>
<tr>
<td>Less than 10,000 Rs</td>
<td>8</td>
<td>6.7%</td>
</tr>
<tr>
<td><strong>Living space</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I live with my parents</td>
<td>105</td>
<td>89.0%</td>
</tr>
<tr>
<td>I share a room in a university dorm</td>
<td>10</td>
<td>8.5%</td>
</tr>
<tr>
<td>I live alone in a university dorm</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td>I live with my boyfriend</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td>I live alone in an apartment/house</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td><strong>Sexual orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>110</td>
<td>93.2%</td>
</tr>
<tr>
<td>Bisexual</td>
<td>5</td>
<td>4.2%</td>
</tr>
<tr>
<td>Homosexual</td>
<td>3</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Attendance of religious services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regularly</td>
<td>41</td>
<td>34.7%</td>
</tr>
<tr>
<td>Occasionally</td>
<td>61</td>
<td>51.7%</td>
</tr>
<tr>
<td>Never</td>
<td>16</td>
<td>13.6%</td>
</tr>
<tr>
<td><strong>Importance of religion in life</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely Important</td>
<td>59</td>
<td>50.0%</td>
</tr>
<tr>
<td>Quite Important</td>
<td>47</td>
<td>39.8%</td>
</tr>
<tr>
<td>Slightly Important</td>
<td>8</td>
<td>6.8%</td>
</tr>
<tr>
<td>Neither Important nor Unimportant</td>
<td>2</td>
<td>1.7%</td>
</tr>
<tr>
<td>Slightly Unimportant</td>
<td>1</td>
<td>0.8%</td>
</tr>
<tr>
<td>Quite Unimportant</td>
<td>1</td>
<td>0.8%</td>
</tr>
</tbody>
</table>
Table 2 - continued

<table>
<thead>
<tr>
<th>Characteristic (n = 118)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>15</td>
<td>12.7%</td>
</tr>
<tr>
<td>19</td>
<td>15</td>
<td>12.7%</td>
</tr>
<tr>
<td>20</td>
<td>23</td>
<td>19.5%</td>
</tr>
<tr>
<td>21</td>
<td>42</td>
<td>35.6%</td>
</tr>
<tr>
<td>22</td>
<td>14</td>
<td>11.9%</td>
</tr>
<tr>
<td>23</td>
<td>6</td>
<td>5.1%</td>
</tr>
<tr>
<td>&gt;23</td>
<td>3</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

4.1.2. Health Behaviors

A great majority (88.1%) of participants reported that they had never had sex, less than one tenth (9.3%) stated having one partner, and only 2.4% indicated they had had three or more partners.

As for preventive behaviors, a total of 71.2% of respondents stated they had never been checked by a gynecologist, the rest of the 28.8% had visited a gynecologist once every five years (11.0%), once every three years (7.6%), once every two years (2.5%) or at least once a year (7.6%). At the same time, only 2.9% of respondents had ever had a PAP-test and 0.8% had ever been diagnosed with a sexually transmitted infection.

As is seen in Table 3, out of the studied three behaviors, the percentage for performing these behaviors in the past was highest for breast self-exams. A total of 42.4% of respondents reported having performed breast self-exams in the past; out of those, 11.9% stated doing it once a year, 14.4% three to four times a year and 7.6% with recommended frequency (once a month). Surprisingly, 8.5% of participants stated performing breast self-exams twice a month or more often. However, only 11.9% of females had ever had their breasts checked by a medical professional.

Out of sexually active participants, 38.5% of females had ever used a condom. Out of those, 23.1% had used it most of the time and only 15.4% reported that they always use a condom when having sex.

Only 1.7% of respondents reported having received HPV vaccinations, and out of those, only 0.8% had gotten all recommended three shots. However, about half of the participants (47.5%) stated that they do not know whether they have been vaccinated for HPV.
Table 3.

**Preventive health behaviors of sample respondents**

<table>
<thead>
<tr>
<th>Characteristic (n = 118)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever visited a gynecologist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>84</td>
<td>71.2%</td>
</tr>
<tr>
<td>Once every 5 years</td>
<td>13</td>
<td>11.0%</td>
</tr>
<tr>
<td>Once every 3 years</td>
<td>9</td>
<td>7.6%</td>
</tr>
<tr>
<td>Once every 2 years</td>
<td>3</td>
<td>2.5%</td>
</tr>
<tr>
<td>At least once a year</td>
<td>9</td>
<td>7.6%</td>
</tr>
</tbody>
</table>

Table 3 - continued

<table>
<thead>
<tr>
<th>Characteristic (n = 118)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever had vaginal sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>11.9%</td>
</tr>
<tr>
<td>No</td>
<td>104</td>
<td>88.1%</td>
</tr>
</tbody>
</table>

**Number of sexual partners ever had (if sexually active)**

Mean: 1.19  
Std. Deviation: 0.69  
Median: 1  
Mode: 1  
Minimum: 1  
Maximum: 5

<table>
<thead>
<tr>
<th>Ever been vaccinated for HPV</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, I have got all 3 shots</td>
<td>2</td>
<td>1.7%</td>
</tr>
<tr>
<td>Yes, I have got only 2 shots</td>
<td>1</td>
<td>.8%</td>
</tr>
<tr>
<td>Yes, I have got only 1 shot</td>
<td>1</td>
<td>.8%</td>
</tr>
<tr>
<td>No</td>
<td>58</td>
<td>49.2%</td>
</tr>
<tr>
<td>I don’t know</td>
<td>56</td>
<td>47.5%</td>
</tr>
</tbody>
</table>

**Frequency of using a condom when having vaginal sex**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>8</td>
<td>61.5%</td>
</tr>
<tr>
<td>Most of the time</td>
<td>3</td>
<td>23.1%</td>
</tr>
<tr>
<td>Always</td>
<td>2</td>
<td>15.4%</td>
</tr>
</tbody>
</table>

**Frequency of performing breast self-exams**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>68</td>
<td>57.6.0%</td>
</tr>
<tr>
<td>Once a year</td>
<td>14</td>
<td>11.9%</td>
</tr>
<tr>
<td>3-4 times a year</td>
<td>17</td>
<td>14.4%</td>
</tr>
<tr>
<td>Once a month</td>
<td>9</td>
<td>7.6%</td>
</tr>
<tr>
<td>Twice a month or more</td>
<td>10</td>
<td>8.5%</td>
</tr>
</tbody>
</table>
4.1.3. Knowledge

A total of 93.2% of participants had heard of breast cancer and 72.0% were aware about cervical cancer. However, only 28.0% of females had ever heard about HPV and 44.1% stated that they do not know what PAP-test is.

For each studied behavior, the respondents were asked to self-evaluate their knowledge on the behaviors on a ten-point scale. As can be seen in table 4, the average self-perceived knowledge score was the highest for condom use (5.20), followed by breast self-exams (4.16), and lowest average self-perceived knowledge was reported for HPV (1.31).

Table 4.

<table>
<thead>
<tr>
<th>Behaviors (n = 118)</th>
<th>HPV vaccination</th>
<th>Condom use</th>
<th>Breast self-exams</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean: 1.31</td>
<td>Mean: 5.20</td>
<td>Mean: 4.16</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation: 2.21</td>
<td>Std. Deviation: 3.26</td>
<td>Std. Deviation: 4.16</td>
</tr>
<tr>
<td></td>
<td>Median: 0.00</td>
<td>Median: 5.00</td>
<td>Median: 3.00</td>
</tr>
<tr>
<td></td>
<td>Mode: 0.00</td>
<td>Mode: 5.00</td>
<td>Mode: 0.00</td>
</tr>
<tr>
<td></td>
<td>Minimum: 0.00</td>
<td>Minimum: 0.00</td>
<td>Minimum: 0.00</td>
</tr>
<tr>
<td></td>
<td>Maximum: 10.00</td>
<td>Maximum: 10.00</td>
<td>Maximum: 10.00</td>
</tr>
</tbody>
</table>
4.1.4. Use of ICTs

As presented in Table 5, a total of 99.2% of participants owned a mobile phone and 95.8% of them use it for texting, 94.1% for calling, 72.0% for data services and 66.1% download phone applications.

A great majority of respondents (95.8%) also have a personal computer with Internet access. Almost half of them (49.2%) use Internet once a week to one or two times a month for looking for health related information.

Table 5.
Current use of ICTs of sample respondents

<table>
<thead>
<tr>
<th>Characteristics (n = 118)</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owns a mobile phone</td>
<td>117</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>99.2%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Use of cell phone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texting</td>
<td>113</td>
<td></td>
</tr>
<tr>
<td></td>
<td>95.8%</td>
<td></td>
</tr>
<tr>
<td>Calling</td>
<td>111</td>
<td></td>
</tr>
<tr>
<td></td>
<td>94.1%</td>
<td></td>
</tr>
<tr>
<td>Data</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td></td>
<td>72.0%</td>
<td></td>
</tr>
<tr>
<td>Apps</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td></td>
<td>66.1%</td>
<td></td>
</tr>
<tr>
<td>Owns personal computer with Internet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>113</td>
<td></td>
</tr>
<tr>
<td></td>
<td>95.8%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.2%</td>
<td></td>
</tr>
<tr>
<td>Frequency of using Internet for health related information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Several times a day</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.9%</td>
<td></td>
</tr>
<tr>
<td>About once a day</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.1%</td>
<td></td>
</tr>
<tr>
<td>About once a week</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21.2%</td>
<td></td>
</tr>
<tr>
<td>1-2 times a month</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>28.0%</td>
<td></td>
</tr>
<tr>
<td>Less than once a month</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24.6%</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15.3%</td>
<td></td>
</tr>
</tbody>
</table>

4.2. Reliability of Measures

The reliability of the measures was assessed by computing Cronbach’s alpha coefficients for each used scale for each studies behavior. For the two-item scales (perceived normative pressure and self-efficacy) the internal consistency was evaluated by using the Spearman-Brown
statistic that has been found to be more appropriate reliability coefficient for such measures (Eisinga, Grotenhuis, & Pelzer, 2012). For all multi-item scales (Table 6), the reliability scores were higher than the criterion value of 0.70 (Kline, 1999), suggesting a sufficient degree of internal consistency. The adjusted item total correlations ranged from 0.32 to 0.91 across all scales.

However, for all behaviors, one or both two-item scales measuring perceived normative pressure or perceived behavioral control, did not meet the reliability coefficient criteria. Single-item measures of perceived behavioral control were tested for HPV vaccination and breast self-exams and single-item measures of perceived normative pressure were tested for condom use. However none of these models showed better results compared to the models with two-item measures, therefore, using one-item measures in these models was not justified.

Table 6.

<table>
<thead>
<tr>
<th></th>
<th>Cronbach's α</th>
<th>Corrected Item-total correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HPV vaccination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>0.923</td>
<td>0.785-0.913</td>
</tr>
<tr>
<td>Attitudes</td>
<td>0.889</td>
<td>0.322-0.797</td>
</tr>
<tr>
<td>Perceived Normative Pressure</td>
<td>0.697</td>
<td>0.535</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>0.492</td>
<td>0.326</td>
</tr>
<tr>
<td><strong>Condom use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>0.887</td>
<td>0.649-0.857</td>
</tr>
<tr>
<td>Attitudes</td>
<td>0.882</td>
<td>0.480-0.785</td>
</tr>
<tr>
<td>Perceived Normative Pressure</td>
<td>0.584</td>
<td>0.413</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>0.718</td>
<td>0.560</td>
</tr>
<tr>
<td><strong>Breast self-exams</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>0.898</td>
<td>0.741-0.904</td>
</tr>
<tr>
<td>Attitudes</td>
<td>0.897</td>
<td>0.418-0.831</td>
</tr>
<tr>
<td>Perceived Normative Pressure</td>
<td>0.800</td>
<td>0.666</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>0.630</td>
<td>0.460</td>
</tr>
</tbody>
</table>
4.3. Descriptive Analysis

For each studied behavior, the study measures were combined into four different indices by averaging the item scores. Therefore, higher scores reflected greater intention to perform the behaviors, greater positive attitude toward the behavior, greater social pressure to do the target behavior, and greater level of control over the target behavior respectively.

At first, it was checked whether random assignment had worked for this experiment. For that the t-tests for independent means was conducted for demographic and knowledge variables. The analysis indicated that all t-tests were not significant (p > 0.05), confirming that both groups were equivalent at the beginning of the study.

Table 7 presents the means, standard deviations and Pearson correlations for each averaged index score. Overall, out of the measured constructs, the average scores were the highest for attitudes and lowest for perceived normative pressure. The results report that on average, the participants held quite strong positive attitudes toward breast self-exams ($M = 5.48$, $SD = 1.18$), condom use during vaginal sex ($M = 5.15$, $SD = 1.15$), and HPV vaccination ($M = 4.57$, $SD = 1.39$). On average, the perceived normative pressure was higher for condom use ($M = 4.20$, $SD = 1.29$) and breast self-exams ($M = 3.96$, $SD = 1.42$) and relatively low for HPV vaccination ($M = 2.97$, $SD = 1.52$). Respondents, on average, also reported moderate to high levels of control over the behaviors. They perceived to have the greatest level of control over breast self-exams ($M = 5.49$, $SD = 1.56$), and somewhat less for condom use ($M = 4.78$, $SD = 1.52$) and HPV vaccination ($M = 4.34$, $SD = 1.50$). Finally, on average, the participants reported moderate intention to perform the studied behavior. Similar to attitudes and perceived behavioral control, the average score for intentions was the highest for breast self-exams ($M = 4.95$, $SD = 1.54$), followed by condom use ($M = 4.76$, $SD = 1.72$) and HPV vaccination ($M = 4.07$, $SD = 1.75$).

As can be seen in Table 7, the majority of bivariate correlation coefficients reflected weak to moderate positive correlations. For most of the variables, Pearson Product Moment Correlations for indexes varied between 0.26 and 0.50, suggesting a moderate correlation between the variables (Losh, 2004). Only for breast self-exams, the correlation for intentions and attitudes was 0.58, indicating a quite strong correlation between these two variables.
Table 7.
Descriptive statistics and Pearson Product-Moment correlations among the variables

<table>
<thead>
<tr>
<th></th>
<th>HPV vaccination</th>
<th>Condom use</th>
<th>Breast self-exams</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1 Attitudes</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 PNP</td>
<td>0.38**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>3 PBC</td>
<td>0.22*</td>
<td>0.11</td>
<td>1.00</td>
</tr>
<tr>
<td>4 Intentions</td>
<td>0.48**</td>
<td>0.35**</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Sample size</th>
<th>Index Average</th>
<th>Index SD</th>
<th>Number of Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>118</td>
<td>4.57</td>
<td>1.39</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>2.97</td>
<td>1.52</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>4.34</td>
<td>1.50</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>4.07</td>
<td>1.75</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>5.15</td>
<td>1.15</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>4.20</td>
<td>1.29</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>4.78</td>
<td>1.52</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>4.76</td>
<td>1.72</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>5.48</td>
<td>1.18</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>3.96</td>
<td>1.42</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>5.49</td>
<td>1.56</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>118</td>
<td>4.95</td>
<td>1.54</td>
<td>3</td>
</tr>
</tbody>
</table>

Notes: All correlations were calculated as two-tailed significance.
*p < 0.05; ** p < 0.01.
4.4. Test of the Proposed Model

Several goodness-of-fit indices were used to test the fit between the obtained data and the suggested research model. Results of the path analysis indicated that the models for each studied behavior had a poor fit. For all behaviors, the chi-square goodness of fit test failed to be rejected (for HPV vaccination $\chi^2$ (df=4) = 29.79; p < 0.01; for condom use $\chi^2$ (df=4) = 38.70; p < 0.01; for breast self-exams $\chi^2$ (df=4) = 48.73; p < 0.01), referring to poor data fit. Other fit indices indicted the same for all studied behaviors (for HPV vaccination RMSEA = 0.23; CFI = 0.56; TLI = -0.11; SRMR = 0.12; for condom use RMSEA = 0.27; CFI = 0.49; TLI = -0.28; SRMR = 0.14; for breast self-exams RMSEA = 0.31; CFI = 0.53; TLI = -0.17; SRMR = 0.17). In summary, the goodness-of-fit measures suggested that the IM does not represent an acceptable model for explaining HPV vaccination, condom use during vaginal sex and performance of breast self-exams among young Pakistani college females.

Although the statistical analysis program included several modification suggestions to improve model fit, no attempt was made to improve the model fit by deleting nonsignificant parameters. The purpose of using the IM model and to conduct path analysis in this study was to identify if intention to perform certain preventive health behaviors among young Pakistani college females is a function of some or all the IM's main determinants. Therefore, as suggested by Bleakley, Hennessy, Fishbein, & Jordan (2011), nonsignificant parameters should not be treated as statistically irrelevant coefficients but as important substantive findings.

4.5. Hypotheses Testing

Hypothesis 1

Because the integrated theory of behavior prediction indicates that intentions are the immediate antecedent of behaviors, an intentions construct was used to measure the overall treatment effect of the health information website. Hypothesis 1 predicted that students in the experiment group will have higher intentions to perform (a) HPV vaccination, (b) condom use, and (c) breast self-exams. Ordinary linear regression was used to test the treatment effect on intentions to perform each studied behavior. Because only one of the respondents was not single, the treatment and control group must be slightly unbalanced in respect to marital status, and the
regression models therefore include a binary indicator for the respondent who lived with an intimate partner. As it was hypothesized that exposure to the health information website would have positive impact on intentions, the treatment effect was tested by using one-tailed tests.

As Table 8 reports, the information website GirlTalk had a significant effect on Pakistani student's intentions to get vaccinated for HPV (B=0.55; p=0.043) and to perform monthly breast self-exams (B=0.55; p=0.027). There was no statistically significant difference between groups regarding intention to use condoms during vaginal intercourse and therefore hypothesis 1(b) was not supported. In summary, in accordance with hypotheses 1(a) and 1(c), the treatment group had higher intention rate to perform breast self-exams and get vaccinated for HPV.

Table 8.

Linear Regression Analysis Summary

Predicting Pakistani young females' intention to get vaccinated for HPV, use a condom, and perform breast self-exams

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>St. Err</th>
<th>β</th>
<th>t</th>
<th>P</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPV Vaccination</td>
<td>0.55</td>
<td>0.32</td>
<td>0.16</td>
<td>1.73</td>
<td>0.043</td>
<td>-0.08</td>
</tr>
<tr>
<td>Condom use</td>
<td>-0.02</td>
<td>0.32</td>
<td>-0.01</td>
<td>-0.08</td>
<td>0.470</td>
<td>-0.66</td>
</tr>
<tr>
<td>Breast self-exams</td>
<td>0.55</td>
<td>0.28</td>
<td>0.18</td>
<td>1.95</td>
<td>0.027</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

Notes: One-tailed directional significance testing

Hypotheses 2-4

In order to examine the comparative strength of direct and indirect relationships among the variables, to understand the interrelationships among variables (H2-H4) in the IM model and to test the ability of the IM to predict intentions to perform three health behaviors, path analyses were conducted for each behavior. Table 9 illustrates the causal links between the IM variables when used to predict the intention to get HPV vaccination, use a condom regularly during vaginal sex and perform monthly breast self-exams among young Pakistani college females. As can be seen in Table 9, for all studied health behaviors, attitudes had a significant positive relationship at least between one of the constructs for this sample. Figures 4-6 present the path coefficients for the relationships between constructs for each model.
Table 9.

*Unstandardized estimates for HPV vaccination, condom use, and breast self-exams models*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>HPV vaccination</th>
<th>Condom use</th>
<th>Breast self-exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ATT → INT</td>
<td>0.54*** 0.11</td>
<td>0.44*** 0.13</td>
<td>0.61*** 0.11</td>
</tr>
<tr>
<td>2 PNP → INT</td>
<td>0.22* 0.10</td>
<td>0.39*** 0.11</td>
<td>0.08 0.08</td>
</tr>
<tr>
<td>3 PBC → INT</td>
<td>-0.11 0.94</td>
<td>0.15 0.10</td>
<td>0.20* 0.81</td>
</tr>
<tr>
<td>4 GRP → ATT</td>
<td>-0.22 0.25</td>
<td>0.16 0.21</td>
<td>0.11 0.22</td>
</tr>
<tr>
<td>5 GRP → PNP</td>
<td>0.13 0.28</td>
<td>0.05 0.24</td>
<td>-0.18 0.26</td>
</tr>
<tr>
<td>6 GRP → PBC</td>
<td>0.06 0.28</td>
<td>-0.08 0.28</td>
<td>0.20 0.29</td>
</tr>
</tbody>
</table>

Notes: * p < 0.05, ** p < 0.01, *** p < 0.001.
ATT refers to Attitudes, INT refers to Intentions, PNP refers to Perceived Normative Pressure, PBC refers to Perceived Behavioral Control, GRP refers to the Group variable (exposure to the intervention).

**HPV vaccination**

For HPV vaccination, the attitudes toward HPV vaccination had a significant positive effect on intentions ($\beta=0.44$, SE=0.08, $p<0.001$), supporting hypothesis H2a. Perceived normative pressure had a significant effect on intentions to get vaccinated for HPV ($\beta=0.20$, SE=0.09, $p<0.05$), which supports hypothesis H3a. The path analysis indicated that perceived behavioral control did not have a statistically significant relationship with intentions, therefore, hypotheses H4a was not supported in this sample.
Figure 4. Path analysis for HPV vaccination (standardized coefficients)

*p < 0.05, **p < 0.01, ***p < 0.001.

Notes: PNP refers to Perceived Normative Pressure and PBC refers to Perceived Behavioral Control

Condom use

For condom use, attitudes had a positive influence on intentions to regularly use a condom when having vaginal sex ($\beta=0.31$, SE=0.08, p<0.001), supporting hypothesis H2b. Also, the data indicated that stronger perceived normative pressure to use a condom have a positive effect on intentions to use a condom when having vaginal sex among Pakistani young college females ($\beta=0.30$, SE=0.09, p<0.001), supporting hypothesis H3b. The path analysis indicated that there was no significant relationship between perceived behavioral control and intentions, thus, hypotheses H4b was not supported by this data.
**Breast self-exams**

Similarly to HPV vaccination and condom use, attitudes were also positively associated with the intention to perform monthly breast self-exams ($\beta=0.49$, SE=0.08, $p<0.001$), thus, hypothesis H2c was supported. It was also found that greater perceived behavioral control was significantly related to higher intentions to perform monthly breast self-exams ($\beta=0.21$, SE=0.09, $p<0.05$), supporting hypothesis H4c. However, unlike other studied behaviors, perceived normative pressure to perform breast self-exams was not significantly related to intentions. Therefore, hypotheses H3c was not supported.
RQ1

As reported in Table 10, attitudes, perceived normative pressure and perceived behavioral control accounted for 25% of the variance in the intentions to get vaccinated for HPV in the control group and 28% of the variance in the treatment group. As a whole, the explanatory power of these three mediating variables in condom use intentions was 25% and 26% in the experiment and control group respectively. Finally, attitudes, perceived normative pressure and perceived behavioral control explained best the variance in breast self-exams intentions, reaching 38% in the treatment group and 36% in the control arm.
Table 10.

*Explanatory power of the model for HPV vaccination, condom use and breast self-exams intentions*

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Adjusted $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HPV Vaccination</strong></td>
<td></td>
</tr>
<tr>
<td>Exp Group</td>
<td>0.28</td>
</tr>
<tr>
<td>Control</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Condom use</strong></td>
<td></td>
</tr>
<tr>
<td>Exp Group</td>
<td>0.25</td>
</tr>
<tr>
<td>Control</td>
<td>0.26</td>
</tr>
<tr>
<td><strong>Breast self-exams</strong></td>
<td></td>
</tr>
<tr>
<td>Exp Group</td>
<td>0.38</td>
</tr>
<tr>
<td>Control</td>
<td>0.36</td>
</tr>
</tbody>
</table>

*RQ2*

Data analysis indicated that exposure to the health information website GirlTalk did not have a significant relationship with attitudes, perceived normative pressure or perceived behavioral control associated with HPV vaccination, regular condom use during vaginal sex or monthly breast self-exams among the sample of young Pakistani college females.

In summary, the results of the regression analysis indicated that in accordance with the hypothesis in this study, young Pakistani females in a treatment group had statistically significantly higher intentions to perform monthly breast self-exams and get vaccinated for HPV compared to the students in the control group. As the results of path analyses report, for each studied behavior, attitudes toward HPV vaccination, condom use and breast self-exams had a positive influence on intentions to perform these health behaviors. The hypothesis that perceived norms would influence intentions was supported only for HPV and condom use, but not for performing breast self-exams. Finally, it was found that higher perceived behavioral control was significantly related to higher intentions only for breast self-exams, but not for HPV vaccination and regular condom use during vaginal intercourse.
CHAPTER 5

DISCUSSION

Communication related to sexual health and cancer is challenging especially in conservative societies such as Pakistan. Due to social stigmas, topics related to sex and female cancer prevention are rarely discussed at home, among friends or in school. For the same reasons, individuals who suffer with such health issues are reluctant to seek medical help. This is especially the case for young females, who because of gender imbalances, socio-cultural norms and restrictions are often uninformed about sexual health and cancer prevention issues and do not have access to professional advice on these topics. This section of the dissertation discusses the findings presented in chapter four, brings out the limitations of the study, and makes recommendations for future research.

This study was one of the first of its kind aimed at examining the factors that influence preventive sexual health and female cancer behaviors in Pakistan. More precisely, the study had two goals. Firstly, a customized health information website GirlTalk was designed for this experiment and the objective was to test its effectiveness in influencing young Pakistani females' intention to perform monthly breast self-exams, regularly use a condom when having vaginal sex, and get vaccinated for human papillomavirus (HPV). Secondly, the study aimed to test the applicability of the integrated model of behavior prediction (IM) when predicting the intentions to perform the three abovementioned health behaviors among young Pakistani college females. The study was designed as a randomized experiment with two study arms and used a convenience sample of female college students from four Pakistani universities in Lahore and Karachi.

It was hypothesized that students who have access to the health information website, have higher intention to perform monthly breast self-exams, regularly use a condom when having sex, and get vaccinated for HPV. The results of the regression analysis indicated that young Pakistani females who were exposed to the educational health intervention GirlTalk had significantly higher intentions to get vaccinated for human papillomavirus and perform monthly breast self-exams than the students who did not have access to the website.
However, the results of the study also suggested that the effects of GirlTalk had an extremely low correlation with the attitudes, perceived normative pressure and perceived behavioral control in this sample of college females. This implies that exposure to customized health information did not have statistically significant effect on any of the variables of the IM that determine young Pakistani females’ intention to perform these three studied health behaviors.

These results are not in accordance with most of the previous research which suggests that computer-delivered interventions improved attitudes and intentions to perform certain health behaviors (Portnoy, Scott-Sheldon, Johnson, & Carey, 2008). However, literature on the effectiveness of primarily educational websites (e.g. Cushing & Steele, 2010) supports the findings of this study as most of such efforts have found no significant effect of primarily educational e-interventions on health outcomes.

There may be several reasons for the nonsignificant findings. Due to the limitations of the study design, borne out of the logistic impossibility of observing subjects while they receive this particular manipulation, it is not known how long the participants spent time on the website and how thoroughly they studied the presented information. Even if there was some logistic possibility of observing how thoroughly the subjects use the website, it would have violated one of the basic needs of the study; anonymous access and privacy of review of health materials. Additionally, although several theoretical frameworks (e.g. the transtheoretical model, the precaution adoption process model) suggest that knowledge is an important factor in changing health behaviors, increased knowledge does not necessarily lead to changed intention to change behavior. Furthermore, the nonsignificant results may also have been due to the lack of testing for a possible sleeper effect (Hovland, Lumsdaine, & Sheffield, 1949) where the impact of health messages may increase over time. A longitudinal study is needed in order to measure the same variables again after a longer period of time.

In terms of the predictive power of IM model, it was hypothesized that intentions to perform breast self-exams, use a condom and getting vaccinated for HPV are positive functions of attitudes, perceived normative pressure and perceived behavioral control. Similar to the findings of Bleakley et al. (2011), Sheeran & Taylor (1999), Albarracin, Johnson, Fishbein, &
Muellerleile (2001), and Bennett & Bozionelos (2000), attitudes were found to be the best predictor of young females' intention to perform safe sex and cancer prevention behaviors.

The explanatory power of the IM model in the sample of young Pakistani females was relatively low, reaching 25% for condom use and HPV vaccination and 38% for breast self-exams. This is significantly lower than in previous studies where for instance the core predictors explained 72% of the variance in intentions to perform breast self-exams (Norman & Hoyle, 2006). Similarly, an inclusive review on condom use, Albarracin et al. (2001) reported that across studies, attitudes, perceived behavioral control and social norms explain 50% of the variance in intentions.

One of the findings of this study was that perceived behavioral control was not predictive of young females' intentions to use a condom regularly or to get vaccinated for HPV; however, it was found to significantly contribute to the prediction of intentions to perform breast self-exams. A possible reason for this result is that perceived behavioral control does not reflect actual control, another construct of the IM model that refers to environmental factors as well as individual's skills and abilities that are required to perform the behavior.

Out of the three studied behaviors, performing breast self-exams is the only one that does not need external input and interaction as it can be executed in a private space. In contrast, the purchase of a condom requires the female subjects to actually venture into a store or pharmacy and communicate their need to the shopkeeper, and the administration of HPV vaccination requires them to visit a health facility requiring interaction and exchange of information with a doctor or nurse, greatly mitigates their intention to use. While the experimental intervention most certainly provided the subjects with a more encompassing understanding of the need for condoms and their proper use, and an understanding of the long term benefits of HPV vaccination, it did not provide the subjects with a facility to actually acquire the condoms or the vaccination without incurring the very social repercussions that prevent sexual health information from reaching the subjects. This facility is a planned part of further iterations of the experimental solution.

Another interesting finding was that perceived normative pressure was highly predictive of behavioral intentions to use a condom but lesser so with HPV vaccination and was not predictive of young females intentions to perform breast self-exams. It may be speculated that out of the three studied behaviors, condom use has been the best communicated health topic in
Pakistan. The Ministry of population welfare in Pakistan along with several nongovernmental organization have run pro prophylactic campaigns for decades. They have however mostly been cryptic in their messages as the communication designers try to avoid any direct reference to recreational procreation. Mostly basing their appeals on family planning often without even using the word condom. Even though these campaigns have resulted in more people knowing about the existence of condoms as a birth control measure, such indirect messaging has served to reinforce the stigma of condom use by disallowing a desensitization to the subject matter. The result is that the purchase of a condom is still considered socially undesirable due to the implication that it will lead to sexual acts, however when framed in the context of family planning, it is considered socially acceptable.

This is also reflected in the study participants' self-perceived knowledge scores, where the score for condom use was relatively higher than for other behaviors. Therefore, it can be assumed that exposure to information emphasizing the importance of safe sex, increases young Pakistani females' intention to practice safe sex by increasing their perceived normative pressure to do so. The pre-exposure to condom use health campaigns may also have mitigated the effectiveness of the condom use element of the experimental manipulation.

Perceived normative pressure was found to have a small contribution to explaining the variance in intentions to get vaccinated for HPV. This may be the case because in urban areas, especially among people who are more educated, vaccinations in general are perceived as an acceptable practice (Naeem, et al., 2011). Compounding this existing acceptability of vaccines are active efforts undertaken in Pakistani media to reassert the need for vaccinations as a measure of disease control (Shah, 2012). These efforts have mostly been aimed at discussing and disarming the suspicions of Pakistan's rural northern population, which has long been resistant to vaccinating their children in light of rumor mongering and the use of such campaigns by covert security agencies (Shah, 2011). The media messages focus on incorporating a sense of medical need taking priority over societal suspicion (Agence France-Presse, 2012), and may contribute directly to the attenuated effects of perceived normative pressure found in these results, as urban subjects exposed to such campaigns may further feel vaccination to be an acceptable and desirable practice in their society. Additionally, as mentioned earlier, the main determinant of intention to perform preventive health behaviors is attitudes, whereas comparatively stating, perceived norms only account for a small change in intentions to practice such behavior.
It is important to note that the gamut of societal and cultural limitations and peculiarities that the study faced forms an important resource for strategic planning of further studies in the region. It was found that most of the stereotypes that existed about the Pakistani society, including but not limited to excessive parental control, unequal treatment for women, fear of religious taboos and lack of acceptance of current state of affairs, were very much visible throughout the study process. Illustrating these issues was the fact that despite agreeing with the needs analysis of this study and supporting its aims and experimental objectives, there was one large educational institution in which the administration declined official access to female students for the fear of being misunderstood by religious extremists.

At the start of the study, there was a strong possibility of a mitigated or even negative response from the target group, based on their lack of understanding of their own needs, cultural and religious taboos to accessing sexual health information, the direct nature of the study questionnaires (as opposed to the indirect and ambiguous messaging of official family planning campaigns), and mistrust and fear of any breach of anonymity. However, the experience was quite the opposite. Despite the existence of the limitations listed, the female subjects themselves, in overwhelming majority were interested in signing up for the study and were open in strong support of the study objectives and its resulting implications for women’s health in Pakistan. The inquiry email address provided to the subjects in case they wanted further information on the study (once data collection had been fully completed), received many messages from subjects thanking the researcher for recognizing the need for such an intervention and their desire to use the resource in their everyday life once it is fully operational.

This is a significant indication of the presence of a strong will on the part of the target group to adopt such interventions despite the continuing presence of social and cultural restrictions. It is also a validation of this study’s situation analysis that indicated the need for such a resource. While interventions such as GirlTalk may not directly have any effect on mitigating the restrictive environment that the target group endures, it does provide an actionable resource for the improvement of general quality of female cancer and sexual health information and opens the door for other socially and culturally challenged, but critically needed information to be delivered to this underserved population.
5.1. Limitations of the Study

This study had several limitations. Due to a small sample size, the whole IM model could not be tested and the belief measures had to be left out from the analysis. In addition, the initially intended structural equation modeling method could not be used and therefore a great amount of valuable data was excluded from the study.

Another limitation of the study was that the study was based on individual's self-reported data, therefore, respondents may have under-reported or over-reported the data, especially for behavioral factors which could lead to possible inaccuracy. Furthermore, as the experiment was conducted online, there was no control over the environmental conditions where the questionnaires were filled out which could have possibly caused interparticipant bias through the diffusion of treatment effect and have affected the accuracy of the results. Although the questionnaire for the experiment group was split into two parts to guard against subject weariness, due to the extensive belief measures, the questionnaire may still have been too long and cause respondent fatigue.

In addition, as the study only used subjects who volunteered to sign up, there may be a possibility for self-selection bias, which means that the study participants could have been more interested in health issues than the average young female in Pakistani universities.

Another potential limitation in this study is the unknown impact of the website's design on information processing. The GirlTalk website that was used in this study included quite extensive amount of text, however, studies have shown (e.g. Choi & Bakken, 2010; Sillence, Briggs, Harris, & Fishwick, 2007) that when looking for health information, individuals often prefer to have shorter amounts of text as exposure to too much or detailed information may be perceived as overwhelming and results in rejecting the website. Therefore, there may be a risk that students who were exposed to the website, just skimmed through the text instead of carefully reading the provided materials.

Additionally, in order to ensure anonymity and to guard against subject insecurity based on perceptions that their usage may be tracked back to them, the flash based website did not have a login system. The lack of this feature however meant that it was not possible to track the time each participant spent on the website and how deeply they were engaged in the presented
information. Although there was a manipulation check question for the experiment group, asking subjects to identify the topics covered on the website, it might have been that the topics were easily detectable by the participant even when she had not spent more than a few minutes on the website.

The measures of some constructs as used in this study could indicate methodological limitations. More specifically, as discussed in the methodology section of this dissertation, semantic differential approach has been acknowledged as a standard tool for measuring attitudes in the IM model (Fishbein & Ajzen, 2010; Francis et al., 2004). However, some authors (e.g. Valois & Godin, 1991; Heise, 1969) have addressed the methodological issues related to using the semantic differential approach when measuring attitudes, emphasizing the importance of carefully selecting the adjective pairs to make sure that the endpoints of the scale have similar levels of consistency. Furthermore, it is suggested that tailoring semantic differential scales to a new content area requires extensive pretesting (Heise, 1969). Although the measures used in this study were previously tested in the field of sexual health in the developed countries, this study was one of the first to use them in Pakistan.

Another potential limiting factor was the reliability of perceived behavioral control and perceived normative pressure measures. Although the used scales were developed based on previously tested measures, internal consistency of two-item scales was unacceptably low in this sample. Therefore, further testing of the scales is needed in order to find more reliable measures that would be suitable for these specific behaviors in this population.

5.2. Future Research

As the research of sexual health and female cancer prevention in conservative societies is almost nonexistent, there is a great need for further studies in this field. Primarily, it would be interesting to explore the applicability of the whole IM model when assessing the effectiveness of web-based health information sources in conservative countries. Including the indirect belief measures in the analysis would give valuable information on which specific beliefs are associated with attitudes, perceived behavioral control and perceived norms. Knowing which beliefs contribute to positive attitudes, for example, would be useful information when designing health messages.
Despite the logistic difficulty in doing so for the hard to reach populations, future research applying the IM model should aim for larger sample sizes, so that more stable estimates and more sophisticated statistical methods such as structural equation modeling could be used. Use of latent variable modeling procedures allows the estimation and removal of random and correlated measurement error, which means that structural equation modeling analysis provides more accurate estimates of the effects of interventions (Russell, Kahn, Spoth, & Altmaier, 1998). Therefore, SEM would be the preferred method in such cases as it allows the examination of the relationship between several independent and dependent variables at the same time while simultaneously indicating how well each variable is measured.

Secondly, in order to get more information about the effect of online health information use, future studies should include several temporally distant data collection points to understand the short- and long-term effects of such communication on intentions to perform preventive behaviors for safe sex and female cancers. Furthermore, if possible, future studies should measure actual behavior to assess the full explanatory power of the model.

Previous studies in the field of sexual health and female cancer prevention (e.g. Smith-McLallena & Fishbein, 2009; Bleakley et al., 2011) have found that ethnicity and gender have played a role in terms of the strength of intentions to perform preventive health behaviors. Therefore, it would be interesting to see whether similar intentions to practice safe sex apply also for males in Pakistan. Furthermore, it would be useful to know how participants' ethnic background influences the patterns of associations between the IM variables.

Finally, although the health information website tested in this study applied the strategies of creating culturally sensitive materials, an investigation should be made as to which customization strategies worked better. Lastly, once Girl Talk is launched as a publically accessible full-scale website, it would be interesting to explore the actual usage patterns of this web-based health information source not only among college girls but also other populations in Pakistan.

5.3. Conclusion

Sexual health and cancer prevention are difficult topics to talk about especially in deeply religious countries where socio-cultural norms strongly restrict discussing such issues.
The current study is one of the first in the field that seeks to study the potential of online women's and sexual health educational interventions in ultra-conservative societies. The site provides a platform for research on sexual and women's health in religiously conservative areas, and in case of success can be modified to be applied as a sustainable health communication tool to similar situations in other conservative and underserved regions.

The study results indicated that targeted educational health interventions could have potential when educating individuals in conservative societies about sexual health and female cancer prevention. It was found that young Pakistani college females who had access to the health website GirlTalk had significantly higher intentions to perform monthly breast self-exams and to get vaccinated for HPV as compared to girls who were not exposed to the intervention.

In addition, the study contributes to the health communication literature by exploring theoretical predictors of intentions to use a condom, perform breast self-exams and get vaccinated for HPV among young Pakistani females, an underserved and hard to reach population. The findings of this study partially support the IM model, suggesting that attitudes are the strongest predictor of intentions. However, as there are almost no related previous studies in such populations, there is a great need to investigate these health communication issues further to gain better understanding about the factors that influence health behaviors among conservative populations in less developed countries.

The results of this study address a significant gap in original research on sexual health practices and women cancer prevention behaviors in Pakistan, providing a valuable bed of information for future researchers to build on. It is likely to assist many young Pakistani females in understanding and accepting their health needs, hopefully cutting through the centuries of socially imposed fetters against such topics. This is also likely to improve the uptake of sexual and women's health based development programs in the future, as target populations armed with scientific knowledge rather than folklore are likely more susceptible to arguments based on logic and fact.
APPENDIX A

INFORMED CONSENT FORM

I freely and voluntarily and without element of force or coercion, consent to be a participant in the research project entitled: Health behavior.

This research study is being conducted by Ms. Mariliis Vahe, a PhD candidate in the College of Communication and Information at the Florida State University in the United States and supervised by Dr. Stephen D. McDowell, Director of the FSU School of Communication. I understand that the purpose of the research project is to better understand women's health knowledge, attitudes and behaviors.

I understand that this study will take about 20 minutes. During that time I will be asked questions about my health behaviors, knowledge and attitudes. I understand I will be asked for demographic information. The demographic information will be used for classification purposes only. I understand that after filling out the questionnaire, I might be asked to look at web-site containing information about women's health.

I understand that my participation in this study is voluntary and I may decline to participate without penalty at any time. My name will not appear on any of the results, no individual responses will be reported and only group findings will be reported. The information in the study records will be kept confidential to the extent allowed by law and answers can be accessed only by the researcher.

I understand that my agreement with the consent form indicates my agreement to participate in the study. However, I also realize that I can withdraw at any time. I understand that data will be stored securely and will be made available only to persons conducting the study. The data will be protected by password known only to the researchers and will be destroyed within ten years after collection of data.

I understand that I may contact researchers Mariliis Vahe [mv08f@fsu.edu] or Dr. Stephen McDowell [steve.mcdowell@cci.fsu.edu] for answers to questions about this research or my rights. Also, if I have any questions about my rights as a subject/participant in this research, or if I feel I have been placed at risk, I can contact the Chair of the Florida State University Human Subjects Committee, Institutional Review Board, through the Vice President for the Office of Research at +1 (850) 644-8633.

I have read and understand this consent form.

Agree          Disagree
APPENDIX B

IRB APPROVAL

The Florida State University
Office of the Vice President For Research Human Subjects Committee Tallahassee, Florida
32306-2742
(850) 644-8673 • FAX (850) 644-4392

APPROVAL MEMORANDUM (for change in research protocol)

Date: 2/12/2013

To: Mariliis Vahe

Address: [redacted]
Dept.: COMMUNICATION

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research (Approval for Change in Protocol)
Project entitled: Potential of web-based sexual health and preventive health behavior interventions targeted to young females in Pakistan

The form that you submitted to this office in regard to the requested change/amendment to your research protocol for the above-referenced project has been reviewed and approved.

If the project has not been completed by 6/12/2013, you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is FWA00000168/IRB number IRB00000446.

Cc: Stephen McDowell, Advisor
HSC No. 2013.9956
APPENDIX C

HEALTH INFORMATION WEBSITE GIRLTALK

Front page
Breasts' Health

When it comes to young women and breast cancer, there's good news and bad news. The good: Their chances of having the disease are much lower than an older woman's. The bad: If cancer does strike, it can be more aggressive.

Breast cancer is common

Breast cancer has the highest incidence and mortality rates among females worldwide, accounting for 20% of all new cancers in women. Every year approximately 1.4 million women are diagnosed with breast cancer and about 460,000 females die because of it. In Pakistan, breast cancer is the most common cancer among females, showing the highest incidence rate in the region.

Today nearly 70% of breast cancer deaths occur in low and middle income countries due to lack of systematic screening and education. Low awareness and inaccessible treatment and diagnosis facilities. In coming years it is estimated that breast cancer incidence rates will continue increasing especially among urban women in developing countries mostly due to changes in dietary habits, reduced physical exercise and delayed child birth.

Breast Self-Exams

Early detection of the disease is the key factor in reducing the mortality resulting from breast cancer. Although reaching the highest sensitivity in detecting breast cancer a combination of mammography, clinical breast exam and breast self-exam should be used. The first two methods are recommended for women over 40 years of age and are often not accessible in low income areas.

It is recommended that young females in their 20s should perform monthly breast self-examinations (BSE) as an awareness method for detecting early breast cancer. During the BSE, you can use different techniques to systematically examine your breast for unusual lumps, shape, or skin changes. BSEs have several advantages, including low cost, possibility for monthly assessment and having no barriers associated with accessing health care. In addition, BSEs help you learn the normal shape and feel of your breasts and increase your awareness of breast changes.

Breast Cancer Fighting Foods

1. Pulses (e.g. kidney beans, lentils, and chickpeas)

Pulses contain proteins that help extracts oestrogens out of our bodies. Too many oestrogens can cause breast cancer.

2. Pumpkins and cantaloupe melon:

Oranges or yellow coloured fruit and vegetables are a rich source of beta-carotene — which is the precursor of vitamin A and a potent antioxidant which helps fight off highly reactive molecules that can harm our body and lead to severe diseases such as breast cancer.

Why do young girls need to self-examine their breasts?

Getting into the habit of examining your breasts when you're still young can help you get used to the way they normally look and feel, and it will be easier to recognize anything unusual.

A breast self-exam (BSE) can help women detect signs of other benign (noncancerous) breast problems between checkups. It can also help some women detect breast cancer — a disease that is rare among younger women.

Although it might seem strange or inconvenient at first, BSE is a skill you can use throughout your life to help ensure good breast health.
Breast self-exams page
Cervical cancer is the second most common cancer diagnosed in Pakistani women. Every year about 11,700 Pakistani females are diagnosed with cervical cancer and more than 7,300 die from the disease. Cervical cancer is caused by a human papillomavirus (HPV), a widespread virus that infects most females and males during their lifetime. Due to scientific breakthroughs in recent years, there are now two vaccines available that protect against HPV.

### What is cervical cancer?
Cervical cancer is the cancer of the cervix, the lower part of the uterus that connects to the vagina. Cervical cancer can develop if you are exposed to certain high-risk types of human papillomavirus (HPV) and your body does not clear the infection.

Abnormal cells can develop in the lining of the cervix, and if not discovered early and treated, these abnormal cells can become cervical precancers and then cancer. Most infections can take a number of years, but in rare cases it can happen within a year.

### Who can get cervical cancer?
All women are at risk for cervical cancer. The human papillomavirus (HPV) is the main cause of cervical cancer. Cervical human papillomavirus (HPV) is the most common sexually transmitted virus. About 70% of all men and more than 3 out of 4 women have HPV at some point in their lives.

HPV is the main cause of cervical cancer. Ninety percent of cervical cancer cases are caused by HPV, and 15% of those are caused by other high-risk HPV types. Other factors that can cause cervical cancer includeovarian and uterine cancers. In fact, these types cause about 75% of cervical and up to 50% of vulvar cancer cases.

Although cervical cancer occurs most often in women over 30, many of those women were likely exposed to a lower-risk type of HPV in their teens and 20s. For the majority of women who have HPV, the body's defenses are enough to clear the virus. But for women who do not clear certain types of the virus, cervical cancer can develop later in life.

### How to prevent cervical cancer?
- **Get the HPV vaccine.** It protects against the types of HPV that most often cause cervical, vaginal, and vulvar cancers. It is given in series of three shots. The vaccine is recommended for 11- and 12-year-old girls. It is also recommended for girls and women aged 13 through 26 who did not get any or all of the shots when they were younger. [Read more](#).
- **See your doctor regularly for a Pap test.** This Pap test (for Pap smear) is a test that is usually done during the pelvic exam. It checks for precancer cell changes, on the cervix that can be treated, so that cervical cancer is prevented. The Pap test also can find cervical cancer early, when treatment is most effective. The Pap test is recommended for women aged 21-49 years old.
- **Use condoms during sex.** HPV infection can occur in both male and female genital areas that are covered or protected by a latex condom, as well as in areas that are not covered. While the effect of condoms in preventing HPV infection is unknown, condon use has been associated with lower rate of cervical cancer.
- **Don't smoke.**

### How Is Human Papillomavirus (HPV) spread?
- **Anyone who has ever had genital contact (vaginal or anal intercourse, oral sex or genital-to-genital contact) with another person can have genital HPV.**
- **Both men and women can get it—and pass it on—even without ever realizing it.**
- **In rare cases, it can be passed from a pregnant mother to her child.** In which case the child will develop warts in his or her throat.
- **Most people who have genital HPV don’t know they have it.** There are often no symptoms, and it may pass away on its own without causing any serious health problems.
- **There is no cure for HPV, but there is a vaccine for HPV.**

### How to vaccinate yourself for HPV
HPV vaccines are approved by the U.S. Food and Drug Administration (FDA) and developed by the National Cancer Institute (NCI). The vaccines are safe and effective and can help prevent most genital warts and most cervical cancers. The vaccines are given in series of three shots. Two vaccines (Gardasil and Cervarix) have been shown to protect against most cervical cancers in women. One vaccine (Gardasil) also protects against genital warts and has been shown to protect against cervical cancer in women. The vaccines are recommended for women aged 21-49 years old.

### How to wear yourself for HPV
HPV vaccines offer the greatest health benefits to individuals who receive all three doses before having any type of sexual activity. That’s why HPV vaccination is recommended for girls and boys at age 11 or 12 years. HPV vaccines are also recommended for all teen girls and women through age 26, who did not get all three doses of the vaccine when they were younger.

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Source: [CDC](https://www.cdc.gov/cervical/index.htm)
HPV vaccination page

HPV Vaccine

Pakistan has moved from a low-risk to a moderate-risk country for cervical cancer, with incidence of the disease more than doubling between 2002 and 2008. However, young females often do not know that cervical cancer is preventable and there are two vaccines available in Pakistan for human papillomavirus (HPV), a virus that causes cervical cancer. It is important to note that all women and men will have at some point in their lives. Being vaccinated before exposure to the virus helps protect women against cervical cancer and the precancerous lesions that precede it.

Today, two vaccines - Gardasil and Cervarix - are available in Pakistan to prevent the HPV types that cause most cervical cancers.

Who should get HPV vaccine?

It is recommended that all girls and women ages 9 to 26 get an HPV vaccine to help prevent Neisseria gonorrhoeae (NG), a bacteria that causes epididymitis and may lead to infertility. The vaccine contains four types of HPV: 16 and 18, which cause 70% of cervical cancers. The vaccine makes your body's immune system produce antibodies to these HPV types. The antibodies protect you from getting infected with HPV.

Also boys and men ages 9 to 26 can get the vaccine to prevent genital warts, some cancers of the anus, and to prevent the spread of HPV to women who could potentially become pregnant.

The HPV vaccines are given in a series of three shots. You will get the first shot at 11 or 12 years and then again at 15 or 16 years of age. The third shot should be given at 1 week after the second shot. You will get the second shot after 6 to 12 months and the third shot after 6 to 12 months. The third shot should be given at the same time as other vaccine.

Recommended doses of HPV vaccine:

- Gardasil dosage is a 3-dose series
  - Dose 1: Month
  - Dose 2: 1 month after Dose 1
  - Dose 3: 6 months after Dose 1

Which HPV vaccines are available in Pakistan?

There are two types of HPV vaccine, Gardasil and Cervarix available in Pakistan. They both protect against HPV types 16 and 18, which cause 70% of cervical cancers. The vaccine makes your body's immune system produce antibodies to these HPV types. The antibodies protect you from getting infected with HPV.

- Gardasil
  - Gardasil is produced by Merck & Co., Inc. It protects against four HPV types: 6, 11, 16, and 18. Gardasil is given through a series of three doses, with the first two doses one month apart. Gardasil has been approved for use in females for the prevention of cervical and vulvar cancer, and for the prevention of genital warts caused by HPV types 6 and 11. The vaccine is also approved for use in males for the prevention of genital warts caused by HPV types 6 and 11.

- Cervarix
  - The Cervarix vaccine is produced by GlaxoSmithKline (GSK). It is a bivalent vaccine because it targets two HPV types, 16 and 18. This vaccine is also given in three doses one month apart. Cervarix has been approved for use in females for the prevention of cervical and vulvar cancer, and for the prevention of genital warts caused by HPV types 16 and 18.

Both Gardasil and Cervarix are based on technology developed in part by the National Cancer Institute (NCI) scientists in USA. Neither of these HPV vaccines has been proven to provide complete protection against all HPV types or against all HPV-related diseases, although some evidence suggests that both vaccines might provide partial protection against a few additional HPV types that cause cervical cancer. Overall, the Gardasil vaccine will provide better protection against cervical and vaginal cancers, whereas the Cervarix vaccine will provide better protection against HPV-related diseases.

Do HPV vaccines cure HPV?

HPV vaccines do not cure existing infections, and they do not protect against other types of HPV. HPV vaccines are not recommended for pregnant women.

How safe is the HPV vaccine?

Studies show that both HPV vaccines are safe and effective. Both vaccines have been tested in tens of thousands of people in the United States and many other countries. The vaccines have been shown to be beneficial for women.

- Gardasil
  - Gardasil contains four components: 6B, 11B, 16B, and 18B. These components are not considered to be harmful.
  - Before vaccination, the patient should be advised of the possible side effects.

- Cervarix
  - Cervarix contains two components: 16A and 18A. These components are not considered to be harmful.

- Before vaccination, the patient should be advised of the possible side effects.

Both Gardasil and Cervarix have been shown to be effective in preventing cervical cancer.

Cervical cancer a growing risk in Pakistan

According to the World Health Organization report, the incidence of cervical cancer in 2009 was 15 per 100,000 compared to 10 per 100,000 in 1993. HPV vaccination is considered to be especially beneficial for cervical cancer prevention method in countries without cervical cancer screening programs, like Pakistan.

Cervical Cancer Vaccine

Gardasil and Cervarix are two vaccines that can help prevent HPV infections and cervical cancer. They are both effective in preventing cervical cancer, and while they do not cure existing infections, they can reduce the risk of developing cancer. It is important to note that all women and men can benefit from these vaccines.

Cervarix

The Cervarix vaccine is produced by GlaxoSmithKline (GSK). It is a bivalent vaccine because it targets two HPV types, 16 and 18. This vaccine is also given in three doses one month apart. Cervarix has been approved for use in females for the prevention of cervical and vulvar cancer, and for the prevention of genital warts caused by HPV types 16 and 18. The vaccine is also approved for use in males for the prevention of genital warts caused by HPV types 16 and 18.

HPV vaccine is recommended for adolescents and young adults of both genders. It is recommended for young boys and girls age 11 to 12 years and for young men and women age 13 to 26 years. It is not recommended for those who have already been infected with HPV.

Girls who have received all 3 doses of HPV vaccination should still have regular Pap tests

Because vaccines do not protect against all HPV types that can cause cancer, Pap tests (Pap smears) are still important to detect cervical cancers and precancerous changes.

In addition, Pap tests are critically important for women who have not been vaccinated or who are already infected with HPV.

Some people should not get HPV vaccine or should wait

- Anyone who has ever had a life-threatening allergic reaction to any component of an HPV vaccine or to a previous dose of an HPV vaccine should not get the vaccine. Your doctor will give you a thorough examination before giving you the vaccine.

- Gardasil is not recommended for pregnant women.

- Women who are breastfeeding may get the vaccine.

- People who are mobility 6 when a dose of HPV vaccine is given may still be vaccinated. People with a moderate or severe disease should wait until they are better.

Source: CDC, National Cancer Institute, National Immunization Program, National Cervical Cancer Coalition

© 2012 by Girl Talk
Ask from a doctor page
Questionnaire page

Questionnaire

Now that you have read through all sections of this website, please proceed to the last part of this study and fill out the questionnaire in order to qualify for 100 rupees worth of mobile phone credit.

Thank you so much for your time and effort!
APPENDIX D

QUALITATIVE SALIENT BELIEF QUESTIONNAIRE

Behavioral outcomes

(1) Breast self-exams
   a. What do you see as the advantages of you performing breast self-exams once a month for the next two months?
   b. What do you see as the disadvantages of you performing breast self-exams once a month for the next two months?

(2) Condom use
   a. What do you see as the advantages of you using a condom every time you have vaginal sex?
   b. What do you see as the disadvantages of you using a condom every time you have vaginal sex?

(3) HPV vaccination
   a. What do you see as the advantages of you getting vaccinated for Human Papillomavirus (HPV) once during the next two months?
   b. What do you see as the disadvantages of you getting vaccinated for Human Papillomavirus (HPV) once during the next two months?

Normative referents

(1) Breast Self-exams
   a. When it comes to you performing breast self-exams once a month for the next two months, there might be individuals or groups who would think you should or should not do it.
      i. Please list the individuals or groups who would approve or think you should perform breast self-exams once a month for the next two months.
      ii. Please list the individuals or groups who would disapprove or think you should not perform breast self-exams once a month for the next two months.
   b. Sometimes, when we are not sure what to do, we look to see what others are doing.
      i. Please list the individuals or groups who are most likely to perform breast self-exams once a month for the next two months.
      ii. Please list the individuals or groups who are least likely to perform breast self-exams once a month for the next two months.

(2) Condom Use
   a. When it comes to you using a condom every time you have vaginal sex, there might be individuals or groups who would think you should or should not do it.
      i. Please list the individuals or groups who would approve or think you should use a condom every time you have vaginal sex.
      ii. Please list the individuals or groups who would disapprove or think you should not use a condom every time you have vaginal sex.
b. Sometimes, when we are not sure what to do, we look to see what others are doing.
   i. Please list the individuals or groups who are most likely to use a condom every time they have vaginal sex.
   ii. Please list the individuals or groups who are least likely to use condom every time they have vaginal sex.

(3) HPV vaccination
   a. When it comes to you getting yourself vaccinated for Human Papillomavirus (HPV), there might be individuals or groups who would think you should or should not do it.
      i. Please list the individuals or groups who would approve or think you should get yourself vaccinated for HPV at least once during the next two months.
      ii. Please list the individuals or groups who would disapprove or think you should not get yourself vaccinated for HPV at least once during the next two months.
   b. Sometimes, when we are not sure what to do, we look to see what others are doing.
      i. Please list the individuals or groups who are most likely to get themselves vaccinated for HPV at least once during the next two months.
      ii. Please list the individuals or groups who are least likely to get themselves vaccinated for HPV at least once during the next two months.

Control factors

(1) Breast Self-exams
   a. Please list any factors or circumstances that would make it easy or enable you to perform breast self-exams once a month during the next two months.
   b. Please list any factors or circumstances that would make it difficult or prevent you from performing breast self-exams once a month during the next two months.

(2) Condom Use
   a. Please list any factors or circumstances that would make it easy or enable you to use a condom every time you have vaginal sex.
   b. Please list any factors or circumstances that would make it difficult or prevent you from using a condom every time you have vaginal sex.

(3) HPV vaccination
   a. Please list any factors or circumstances that would make it easy or enable you to get yourself vaccinated for HPV once during the next two months.
   b. Please list any factors or circumstances that would make it difficult or prevent you from getting yourself vaccinated for HPV once during the next two months.
APPENDIX E

SURVEY INSTRUMENT FOR THE EXPERIMENT GROUP

Part I

Q2 Please insert the code that was sent to you by e-mail
Q3 1.1. What is your gender?
   □ Female (1)
   □ Male (2)

If Male Is Selected, Then Skip To End of Survey

Q4 1.2. Are you a student?
   □ Yes (1)
   □ No (2)

If No Is Selected, Then Skip To End of Survey

Q5 1.3. What is your marital status?
   □ Married (husband has one wife) (1)
   □ Married (husband has more than one wife) (2)
   □ Single (3)
   □ Divorced/separated (4)
   □ Widowed (5)
   □ Living with intimate partner (6)

Q6 1.4. Have you ever heard of a disease called breast cancer?
   □ Yes (1)
   □ No (2)

Q7 1.5. Have you ever heard of a disease called cervical cancer?
   □ Yes (1)
   □ No (2)

Q8 1.6. Have you ever heard of a human papillomavirus (HPV)?
   □ Yes (1)
   □ No (2)

Q9 1.7. On a scale of 0-10, I feel that ... (click on the scale and slide)
   _____ my knowledge about condom use is (1)
   _____ my knowledge about a vaccine for human papillomavirus (HPV) is (2)
   _____ my knowledge about breast self-exams is (3)

Q10 1.8. Have you been vaccinated for Human Papillomavirus (HPV)?
   □ Yes, I have got all 3 shots (1)
   □ Yes, I have got only 2 shots (2)
   □ Yes, I have got only 1 shot (3)
   □ No (4)
   □ I do not know (5)
Q11 1.9. How often do you have yourself checked by a gynecologist (women's doctor)?
☐ I have never been checked by a gynecologist (1)
☐ Once in every 5 years (2)
☐ Once in every 3 years (3)
☐ Once in every 2 years (4)
☐ At least once a year (5)

Answer: If How often do you have yourself checked by a gynecologist ... I have never been checked by a gynecologist is selected

Q12 1.10. Why haven't you visited a gynecologist (women's doctor) for a check up? Check all that apply
☐ I have not had time (1)
☐ I don't think that it is necessary (2)
☐ I cannot afford it (3)
☐ There is no gynecologist in my area (4)
☐ The waiting lines are too long to get an appointment (5)
☐ I am embarrassed of exposing my private body parts to a doctor (6)
☐ I am afraid to disclose my sexual history to my doctor (7)
☐ My parents would not like it (8)

If What is your marital status? Married (husband has one wife) is selected Or What is your marital status? Married (husband has more than one wife) is selected Or What is your marital status? Living with intimate partner is selected
☐ My husband/partner does not like it (9)
☐ I am afraid of getting bad test results/diagnosis (10)
☐ I am afraid it is painful (11)
☐ I don't think there is anything wrong with me (12)
☐ Other (please specify) (13) ____________________

If I have not had time is selected, then skip to 13. What is your age?
If I don't think that it is necessary is selected, then skip to 13. What is your age?
If I cannot afford it is selected, then skip to 13. What is your age?
If There is no gynecologist in my area is selected, then skip to 13. What is your age?
If The waiting lines are too long is selected, then skip to 13. What is your age?
If I am embarrassed of exposing my private body parts to a doctor is selected, then skip to 13. What is your age?
If I am afraid to disclose my sexual history to my doctor is selected, then skip to 13. What is your age?
If My parents would not like it is selected, then skip to 13. What is your age?
If My husband/partner does not like it is selected, then skip to 13. What is your age?
If I am afraid of getting bad results is selected, then skip to 13. What is your age?
If I am afraid it is painful is selected, then skip to 13. What is your age?
If I am afraid to disclose my sexual history to my doctor is selected, then skip to 13. What is your age?
If Other (please specify) is selected, then skip to 13. What is your age?

Answer: If How often do you have yourself checked by a gynecologist ... Once in every 2 years is selected Or How often do you have yourself checked by a gynecologist ... Once in every 3 years is selected Or How often do you have yourself checked by a gynecologist ... Once in every 5 years is selected

Q13 1.11. Why haven’t you visited a gynecologist for a check up more often? Check all that apply
☐ I have not had time (1)
☐ I don't think that it is necessary (2)
☐ I cannot afford it (3)
☐ There is no gynecologist in my area (4)
☐ The waiting lines are too long to get an appointment (5)
☐ I am embarrassed of exposing my private body parts to a doctor (6)
☐ I am afraid to disclose my sexual history to my doctor (7)
☐ My parents would not like it (8)

If What is your marital status? Married (husband has one wife) is selected Or What is your marital status? Married (husband has more than one wife) is selected Or What is your marital status? Living with intimate partner is selected
- My husband/partner would not like it (9)
- I am afraid of getting bad test results/diagnosis (10)
- I am afraid it is painful (11)
- I don't think there is anything wrong with me (12)
- Other (please specify) (13) ____________________

*Answer If How often do you have yourself checked by a gynecologist ... I have never been checked by a gynecologist Is Not Selected*

Q14 1.12. Have you ever received a PAP-test (smear)?
- Yes (1)
- No (2)
- I don't know (3)
- I don't know what a PAP-test is (4)

Q15 1.13. What is your age?

Q16 1.14. When it comes to matters of health, I want to DO

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Q17 1.15. What is your ethnicity?
- Punjabi (1)
- Pashtun (2)
- Sindhi (3)
- Seraiki (4)
- Muhajir (5)
- Baloch (6)
- Other (please specify) (7) ____________________

Q18 1.16. What is your monthly income (combined income of everybody in your household)?
- Less than 10,000 Rs (1)
- 10,000-29,999 Rs (2)
- 30,000-49,999 Rs (3)
- 50,000-99,999 Rs (4)
- 100,000-199,999 Rs (5)
- More than 200,000 Rs (6)

Q19 1.17. What is your sexual orientation?
- Heterosexual (I am attracted to people from the opposite gender) (1)
- Bisexual (I am attracted to people from both genders) (2)
- Gay/Lesbian (I am attracted to people from the same gender as me) (3)

Q20 1.18. What is your year in college/university?
- 1st year (1)
- Sophomore (2)
- Junior (3)
- Senior (4)
- Master's student (5)
- Doctoral student (6)
- Other (please specify) (7) ____________________

Q21 1.19. What is your major in school?

Q22 1.20. What is your employment status?
- Employed full time (1)
- Employed part time (2)
- Housewife (3)
- Not employed (4)

Q23 1.21. Where do you live?
- I live alone in a university dorm (1)
- I share a room in a university dorm (2)

If 3. What is your marital status? Married (husband has one wife) Is Selected Or 3. What is your marital status? Married (husband has more than one wife) Is Selected
- I live with my husband (3)
- I live with my boyfriend (4)
- I live with my parents (5)
- I share an apartment/house with a roommate/friend (6)
- I live alone in an apartment/house (7)
Q24 1.22. How often do you currently perform breast self-exams?
- Never (1)
- Once a year (2)
- 3-4 times a year (3)
- Once a month (4)
- Twice a month or more (5)

Q25 1.23 How often do you get your breasts checked by a medical professional (doctor/nurse)?
- Never (1)
- Once in 5 years (2)
- Once in 3 years (3)
- Once a year (4)
- 3-4 times a year or more (5)

Q26 1.24. How many sexual partners have you had?
- None (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6-10 (7)
- More than 10 (8)

Answer If How many sexual partners have you had? None Is Not Selected

Q27 1.25. When you have vaginal sex, how often do you use a condom?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q28 1.26. Have you ever been diagnosed with a sexually transmitted infection?
- Yes (1)
- No (2)

Q29 1.27. Do you have a mobile phone?
- Yes (1)
- No (2)

Answer If Do you have a mobile phone? Yes Is Selected

Q30 1.28 For what purpose(s) do you use your mobile phone? (Check all that apply)
- Calling (1)
- Texting (SMS) (2)
- Data services (Internet) (3)
- Apps (4)

Q31 1.29. Do you have a personal computer with internet access?
- Yes (1)
- No (2)

Q32 1.30. Thinking about all the types of information, news and other activities you can do online related to health and medical issues, about how often do you go online and do something related to health?
Q33 1.31. When it comes to matters of health, I want to BE

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<td></td>
</tr>
<tr>
<td>Pakistani cities</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>like most unmarried</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>young females in Pakistani cities</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q34  Thank you so much for your answers for part I of this study. You can now access the GirlTalkGlobal website.

IMPORTANT INSTRUCTIONS:
1) Please carefully read all the sections on the website.
2) After you have read the information on the website, please click on the webpage subpage named "Questionnaire" and answer the second part of the questionnaire in order to qualify for the 100 rupees worth of mobile phone credit. Thank you once again!

Now click here to access the website: www.girltalkglobal.com

Once you have opened GirlTalk website, click on the arrow below to close this survey window.

Part II

Q1 Please insert again the code that was sent to you by e-mail

Q2 Which were the main topics covered on the website? (Check all that apply)
- Diabetes prevention (1)
- Condom use (2)
- Fitness and healthy diet (3)
- Cervical cancer and HPV vaccination (4)
- Breast cancer and breast self-exams (5)
- Flu prevention (6)
Q3 2.1. In the next two months...

<table>
<thead>
<tr>
<th></th>
<th>Extremely unlikely (1)</th>
<th>Quite unlikely (2)</th>
<th>Slightly unlikely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly likely (5)</th>
<th>Quite likely (6)</th>
<th>Extremely likely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am willing to get myself vaccinated for human papillomavirus (HPV) (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I intend to get myself vaccinated for HPV (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will get myself vaccinated for HPV (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q4 2.2. For me, getting myself vaccinated for Human Papillomavirus (HPV) in the next two months would be

<table>
<thead>
<tr>
<th></th>
<th>1 (1)</th>
<th>2 (2)</th>
<th>3 (3)</th>
<th>4 (4)</th>
<th>5 (5)</th>
<th>6 (6)</th>
<th>7 (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>unpleasant:pleasant (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>foolish:wise (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>immoral:moral (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bad:good (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>harmful:beneficial (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>useless:useful (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unnecessary:necessary (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>difficult:easy (8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q5 2.3. Most people who are important to me think I should get myself vaccinated for Human Papillomavirus (HPV) in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q6 2.4. Most people like me (e.g. other female students) will get themselves vaccinated for Human Papillomavirus (HPV) in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q7 2.5. My getting myself vaccinated for human papillomavirus (HPV) in the next two months would be

- Extremely not up to me (1)
- Quite not up to me (2)
- Slightly not up to me (3)
- Neither (4)
- Slightly up to me (5)
<table>
<thead>
<tr>
<th>Question 2.6. If I really wanted to, I could get myself vaccinated for human papillomavirus (HPV) in the next two months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree (1)</td>
</tr>
<tr>
<td>Quite Disagree (2)</td>
</tr>
<tr>
<td>Slightly Disagree (3)</td>
</tr>
<tr>
<td>Neither Agree nor Disagree (4)</td>
</tr>
<tr>
<td>Slightly Agree (5)</td>
</tr>
<tr>
<td>Quite Agree (6)</td>
</tr>
<tr>
<td>Strongly Agree (7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 2.7. I think that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Me having pain is (1)</td>
</tr>
<tr>
<td>Me spending a lot of money on vaccines is (2)</td>
</tr>
<tr>
<td>Me getting infected with human papillomavirus (HPV) is (3)</td>
</tr>
<tr>
<td>Me being seen as sexually loose is (4)</td>
</tr>
<tr>
<td>Me getting cervical cancer is (5)</td>
</tr>
<tr>
<td>Me having to put a lot of effort in getting HPV vaccine is (6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 2.8. Getting myself vaccinated for human papillomavirus (HPV) in the next two months ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely Likely (1)</td>
</tr>
<tr>
<td>Quite Likely (2)</td>
</tr>
<tr>
<td>Slightly Likely (3)</td>
</tr>
<tr>
<td>Neither likely or unlikely (4)</td>
</tr>
<tr>
<td>Slightly Unlikely (5)</td>
</tr>
<tr>
<td>Quite Unlikely (6)</td>
</tr>
<tr>
<td>Extremely Unlikely (7)</td>
</tr>
<tr>
<td>will prevent me from getting HPV (1)</td>
</tr>
<tr>
<td>will be painful and will hurt a lot (2)</td>
</tr>
<tr>
<td>will be too expensive (3)</td>
</tr>
<tr>
<td>will make me look sexually loose (4)</td>
</tr>
<tr>
<td>will prevent me from getting cervical cancer (5)</td>
</tr>
<tr>
<td>would require a lot of effort from me (6)</td>
</tr>
</tbody>
</table>
Q11 2.9. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My mother thinks that I should get myself vaccinated for HPV at least once in the next two months (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My female school teachers think that I should get myself vaccinated for HPV at least once in the next two months (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My doctor thinks that I should get myself vaccinated for HPV at least once in the next two months (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My friends think that I should get myself vaccinated for HPV at least once in the next two months (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Religious people in my community think that I should get myself vaccinated for HPV at least once in the next two months (5)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Q12 2.10. To what extent do you believe with the following statements are true:

<table>
<thead>
<tr>
<th></th>
<th>Extremely False (1)</th>
<th>Quite False (2)</th>
<th>Slightly False (3)</th>
<th>Neither true or false (4)</th>
<th>Slightly True (5)</th>
<th>Quite True (6)</th>
<th>Extremely True (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of my female friends will vaccinate themselves for HPV in the next two months (1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Most unmarried young females in Lahore will vaccinate themselves for HPV in the next two months (2)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>My female family members in my age (e.g. sisters, cousins) will vaccinate themselves for HPV in the next two months (3)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Most women in conservative families in Lahore will vaccinate themselves for HPV in the next two months (4)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Q13.2.11. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have health insurance that covers the cost for human papillomavirus (HPV) vaccination (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have spare money that I can use for covering human papillomavirus (HPV) vaccination expenses (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have access to a doctor who provides HPV vaccination (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I have access to information about HPV vaccination (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Q14.2.12. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My having health insurance that covers vaccinations would facilitate my ability to get myself vaccinated for HPV in the next two months (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My having spare money that I can use for covering vaccination expenses would facilitate my ability to get myself vaccinated for HPV in the next two months (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My having access to a doctor who provides HPV vaccination would facilitate my ability to get myself vaccinated for HPV in the next two months (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My having access to information about HPV vaccination would facilitate my ability to get myself vaccinated for HPV in the next two months (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Q15 3.1. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely unlikely (1)</th>
<th>Quite unlikely (2)</th>
<th>Slightly unlikely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly likely (5)</th>
<th>Quite likely (6)</th>
<th>Extremely likely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am willing to use a condom every time when I have vaginal intercourse (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I intend to use a condom every time when I have vaginal intercourse (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will use a condom every time when I have vaginal intercourse (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q16 3.2. For me, if I were to use condoms every time that I have vaginal intercourse, this would be

<table>
<thead>
<tr>
<th>Feeling</th>
<th>1 (1)</th>
<th>2 (2)</th>
<th>3 (3)</th>
<th>4 (4)</th>
<th>5 (5)</th>
<th>6 (6)</th>
<th>7 (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>unpleasant:pleasant (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>foolish:wise (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>immoral:moral (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bad:good (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>harmful:beneficial (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>useless:useful (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unnecessary:necessary (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>difficult:easy (8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q21 3.7. I think that...

<table>
<thead>
<tr>
<th>Event</th>
<th>Not at all bad (0)</th>
<th>Slightly bad (1)</th>
<th>Quite bad (2)</th>
<th>Extremely bad (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Me getting a sexually transmitted infection (STI) is (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Me getting pregnant when I do not want to have a baby is (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Me being seen as religiously or ethically immoral (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Me having less sexual pleasure when having sex is (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Me being worried is (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q17 3.3. Most people who are important to me think I should use a condom every time when having vaginal intercourse
   - Strongly Disagree (1)
   - Quite Disagree (2)
   - Slightly Disagree (3)
   - Neither Agree nor Disagree (4)
   - Slightly Agree (5)
   - Quite Agree (6)
   - Strongly Agree (7)

Q18 3.4. Most people like me (e.g. other female students) will use a condom every time when having vaginal intercourse
   - Strongly Disagree (1)
   - Quite Disagree (2)
   - Slightly Disagree (3)
   - Neither Agree nor Disagree (4)
   - Slightly Agree (5)
   - Quite Agree (6)
   - Strongly Agree (7)

Q19 3.5. My using a condom every time when having vaginal intercourse would be
   - Extremely not up to me (1)
   - Quite not up to me (2)
   - Slightly not up to me (3)
   - Neither (4)
   - Slightly up to me (5)
   - Quite up to me (6)
   - Extremely up to me (7)

Q20 3.6. If I really wanted to, I could use a condom every time when having vaginal intercourse
   - Strongly Disagree (1)
   - Quite Disagree (2)
   - Slightly Disagree (3)
   - Neither Agree nor Disagree (4)
   - Slightly Agree (5)
   - Quite Agree (6)
   - Strongly Agree (7)
Q22 3.8. I believe that my using a condom every time I have vaginal intercourse ...

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely Likely (1)</th>
<th>Quite Likely (2)</th>
<th>Slightly Likely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly Unlikely (5)</th>
<th>Quite Unlikely (6)</th>
<th>Extremely Unlikely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>will protect me from getting a sexually transmitted infection (STI) (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>will help to prevent unwanted pregnancy (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>will make me seem sexually loose (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>will create religious and ethical concerns for me (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>will reduce sexual pleasure (5)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>will make me worry less (6)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Q23 3.9. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My mother thinks that I should use a condom every time I have vaginal intercourse (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>My friends think that I should use a condom every time I have vaginal intercourse (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Female health workers in Pakistan think that I should use a condom every time I have vaginal intercourse (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>My (future) partner thinks that I should use a condom every time I have vaginal intercourse (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Religious people in my community think that I should use a condom every time I have vaginal intercourse (5)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
</tr>
</tbody>
</table>
Q24 3.10. To what extent do you believe that the following statements are true:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely False (1)</th>
<th>Quite False (2)</th>
<th>Slightly False (3)</th>
<th>Neither true or false (4)</th>
<th>Slightly True (5)</th>
<th>Quite True (6)</th>
<th>Extremely True (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of my female friends use a condom every time they have vaginal sex (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Most unmarried young females in Lahore use a condom every time they have vaginal sex (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My mother uses a condom every time she has vaginal sex (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My female family members in my age (sisters, cousins) use a condom every time they have vaginal sex (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Most women in conservative families in Lahore use a condom every time they have vaginal sex (5)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Q25 3.11. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Extremely Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have knowledge about how to use a condom every time when having vaginal sex (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I encounter condom use to be a taboo in my community (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I encounter religious misconceptions about condom use in my community (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>It is likely that I will have a partner who accepts to use a condom every time when having vaginal sex (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I can easily buy condoms if I want to (5)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
**Q26 3.12. To what extent do you agree with the following statements:**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My having knowledge about how to use a condom would enable me to use a condom every time I have vaginal sex (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My encountering condom use to be a taboo in my community would make it difficult for me to use a condom every time I have vaginal sex (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My encountering religious misconceptions about condom use in my community would make it difficult for me to use a condom every time I have vaginal sex (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My having a partner who accepts condom use would enable me to use a condom every time I have vaginal sex (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My having access to buy condoms would enable me to use a condom every time I have vaginal sex (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Q27 4.1. To what extent do you agree with the following statements:**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely unlikely (1)</th>
<th>Quite unlikely (2)</th>
<th>Slightly unlikely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly likely (5)</th>
<th>Quite likely (6)</th>
<th>Extremely likely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am willing perform breast self-exam at least once in a month in the next two months (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I intend to perform breast self-exam at least once in the next two months (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will perform breast self-exam at least once in the next two months (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q28 4.2. For me, performing a breast self-exam at least once in the next two months would be

<table>
<thead>
<tr>
<th></th>
<th>1 (1)</th>
<th>2 (2)</th>
<th>3 (3)</th>
<th>4 (4)</th>
<th>5 (5)</th>
<th>6 (6)</th>
<th>7 (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>unpleasant:pleasant (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>foolish:wise (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>immoral:moral (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>bad:good (4)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>harmful:beneficial (5)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>useless:useful (6)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>unnecessary:necessary (7)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>difficult:easy (8)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q29 4.3. Most people who are important to me think I should perform breast self-exam at least once a month in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q30 4.4. Most people like me (e.g. other female students) will perform breast self-exam at least once a month in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q31 4.5. My performing breast self-examination at least once a month in the next two months would be

- Extremely not up to me (1)
- Quite not up to me (2)
- Slightly not up to me (3)
- Neither (4)
- Slightly up to me (5)
- Quite up to me (6)
- Extremely up to me (7)

Q32 4.6. If I really wanted to, I could perform breast self-examination at least once a month in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)
Q33 4.7a. I think that...

<table>
<thead>
<tr>
<th></th>
<th>Not at all bad (0)</th>
<th>Slightly bad (1)</th>
<th>Quite bad (2)</th>
<th>Extremely bad (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Me detecting breast cancer in an early stage is (1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Me having an uncomfortable feeling is (2)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Me increasing my risk of getting breast cancer is (3)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Q34 4.7b. I think that...

<table>
<thead>
<tr>
<th></th>
<th>Not at all good (0)</th>
<th>Slightly good (1)</th>
<th>Quite good (2)</th>
<th>Extremely good (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Me having a piece of mind is (1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Q35 4.8. I believe that my performing breast self-examination at least once a month in the next two months ...

<table>
<thead>
<tr>
<th></th>
<th>Extremely Likely (1)</th>
<th>Quite Likely (2)</th>
<th>Slightly Likely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly Unlikely (5)</th>
<th>Quite Unlikely (6)</th>
<th>Extremely Unlikely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>will help to detect breast cancer in an early stage (1)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>will give me a piece of mind about my breasts health (2)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>will increase my risk of getting a breast cancer as I may do it wrong or not notice unusual lumps (3)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>will give me an uncomfortable feeling (4)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>will cause unnecessary worrying (5)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>will make me look immoral (6)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
Q36 4.9. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My doctor thinks that I should perform breast self-examination at least once a month in the next two months (1)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My mother thinks that I should perform breast self-examination at least once a month in the next two months (2)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My female school teachers think that I should perform breast self-examination at least once a month in the next two months (3)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My female family members in my age (sisters, cousins) think that I should perform breast self-examination at least once a month in the next two months (4)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>My female friends think that I should perform breast self-examination at least once a month in the next two months (5)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Religious people in my community think that I should perform breast self-examination at least once a month in the next two months (6)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Q37 4.10. To what extent do you believe that the following statements are true:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely False (1)</th>
<th>Quite False (2)</th>
<th>Slightly False (3)</th>
<th>Neither true or false (4)</th>
<th>Slightly True (5)</th>
<th>Quite True (6)</th>
<th>Extremely True (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of my female friends will perform monthly breast self-exams in the next two months (1)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>My mother will perform monthly breast self-exams in the next two months (2)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>My female family members in my age (sisters, cousins) will perform monthly breast self-exams in the next two months (3)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>My female teachers will perform monthly breast self-exams in the next two months (4)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Most women from conservative families in Lahore will perform monthly breast self-exams in the next two months (5)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Q38 4.11. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have knowledge about how to perform breast self-exams (1)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I encounter unsupportive attitudes toward breast self-exams from my community members (2)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I feel lazy when it becomes to preventive health behaviors (3)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>I have access to private space at my home (4)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Q39 4.12. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My having knowledge about how to perform breast self-exams would enable me to perform monthly breast self-exams in the next two months (1)</td>
<td>○</td>
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<tr>
<td>My encountering unsupportive attitudes toward breast self-exams from my community members would make it difficult for me to perform monthly breast self-exams in the next two months (2)</td>
<td>○</td>
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<tr>
<td>My being lazy about preventive health behaviors would make it difficult for me to perform monthly breast self-exams in the next two months (3)</td>
<td>○</td>
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<td>My having private space at home would enable me to perform monthly breast self-exams in the next two months (4)</td>
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</tbody>
</table>

Q40 1.32. Do you currently live in Pakistan?

☐ Yes (1)
☐ No (2)

Q41 1.33. Have you lived abroad for more than a year in last 10 years?

☐ Yes (1)
☐ No (2)

Q42 1.34. What religion do you associate yourself with the most?

☐ Islam (1)
☐ Catholic Christianity (2)
☐ Protestant Christianity (3)
☐ Orthodox Christianity (4)
☐ Hinduism (5)
☐ Judaism (6)
☐ Buddhism (7)
☐ Nature Religions (8)
☐ Other (9)__________________________
☐ I consider myself to be an atheist (10)

Q43 1.35. How often do you attend religious services?

☐ Regularly (1)
☐ Occasionally (2)
☐ Never (3)
Q44 1.36. How important is religion in your life?
- Extremely Important (1)
- Quite Important (2)
- Slightly Important (3)
- Neither Important nor Unimportant (4)
- Slightly Unimportant (5)
- Quite Unimportant (6)
- Extremely unimportant (7)

Q45 1.7b. On a scale of 0-10, I feel that ...
- my knowledge about condom use is (1)
- my knowledge about a vaccine for human papillomavirus (HPV) is (2)
- my knowledge about breast self-exams is (3)

Q46 7.1. Do you think there is a need for a website such as GirlTalk among Pakistani girls?
- Yes (please explain why) (1) ____________________
- No (please explain why) (2) ____________________

Q47 1. For which mobile phone card would you like to get 100 PKR credit?
- Mobilink Jazz (1)
- Ufone prepaid card (2)
- Warid Telecom prepaid card (3)
- Telenor Prepaid / Djuice (4)
- Zong (5)
- Other (please specify) (6) ____________________
- I do not want calling card credit (7)
APPENDIX F

SURVEY INSTRUMENT FOR THE CONTROL GROUP

Q2 Please insert the code that was sent to you by e-mail

Q3 1.1. What is your gender?
☐ Female (1)
☐ Male (2)

If Male Is Selected, Then Skip To End of Survey

Q4 1.2. Are you a student?
☐ Yes (1)
☐ No (2)

If No Is Selected, Then Skip To End of Survey

Q5 1.3. What is your marital status?
☐ Single (1)
☐ Married (husband has one wife) (2)
☐ Married (husband has more than one wife) (3)
☐ Divorced/separated (4)
☐ Widowed (5)
☐ Living with intimate partner (6)

Q6 1.4. Have you ever heard of a disease called breast cancer?
☐ Yes (1)
☐ No (2)

Q7 1.5. Have you ever heard of a disease called cervical cancer?
☐ Yes (1)
☐ No (2)

Q8 1.6. Have you ever heard of a human papillomavirus (HPV)?
☐ Yes (1)
☐ No (2)

Q9 1.7. On a scale of 0-10, I feel that ... (click on the scale and slide)
☐ my knowledge about condom use is (1)
☐ my knowledge about a vaccine for human papillomavirus (HPV) is (2)
☐ my knowledge about breast self-exams is (3)

Q10 1.8. Have you been vaccinated for Human Papillomavirus (HPV)?
☐ Yes, I have got all 3 shots (1)
☐ Yes, I have got only 2 shots (2)
☐ Yes, I have got only 1 shot (3)
☐ No (4)
☐ I don't know (5)
Q11 1.9. How often do you have yourself checked by a gynecologist (women's doctor)?
☐ I have never been checked by a gynecologist (1)
☐ Once in every 5 years (2)
☐ Once in every 3 years (3)
☐ Once in every 2 years (4)
☐ At least once a year (5)

Answer If 9. How often do you have yourself checked by a gynecologist (women's doctor)... I have never been checked by a gynecologist Is Selected

Q12 1.10. Why haven't you visited a gynecologist (women's doctor) for a check up? Check all that apply
☐ I have not had time (1)
☐ I don't think that it is necessary (2)
☐ I cannot afford it (3)
☐ There is no gynecologist in my area (4)
☐ The waiting times are too long to get an appointment (5)
☐ I am embarrassed of exposing my private body parts to a doctor (6)
☐ I am afraid to disclose my sexual history to my doctor (7)
☐ My parents would not like it (8)

If 3. What is your marital status? Married (husband has one wife) Is Selected Or 3. What is your marital status? Married (husband has more than one wife) Is Selected Or 3. What is your marital status? Living with intimate partner Is Selected
☐ My husband/partner does not like it (9)
☐ I am afraid of getting bad test results/diagnosis (10)
☐ I am afraid it is painful (11)
☐ I don't think there is anything wrong with me (12)
☐ Other (please specify) (13) ____________________

If I have not had time Is Selected, Then Skip To 13. What is your age? If I don't think that it is ne... Is Selected, Then Skip To 13. What is your age? If I cannot afford it Is Selected, Then Skip To 13. What is your age? If There is no gynecologist in... Is Selected, Then Skip To 13. What is your age? If The waiting times are too l... Is Selected, Then Skip To 13. What is your age? If I am embarrassed of exposin... Is Selected, Then Skip To 13. What is your age? If I am afraid to disclose my ... Is Selected, Then Skip To 13. What is your age? If My parents would not like it Is Selected, Then Skip To 13. What is your age? If My husband/partner does not... Is Selected, Then Skip To 13. What is your age? If I am afraid of getting bad ... Is Selected, Then Skip To 13. What is your age? If I am afraid it is painful Is Selected, Then Skip To 13. What is your age? If I don't think there is anyt... Is Selected, Then Skip To 13. What is your age? If Other (please specify) Is Selected, Then Skip To 13. What is your age?

Answer If 9. How often do you have yourself checked by a gynecologist... Once in every 2 years Is Selected Or 9. How often do you have yourself checked by a gynecologist... Once in every 3 years Is Selected Or 9. How often do you have yourself checked by a gynecologist... Once in every 5 years Is Selected

Q13 1.11. Why haven't you visited a gynecologist (women's doctor) for a check up more often? Check all that apply
☐ I have not had time (1)
☐ I don't think that it is necessary (2)
☐ I cannot afford it (3)
☐ There is no gynecologist in my area (4)
☐ The waiting times are too long to get an appointment (5)
☐ I am embarrassed of exposing my private body parts to a doctor (6)
☐ I am afraid to disclose my sexual history to my doctor (7)
☐ My parents would not like it (8)
☐ My husband/partner would not like it (9)
☐ I am afraid of getting bad test results/diagnosis (10)
☐ I am afraid it is painful (11)
I don't think there is anything wrong with me (12)
Other (please specify) (13)

Answer If 9. How often do you have yourself checked by a gynecologist... I have never been checked by a gynecologist Is Not Selected

Q14 1.12. Have you ever received a PAP-test (smear)?
☐ Yes (1)
☐ No (2)
☐ I don't know (3)
☐ I don't know what a PAP-test is (4)

Q15 1.13. What is your age?

Q16 1.14. When it comes to matters of health, I want to DO

<table>
<thead>
<tr>
<th>What my female friends think I should do. (1)</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither Agree nor Disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>What my doctor thinks I should do. (2)</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>What my mother thinks I should do. (3)</td>
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<tr>
<td>What my female teachers think I should do. (4)</td>
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<tr>
<td>What my female family members in my age (sisters, cousins) think I should do. (5)</td>
<td>☐</td>
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<td>What religious people in my community think I should do. (6)</td>
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<tr>
<td>What female health workers think I should do. (7)</td>
<td>☐</td>
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<tr>
<td>What my (future) partner thinks I should do. (8)</td>
<td>☐</td>
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</table>

Q17 1.15. What is your ethnicity?
☐ Punjabi (1)
☐ Pashtun (2)
☐ Sindhi (3)
☐ Seraiki (4)
☐ Muhajir (5)
☐ Baloch (6)
☐ Other (please specify) (7) ____________________
Q18 1.16. What is your monthly income (combined income of everybody in your household)?
☐ Less than 10,000 Rs (1)
☐ 10,000-29,999 Rs (2)
☐ 30,000-49,999 Rs (3)
☐ 50,000-99,999 Rs (4)
☐ 100,000-199,999 Rs (5)
☐ More than 200,000 Rs (6)

Q19 1.17. What is your sexual orientation?
☐ Heterosexual (I am attracted to people from the opposite gender) (1)
☐ Bisexual (I am attracted to people from both genders) (2)
☐ Gay/Lesbian (I am attracted to people from the same gender as me) (3)

Q20 1.18. What is your year in college/university?
☐ 1st year (1)
☐ Sophomore (2)
☐ Junior (3)
☐ Senior (4)
☐ Master's student (5)
☐ Doctoral student (6)
☐ Other (please specify) (7) ____________________

Q21 1.19. What is your major in school?

Q22 1.20. What is your employment status?
☐ Employed full time (1)
☐ Employed part time (2)
☐ Housewife (3)
☐ Not employed (4)

Q23 1.21. Where do you live?
☐ I live alone in a university dorm (1)
☐ I share a room in a university dorm (2)

If 3. What is your marital status? Married (husband has one wife) Is Selected
☐ I live with my husband (3)
☐ I live with my boyfriend (4)
☐ I live with my parents (5)
☐ I share an apartment/house with a roommate/friend (6)
☐ I live alone in an apartment/house (7)

Q24 1.22. How often do you currently perform breast self-exams?
☐ Never (1)
☐ Once a year (2)
☐ 3-4 times a year (3)
☐ Once a month (4)
☐ Twice a month or more (5)

Q25 1.23. How often do you get your breasts checked by a medical professional (doctor/nurse)?
☐ Never (1)
☐ Once in 5 years (2)
☐ Once in 3 years (3)
☐ Once a year (4)
☐ 3-4 times a year or more (5)
Q26 1.24. How many sexual partners have you had?
- None (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6-10 (7)
- More than 10 (8)

Answer If 22. How many sexual partners have you had? None Is Not Selected

Q27 1.25. When you have vaginal sex, how often do you use a condom?
- Never (1)
- Rarely (2)
- Sometimes (4)
- Most of the time (5)
- Always (6)

Q28 1.26. Have you ever been diagnosed with a sexually transmitted infection?
- Yes (1)
- No (2)

Q29 1.27. Do you have a mobile phone?
- Yes (1)
- No (2)

Answer If 25. Do you have a mobile phone? Yes Is Selected

Q30 1.28. For what purpose(s) do you use your mobile phone? (Check all that apply)
- Calling (1)
- Texting (SMS) (2)
- Data services (Internet) (3)
- Apps (4)

Q31 1.29. Do you have a personal computer with internet access?
- Yes (1)
- No (2)

Q32 1.30. Thinking about all the types of information, news and other activities you can do online related to health and medical issues, about how often do you go online and do something related to health?
- Several times a day (1)
- About once a day (2)
- About once a week (3)
- 1-2 times a month (4)
- Less than once a month (5)
- Never (6)
Q33 1.31. When it comes to matters of health, I want to be

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither Agree nor Disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
<th>Not applicable (8)</th>
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<tbody>
<tr>
<td>like my female friends (1)</td>
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<td>like my mother (2)</td>
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<td>like my female family members in my age (e.g. sisters, cousins) (3)</td>
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<td>like my female teachers (4)</td>
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<td>like most women from conservative families in Pakistani cities (5)</td>
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<td>like most unmarried young females in Pakistani cities (6)</td>
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Q34 2.1. In the next two months...

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<thead>
<tr>
<th></th>
<th>Extremely unlikely (1)</th>
<th>Quite unlikely (2)</th>
<th>Slightly unlikely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly likely (5)</th>
<th>Quite likely (6)</th>
<th>Extremely likely (7)</th>
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<tbody>
<tr>
<td>I am willing to get myself vaccinated for human papillomavirus (HPV) (1)</td>
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<td>I intend to get myself vaccinated for HPV (2)</td>
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<td>I will get myself vaccinated for HPV (3)</td>
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Q35 2.2. For me, getting myself vaccinated for Human Papillomavirus (HPV) in the next two months would be

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<tr>
<th></th>
<th>1 (1)</th>
<th>2 (2)</th>
<th>3 (3)</th>
<th>4 (4)</th>
<th>5 (5)</th>
<th>6 (6)</th>
<th>7 (7)</th>
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<tr>
<td>unpleasant:pleasant (1)</td>
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<td>foolish:wise (2)</td>
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<td>immoral:moral (3)</td>
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<td>bad:good (4)</td>
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<td>harmful:beneficial (5)</td>
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<td>useless:useful (6)</td>
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<td>unnecessary:necessary (7)</td>
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<td>difficult:easy (8)</td>
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</table>
Q36 2.3. Most people who are important to me think I should get myself vaccinated for Human Papillomavirus (HPV) in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q37 2.4. Most people like me (e.g. other female students) will get themselves vaccinated for Human Papillomavirus (HPV) in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q38 2.5. My getting myself vaccinated for human papillomavirus (HPV) in the next two months would be

- Extremely not up to me (1)
- Quite not up to me (2)
- Slightly not up to me (3)
- Neither (4)
- Slightly up to me (5)
- Quite up to me (6)
- Extremely up to me (7)

Q39 2.6. If I really wanted to, I could get myself vaccinated for human papillomavirus (HPV) in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q40 2.7. I think that...

<table>
<thead>
<tr>
<th></th>
<th>Not at all bad (0)</th>
<th>Slightly bad (1)</th>
<th>Quite bad (2)</th>
<th>Extremely bad (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Me having pain is (1)</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Me spending a lot of money on vaccines is (2)</td>
<td>☐</td>
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<tr>
<td>Me getting infected with human papillomavirus (HPV) is (3)</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Me being seen as sexually loose is (4)</td>
<td>☐</td>
<td>☐</td>
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<td>Me getting cervical cancer is (5)</td>
<td>☐</td>
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<tr>
<td>Me having to put a lot of effort in getting HPV vaccine is (6)</td>
<td>☐</td>
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</table>
Q41 2.8. Getting myself vaccinated for human papillomavirus (HPV) in the next two months ...

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely Likely (1)</th>
<th>Quite Likely (2)</th>
<th>Slightly Likely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly Unlikely (5)</th>
<th>Quite Unlikely (6)</th>
<th>Extremely Unlikely (7)</th>
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</thead>
<tbody>
<tr>
<td>will prevent me from getting HPV</td>
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<td>will be painful and will hurt a lot</td>
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<td>will make me look sexually loose</td>
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<td>would require a lot of effort from me</td>
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</table>

Q42 10. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My mother thinks that I should get myself vaccinated for HPV at least once in the next two months (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My female school teachers think that I should get myself vaccinated for HPV at least once in the next two months (2)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My doctor thinks that I should get myself vaccinated for HPV at least once in the next two months (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My friends think that I should get myself vaccinated for HPV at least once in the next two months (4)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religious people in my community think that I should get myself vaccinated for HPV at least once in the next two months (5)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q43 2.10. To what extent do you believe with the following statements are true:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely False (1)</th>
<th>Quite False (2)</th>
<th>Slightly False (3)</th>
<th>Neither true or false (4)</th>
<th>Slightly True (5)</th>
<th>Quite True (6)</th>
<th>Extremely True (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of my female friends will vaccinate themselves for HPV in the next two months (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Most unmarried young females in Lahore will vaccinate themselves for HPV in the next two months (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My female family members in my age (e.g. sisters, cousins) will vaccinate themselves for HPV in the next two months (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Most women in conservative families in Lahore will vaccinate themselves for HPV in the next two months (4)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q44 2.11. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have health insurance that covers the cost for human papillomavirus (HPV) vaccination (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I have spare money that I can use for covering human papillomavirus (HPV) vaccination expenses (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I have access to a doctor who provides HPV vaccination (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I have access to information about HPV vaccination (4)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Q45 2.12. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My having health insurance that covers vaccinations would facilitate my ability to get myself vaccinated for HPV in the next two months (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My having spare money that I can use for covering vaccination expenses would facilitate my ability to get myself vaccinated for HPV in the next two months (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My having access to a doctor who provides HPV vaccination would facilitate my ability to get myself vaccinated for HPV in the next two months (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My having access to information about HPV vaccination would facilitate my ability to get myself vaccinated for HPV in the next two months (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q46 3.1. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely unlikely (1)</th>
<th>Quite unlikely (2)</th>
<th>Slightly unlikely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly likely (5)</th>
<th>Quite likely (6)</th>
<th>Extremely likely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am willing to use a condom every time when I have vaginal intercourse (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I intend to use a condom every time when I have vaginal intercourse (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will use a condom every time when I have vaginal intercourse (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q47 3.2. For me, if I were to use condoms every time that I have vaginal intercourse, this would be

<table>
<thead>
<tr>
<th></th>
<th>1 (1)</th>
<th>2 (2)</th>
<th>3 (3)</th>
<th>4 (4)</th>
<th>5 (5)</th>
<th>6 (6)</th>
<th>7 (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>unpleasant:pleasant (1)</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>foolish:wise (2)</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>immoral:moral (3)</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>bad:good (4)</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>harmful:beneficial (5)</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>useless:useful (6)</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>unnecessary:necessary (7)</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>difficult:easy (8)</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
</tbody>
</table>

Q48 3.3. Most people who are important to me think I should use a condom every time when having vaginal intercourse

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q49 3.4. Most people like me (e.g. other female students) will use a condom every time when having vaginal intercourse

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q50 3.5. My using a condom every time when having vaginal intercourse would be

- Extremely not up to me (1)
- Quite not up to me (2)
- Slightly not up to me (3)
- Neither (4)
- Slightly up to me (5)
- Quite up to me (6)
- Extremely up to me (7)

Q51 3.6. If I really wanted to, I could use a condom every time when having vaginal intercourse

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)
Q52 3.7. I think that...

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Me getting a sexually transmitted infection (STI) is (1)</td>
</tr>
<tr>
<td>Me getting pregnant when I do not want to have a baby is (2)</td>
</tr>
<tr>
<td>Me being seen as religiously or ethically immoral (3)</td>
</tr>
<tr>
<td>Me having less sexual pleasure when having sex is (4)</td>
</tr>
<tr>
<td>Me being worried is (5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not at all bad (0)</th>
<th>Slightly bad (1)</th>
<th>Quite bad (2)</th>
<th>Extremely bad (3)</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Q53 3.8. I believe that my using a condom every time I have vaginal intercourse ...

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>will protect me from getting a sexually transmitted infection (STI) (1)</td>
</tr>
<tr>
<td>will help to prevent unwanted pregnancy (2)</td>
</tr>
<tr>
<td>will make me seem sexually loose (3)</td>
</tr>
<tr>
<td>will create religious and ethical concerns for me (4)</td>
</tr>
<tr>
<td>will reduce sexual pleasure (5)</td>
</tr>
<tr>
<td>will make me worry less (6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extremely Likely (1)</th>
<th>Quite Likely (2)</th>
<th>Slightly Likely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly Unlikely (5)</th>
<th>Quite Unlikely (6)</th>
<th>Extremely Unlikely (7)</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>
Q54 3.9. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My mother thinks that I should use a condom every time I have vaginal intercourse (1)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My friends think that I should use a condom every time I have vaginal intercourse (2)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Female health workers in Pakistan think that I should use a condom every time I have vaginal intercourse (3)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>My (future) partner thinks that I should use a condom every time I have vaginal intercourse (4)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Religious people in my community think that I should use a condom every time I have vaginal intercourse (5)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Q55 3.10. To what extent do you believe that the following statements are true:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Extremely False (1)</th>
<th>Quite False (2)</th>
<th>Slightly False (3)</th>
<th>Neither true or false (4)</th>
<th>Slightly True (5)</th>
<th>Quite True (6)</th>
<th>Extremely True (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of my female friends use a condom every time they have vaginal sex (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most unmarried young females in Lahore use a condom every time they have vaginal sex (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My mother uses a condom every time she has vaginal sex (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My female family members in my age (sisters, cousins) use a condom every time they have vaginal sex (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most women in conservative families in Lahore use a condom every time they have vaginal sex (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q56 3.11. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Extremely Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Extremely Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have knowledge about how to use a condom every time when having vaginal sex (1)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>I encounter condom use to be a taboo in my community (2)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>I encounter religious misconceptions about condom use in my community (3)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>It is likely that I will have a partner who accepts to use a condom every time when having vaginal sex (4)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>I can easily buy condoms if I want to (5)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>

Q57 3.12. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My having knowledge about how to use a condom would enable me to use a condom every time I have vaginal sex (1)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>My encountering condom use to be a taboo in my community would make it difficult for me to use a condom every time I have vaginal sex (2)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>My encountering religious misconceptions about condom use in my community would make it difficult for me to use a condom every time I have vaginal sex (3)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>My having a partner who accepts condom use would enable me to use a condom every time I have vaginal sex (4)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>My having access to buy condoms would enable me to use a condom every time I have vaginal sex (5)</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>
Q58 4.1. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Extremely unlikely (1)</th>
<th>Quite unlikely (2)</th>
<th>Slightly unlikely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly likely (5)</th>
<th>Quite likely (6)</th>
<th>Extremely likely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am willing to perform breast self-exam at least once in a month in the next two months (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I intend to perform breast self-exam at least once in the next two months (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I will perform breast self-exam at least once in the next two months (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q59 4.2. For me, performing a breast self-exam at least once in the next two months would be

<table>
<thead>
<tr>
<th></th>
<th>1 (1)</th>
<th>2 (2)</th>
<th>3 (3)</th>
<th>4 (4)</th>
<th>5 (5)</th>
<th>6 (6)</th>
<th>7 (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>unpleasant:pleasant (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>foolish:wise (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>immoral:moral (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>bad:good (4)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>harmful:beneficial (5)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>useless:useful (6)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>unnecessary:necessary (7)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>difficult:easy (8)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q60 4.3. Most people who are important to me think I should perform breast self-exam at least once a month in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q61 4.4. Most people like me (e.g. other female students) will perform breast self-exam at least once a month in the next two months

- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
Slightly Agree (5)  
Quite Agree (6)  
Strongly Agree (7)

Q62 4.5. My performing breast self-examination at least once a month in the next two months would be
- Extremely not up to me (1)
- Quite not up to me (2)
- Slightly not up to me (3)
- Neither (4)
- Slightly up to me (5)
- Quite up to me (6)
- Extremely up to me (7)

Q63 4.6. If I really wanted to, I could perform breast self-examination at least once a month in the next two months
- Strongly Disagree (1)
- Quite Disagree (2)
- Slightly Disagree (3)
- Neither Agree nor Disagree (4)
- Slightly Agree (5)
- Quite Agree (6)
- Strongly Agree (7)

Q64 4.7a. I think that...

<table>
<thead>
<tr>
<th></th>
<th>Not at all bad (0)</th>
<th>Slightly bad (1)</th>
<th>Quite bad (2)</th>
<th>Extremely bad (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Me detecting breast cancer in an early stage is (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Me having an uncomfortable feeling is (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Me increasing my risk of getting breast cancer is (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q65 4.7b. I think that...

<table>
<thead>
<tr>
<th></th>
<th>Not at all good (0)</th>
<th>Slightly good (1)</th>
<th>Quite good (2)</th>
<th>Extremely good (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Me having a piece of mind is (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Q66 4.8. I believe that my performing breast self-examination at least once a month in the next two months ...

<table>
<thead>
<tr>
<th>Will help to detect breast cancer in an early stage (1)</th>
<th>Extremely Likely (1)</th>
<th>Quite Likely (2)</th>
<th>Slightly Likely (3)</th>
<th>Neither likely or unlikely (4)</th>
<th>Slightly Unlikely (5)</th>
<th>Quite Unlikely (6)</th>
<th>Extremely Unlikely (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will give me piece of mind about my breasts health (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will increase my risk of getting a breast cancer as I may do it wrong or not notice unusual lumps (3)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Will give me an uncomfortable feeling (4)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will cause unnecessary worrying (5)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Will make me look immoral (6)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Q67 4.9. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th>My doctor thinks that I should perform breast self-examination at least once a month in the next two months (1)</th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My mother thinks that I should perform breast self-examination at least once a month in the next two months (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My female school teachers think that I should perform breast self-examination at least once a month in the next two months (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My female family members in my age (sisters, cousins) think that I should perform breast self-examination at least once a month in the next two months (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>My female friends think that I should perform breast self-examination at least once a month in the next two months (5)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Religious people in my community think that I should perform breast self-examination at least once a month in the next two months (6)</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Q68 4.10. To what extent do you believe that the following statements are true:

<table>
<thead>
<tr>
<th></th>
<th>Extremel y False (1)</th>
<th>Quite False (2)</th>
<th>Slightly False (3)</th>
<th>Neither true or false (4)</th>
<th>Slightly True (5)</th>
<th>Quite True (6)</th>
<th>Extremel y True (7)</th>
<th>Not applicable (8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of my female friends will perform monthly breast self-exams in the next two months (1)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My mother will perform monthly breast self-exams in the next two months (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My female family members in my age (sisters, cousins) will perform monthly breast self-exams in the next two months (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My female teachers will perform monthly breast self-exams in the next two months (4)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most women from conservative families in Lahore will perform monthly breast self-exams in the next two months (5)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q69 4.11. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have knowledge about how to perform breast self-exams (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I encounter unsupportive attitudes toward breast self-exams from my community members (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel lazy when it becomes to preventive health behaviors (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have access to private space at my home (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q70 4.12. To what extent do you agree with the following statements:

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree (1)</th>
<th>Quite Agree (2)</th>
<th>Slightly Agree (3)</th>
<th>Neither agree or disagree (4)</th>
<th>Slightly Disagree (5)</th>
<th>Quite Disagree (6)</th>
<th>Strongly Disagree (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My having knowledge about how to perform breast self-exams would enable me to perform monthly breast self-exams in the next two months (1)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My encountering unsupportive attitudes toward breast self-exams from my community members would make it difficult for me to perform monthly breast self-exams in the next two months (2)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My being lazy about preventive health behaviors would make it difficult for me to perform monthly breast self-exams in the next two months (3)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My having private space at home would enable me to perform monthly breast self-exams in the next two months (4)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Q71 1.32. Do you currently live in Pakistan?
☐ Yes (1)
☐ No (2)

Q72 1.33. Have you lived abroad for more than a year in last 10 years?
☐ Yes (1)
☐ No (2)

Q73 1.34. What religion do you associate yourself with the most?
☐ Islam (1)
☐ Catholic Christianity (2)
☐ Protestant Christianity (3)
☐ Orthodox Christianity (4)
☐ Hinduism (5)
☐ Judaism (6)
☐ Buddhism (7)
☐ Nature Religions (8)
☐ Other (9) ____________________
☐ I consider myself to be an atheist (10)

Q74 1.35. How often do you attend religious services?
☐ Regularly (1)
☐ Occasionally (2)
☐ Never (3)
Q75 1.36. How important is religion in your life?
- Extremely Important (1)
- Quite Important (2)
- Slightly Important (3)
- Neither Important nor Unimportant (4)
- Slightly Unimportant (5)
- Quite Unimportant (6)
- Extremely unimportant (7)

Q76 5.1. How likely would you use in the future a sexual health and female cancer prevention information website designed especially for Pakistani young females?
- Extremely Unlikely (1)
- Quite Unlikely (2)
- Slightly Unlikely (3)
- Undecided (4)
- Slightly Likely (5)
- Quite Likely (6)
- Extremely Likely (7)

Q77 5.2. How likely would you ask advice about sexual health or female cancer prevention from an online doctor?
- Extremely Unlikely (1)
- Quite Unlikely (2)
- Slightly Unlikely (3)
- Undecided (4)
- Slightly Likely (5)
- Quite Likely (6)
- Extremely Likely (7)

Q78 6. For which mobile phone card would you like to get 100 PKR credit?
- Mobilink Jazz (1)
- Ufone prepaid card (2)
- Warid Telecom prepaid card (3)
- Telenor Prepaid / Djuice (4)
- Zong (5)
- Other (6)
- I do not want calling card credit (7)

Q79 This is the end of the study. Thank you so much for your participation!
If you selected your preferred mobile phone card in a previous question, you will receive an e-mail with a code for 100 rupees worth of mobile phone credit within two weeks.
Your survey answers will not be linked to your e-mail address.
Thank you once again!
Click on the right arrow below to finish the survey.
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(269) StataCorp. (2011). *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP.


BIOGRAPHICAL SKETCH

Mariliis Vahe

Mariliis Vahe was born in Estonia. In 2003, she earned a Bachelor of Arts degree in Public Relations and in 2004, a Master of Arts degree in Social Sciences from Tartu University, Estonia. In 2008 she graduated with a Master of Science degree in Media and Communication from Florida State University. Her research interests include health communication, preventive health behaviors and development communication.