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# The Relationship Between Religiosity And Health-Promoting Behaviors Of Pregnant Women At Pregnancy Resource Centers

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THE RELATIONSHIP BETWEEN RELIGIOSITY AND
HEALTH-PROMOTING BEHAVIORS OF PREGNANT WOMEN
AT PREGNANCY RESOURCE CENTERS


by


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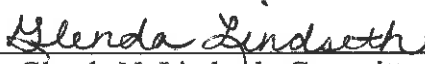Grand Forks, North Dakota
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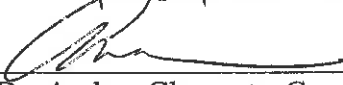
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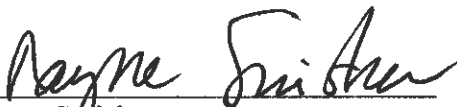
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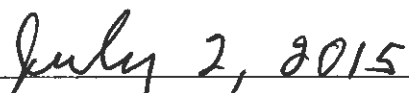
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This dissertation is being submitted by the appointed advisory committee as having met all of the requirements of the School of Graduate Studies at the University of North Dakota and is hereby approved.

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July 2, 2015
Date

PERMISSION

Title            The Relationship Between Religiosity and Health-Promoting Behaviors of
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This dissertation is dedicated to Dr. Theodore Newton,

my inspiration to complete this doctoral education.

I love you Daddy.

ABSTRACT

**Introduction:** While religiosity (e.g. prayer, attending church) has been reported to be related to health behaviors in pregnant women, whether religiosity was related to health-promoting behaviors in pregnant women at Pregnancy Resource Centers (PRC) had not been previously studied. The purpose of this research study was to explore the relationship between religiosity and health-promoting behaviors of pregnant women at PRC. PRC are Christian community-based centers with a focus on meeting needs of pregnant women.

**Methods:** Pender's Health Promotion Model guided this descriptive correlational study. A consecutive sample included pregnant women who knew they were pregnant at least two months, could read/write English, and visited PRC in eastern Pennsylvania. Pregnant women completed a self-report survey that examined religiosity, demographics, pregnancy-related variables, services received at PRC, and health-promoting behaviors. Univariate and multivariate analyses were utilized to determine factors related to health-promoting behaviors and whether religiosity explained any variance above and beyond what was explained by other significant variables.

**Results:** Pregnant women at PRCs reported they "sometimes" or "often" engaged in health-promoting behaviors (M = *2.73*, *SD* = .45). Pregnant women of Hispanic ethnicity reported fewer health-promoting behaviors than non-Hispanic pregnant women ($t$ (84) = 2.13, $p$ < .036). Pregnant women who attended classes at PRC reported more

frequent health-promoting behaviors than those who did not attend classes ($t$ (84) = -2.14, $p$ = .035).  Pregnancy intention was not significantly related to health-promoting behaviors.  In separate multiple linear regressions, organized religiosity, intrinsic religiosity ($\beta$'s = .21), non-organized religiosity, and satisfaction with surrender to God ($\beta$'s = .23) were significant predictors and explained additional variance in health-promoting behaviors above and beyond what Hispanic ethnicity and attending classes at the PRC explained in pregnant women at PRC ($p$ < .05).

**Implications:** While there are variations in levels of religiosity of the pregnant women who attend PRC, higher levels of religiosity did have a significant relationship with more frequent health-promoting behaviors in this sample of pregnant women. Collaboration within public and private organizations, including PRC, to provide holistic care for pregnant women could offer a valuable approach to care of pregnant women, including some women who report unintended pregnancies.

**CHAPTER I**

**INTRODUCTION**

The health decisions made during pregnancy can have lifelong consequences for a woman and her child (Centers for Disease Control and Prevention [CDC], 2013a). Encouraging healthy behaviors for women has been a focus for maternal/child healthcare professionals for many years, yet the results of these efforts remain inconsistent (Harris, Aboueissa, Baugh, Sarton, & Lichter, 2014). In order to promote healthy behaviors during pregnancy, it is necessary to determine the factors that influence a woman's health-promoting behaviors. One factor that has been associated with negative health behaviors in pregnant women is unintended pregnancy, defined as pregnancies that are either mistimed or unwanted (U.S. Department of Health and Human Services, 2013b). Unfortunately, some women who have unintended pregnancies exhibit fewer health-promoting behaviors than women with intended pregnancies (Cheng, Schwarz, Douglas, & Horon, 2009; Chisolm, Cheng, & Terplan, 2014; Dibaba, Fantahun, & Hindin, 2013; Dott, Rasmussen, Hogue, Reefhuis, and the National Birth Defects Prevention Study, 2010; Humbert et al., 2011; Terplan, Cheng, & Chisolm, 2014) increasing their vulnerability to negative health outcomes.

Although women who have unintended pregnancies have several options for pregnancy information and services within the community, some women with unintended pregnancies seek services at community centers that offer faith-based support to pregnant

women who are experiencing an unintended pregnancy, such as Pregnancy Resource Centers (Family Research Council, 2009, www.aPassiontoServe.org). Pregnancy Resource Centers have a Christian religious affiliation and provide services that assist women facing unintended pregnancies, as well as those who report intended pregnancies (Family Research Council, 2009, p.21). The population for this dissertation research included pregnant women who chose to visit Pregnancy Resource Centers.

This chapter will discuss the potential impact of unintended pregnancy on health-promoting behaviors, the previous research that indicates the potential for a pregnant woman's religiosity (religiousness) to positively affect her health-promoting behaviors, the background of unintended pregnancy in the US, a discussion of the history of Pregnancy Resource Centers (the setting for this study), and the potential for vulnerability in pregnant women at Pregnancy Resource Centers (the population of this study). The purpose of this research study will be elucidated and the significance of the study for the nursing profession identified. Finally, the theoretical and philosophical underpinnings will be discussed.

## Unintended Pregnancy and Health Behaviors

For the last several decades, the U.S. Department of Health and Human Services has published the *Healthy People* objectives to identify the national priorities to improve the health of all Americans (U.S. Department of Health and Human Services [DHHS], 2013a). Prevention of unintended pregnancy has been an ongoing goal of the DHHS, evidenced by the Healthy People 2010 and 2020 goal to increase the proportion of intended pregnancies (DHHS, 2013b). However, from 2001 to 2008 there was a slight decrease in the proportion of intended pregnancies from 52% to 49% of all pregnancies in

the United States (Finer & Zolna, 2014). Therefore, when reporting *unintended*

pregnancies from 2008, Finer and Zolna (2014) reported 51% of pregnancies in the

United States were unintended. Since unintended pregnancies continue throughout the

United States, recognition of how these unintended pregnancies impact society is

necessary. Therefore, discussion will follow on the impact of unintended pregnancy on

maternal/child health and the specific Healthy People 2020 initiatives associated with

these outcomes.

When a pregnancy is planned, a woman is focused on recognizing the first signs

of possible pregnancy and seeking to confirm whether she is pregnant or not. However,

women who are not planning a pregnancy may miss the first signs of pregnancy or deny

the possibility that they may be pregnant. Therefore, it is understandable that prenatal

care may not be initiated as early when a woman has an unintended pregnancy as when

the pregnancy is planned. Researchers have reported that women who reported an

unwanted pregnancy or unintended pregnancy had a significantly higher risk of initiating

late or no prenatal care (Cheng et al., 2009; Dibaba et al., 2013; Pulley, Klerman, Tang,

& Baker, 2002) or having inadequate prenatal care (Humbert et al., 2011). In addition,

some women who reported an unintended pregnancy (either mistimed or unwanted) were

significantly more likely to use alcohol (Cheng et al., 2009; Orr, James, & Reiter, 2008;

Kitsantas, Gaffney, & Wu, 2015), illicit drugs (Dott et al., 2010; Orr et al., 2008; Than et

al., 2005), or tobacco (Chisolm et al, 2014; Dott et al., 2010; Orr et al., 2008; Terplan et

al., 2014), and less likely to take vitamins (Dott et al., 2010; Than et al., 2005) than

women with intended pregnancies. As stated, improving maternal health behaviors is a

Healthy People 2020 focus for Maternal, Infant, and Child Health. Objectives include

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increasing the proportion of pregnant women who receive early and adequate prenatal care (objective 10) and increasing abstinence from alcohol, cigarettes, and illicit drugs among pregnant women [objective 11] (DHHS, 2013c).

Researchers have identified that some women with an unintended pregnancy may be at greater risk for poor neonatal outcomes (Shah et al., 2011).  In a systematic review of the literature, Shah et al. (2011) reported that women with unintended pregnancies (including unwanted and mistimed pregnancies) who had a live birth had a significantly increased risk of low birth weight and preterm birth than women with intended pregnancies.  Additional Healthy People 2020 initiatives for Maternal, Infant, and Child Health include reducing the incidence of low birth weight and very low birth weight in babies (objective 8), and reducing preterm births [objective 9] (DHHS, 2013c).  Although not all preterm births or low birth weight babies are associated with an unintended pregnancy, adverse neonatal outcomes, such as preterm birth, cost society at least 26 billion dollars annually (Behrman & Stith Butler, 2006).

In order to continue to advance toward the Healthy People 2020 initiatives, innovative strategies should be considered in an interdisciplinary approach making every effort to improve the health of women and children in the United States.  One potential factor that may impact the health of women and children is a pregnant woman's religiosity.  Discussion will follow on the association between religiosity and health behaviors in pregnant women.

## Religiosity and Health Behaviors

Religiosity, or religiousness, includes "membership and participation in the organizational structures, beliefs, rituals, and other activities related to a religious faith

like Judaism, Hinduism, Islam, or Christianity" (Moberg, 2008, p. 101). People's religious beliefs influence many areas in their lives including the types of foods they eat and how they take care of their bodies (Fonnebo, 1994; Scheib, 2013; Stacey, 2008). Koenig (2012) conducted an exhaustive literature review evaluating research about the health habits of individuals and their level of religiosity/spirituality. The results indicated that as the level of religiosity/spirituality increased, smoking decreased, physical activity was greater, and overall people exhibited healthier behaviors (Koenig, 2012).

Research specific to pregnant women has also been conducted focused on religiosity and health behaviors during pregnancy. Several researchers identified that religiosity was associated with positive maternal self-care during pregnancy (Burdette, Weeks, Hill, & Eberstein, 2012; Gillum & Sullins, 2008; Jesse & Reed, 2004; Mann, McKeown, Bacon, Vesselinov, & Bush, 2007). Increased religiosity has been associated with decreased likelihood of smoking (Burdette et al., 2012; Gillum & Sullins, 2008; Jesse & Reed, 2004; Mann et al., 2007), alcohol use (Kotrla, 2008; Page, Ellison, & Lee, 2009), and marijuana use (Page et al., 2009); and greater likelihood of better maternal nutrition (Burdette et al., 2012) during pregnancy.

Although the mechanism is not clear, religiosity in some women has been associated with positive maternal health behaviors. As stated previously, unintended pregnancy is associated with poor maternal health behaviors placing newborns at risk for poor neonatal outcomes. Research to investigate whether there is an association between religiosity and health-promoting behaviors in women who may be experiencing unintended pregnancy will provide insight into this important phenomenon. If religiosity is associated with health-promoting behaviors of pregnant women at Pregnancy Resource

Centers, future research could focus on individuals who desire to change their level of religiosity and test whether a change in religiosity influences health-promoting behaviors. However, it is as yet unknown whether there is an association between religiosity and health-promoting behaviors in pregnant women with unintended pregnancies.

Understanding more about pregnant women who experience an unintended pregnancy will provide insight into some of the women who visit Pregnancy Resource Centers. In the following section, unintended pregnancies will be further discussed to provide background information regarding women who report unintended pregnancies and the options available to them for resources within the community.

## Background of the Study

In order to establish the context for this research study, an overview of the prevalence of unintended pregnancy in the United States is necessary. In addition, recognition of the impact of unintended pregnancy on women including pregnancy options, resources, and the social, political and financial perspectives that impact pregnancy decisions, is requisite. Lastly, a discussion about the barriers to resources for women with unintended pregnancies is provided as a background for this study.

**Prevalence of Unintended Pregnancy**

Finer and Zolna (2014) evaluated national statistics from 2001 to 2008, to determine the demographics of women who reported unintended pregnancies. Unintended pregnancies varied by age, with the highest percent of unintended pregnancies for women 15-17 years of age (reported at 91% unintended). Women age 18-19 years reported 77% of pregnancies were unintended, and 20-24 year old women reported 64% of pregnancies were unintended (Finer & Zolna, 2014). This percentage

continues to decrease throughout child-bearing years and then increases again after age 35, when 39% of pregnancies are reported as unintended (Finer & Zolna, 2014).

Unintended pregnancies also varied by educational attainment, race, income, marital status, and religion (Finer & Zolna, 2014). Women who were college graduates reported 31% of pregnancies were unintended, while those with less educational attainment reported between 52-54% of pregnancies were unintended (Finer & Zolna, 2014). Black non-Hispanic women had the highest percentage of unintended pregnancies by race and ethnicity at 69% compared to white non-Hispanic (42%) and Hispanic (56%) women. Women who had lower income (55-65%) or were not married (63-82%) reported more unintended pregnancies than those with higher incomes (38%) or who were currently married [31%] (Finer & Zolna, 2014). Lastly, women who reported no religious affiliation had the highest percentage of unintended pregnancy at 59% compared to women with religious affiliations [ranging from 44%- 50%] (Finer & Zolna, 2014).

**Options for Unintended Pregnancy**

Women who have unintended pregnancies have a decision to make regarding that pregnancy. Several options are available to the women including medical or surgical abortion, parenting the child, or releasing the child for adoption. Roe v. Wade legalized abortion in the United States in 1973, providing surgical abortion as a legal option for women who find themselves with an unwanted pregnancy (Finkelman & Urofsky, 2005). In 2000, the U.S. Food and Drug Administration (FDA) approved RU-486 (mifepristone) for early medical abortions (FDA, 2011). Therefore, women with unintended (mistimed

and unwanted) pregnancies have the option of terminating the pregnancy prior to delivering a viable fetus.

In a state by state analysis of unintended pregnancy from 2006 statistics, overall approximately 65-75% of the unintended pregnancies were mistimed, while 25-35% were unwanted (Finer & Kost, 2011). Of those unintended pregnancies, 58% resulted in birth (median proportion), 29% ended with abortion (type unspecified; median proportion), and 13% ended in fetal loss (Finer & Kost, 2011). However, Finer and Zolna (2014) reported that 40% of unintended pregnancies ended in abortion (surgical or medical) in the United States in 2008. In 2007, in the state of Pennsylvania (the location of this study), 70% of unintended pregnancies were mistimed and 30% were unwanted; 55% of the unintended pregnancies ending in live birth, while 33% ended in abortion [type unspecified] (Finer & Kost, 2011).

For women with unintended pregnancies who choose to maintain their pregnancy, an additional decision follows, as they must then decide whether to raise the child or release the child for adoption. Statistics regarding how many women release their infants for adoption in the Unites States are limited. Jones (2008) reported from 1996 to 2002, 1% of children born to never-married women were released for adoption. From 1989 to 1996, less than 1% of babies born to never married women in the United States were released for adoption (Chandra, Abma, Maza, & Bachrach, 1999). It is interesting to note that prior to 1973, nine percent of never married women released their infants for adoption (Jones, 2008).

The final option for women who have unintended pregnancies is that women can decide to parent the baby themselves. Sometimes women decide that although the

pregnancy was unintended initially, they are happy with the pregnancy and change their report of unintended pregnancy to intended pregnancy (Joyce, Kaestner & Korenman, 2000a). However, for some women with unwanted pregnancies, they may continue to have negative feelings even after the birth (Grussu, Quatraro, & Nasta, 2005).

Each of these options above are available to women with unintended pregnancies, however there are sociocultural, political, and financial considerations that influence women's options. In the next section we will discuss these considerations and how these provide context for this dissertation research study.

**Resources for Unintended Pregnancy**

Resources for pregnant women include both government and community resources. Federal resources for pregnant women include; Early Head Start, Healthy Start, Medicaid, and the Special Supplemental Nutrition Program for Women, Infants and Children [WIC] (Taylor & Nies, 2013). Early Head Start is an income-based program that provides prenatal classes, home visits, and support groups to women below federal poverty levels (DHHS, Administration for Women and Children, Office of Head Start, n.d.). Healthy Start programs aim to reduce infant mortality and improve perinatal outcomes through programs focused on minority or income based disparities (DDHS, Health Resources and Service Administration, n.d.). WIC provides supplemental foods, referrals, and nutrition education for low-income pregnant women (U.S. Department of Agriculture, n.d.). According to section 1302 b 1 of the Patient Protection and Affordable Care Act (2010), all qualified health plans must provide essential health coverage that includes both maternity and newborn care, providing pregnant women the opportunity for health care that includes pregnancy coverage.

Since 1970, the National Family Planning Program (Title X) has been providing grants to family planning centers to provide services to low-income or uninsured women. Family planning centers offer contraception services, pregnancy testing and counseling, sexually transmitted infection (STI) treatment and screening, Human Immunodeficiency Virus (HIV) testing, as well as patient education (DHHS, Office of Population Affairs, 2011). Planned Parenthood is one organization that provides low cost family planning services through the funding of Title X grants (DHHS, Office of Population Affairs, 2011). Women who are seeking abortions can obtain information about abortion services or obtain an abortion at family planning centers such as Planned Parenthood. However, Title X funds cannot be used to fund abortions (DHHS, Office of Population Affairs, 2011).

Technology has broadened the possibilities to reach pregnant women through internet sites and text services that provide education on pregnancy and infant care. The National Healthy Mothers Healthy Babies (HMHB) Coalition's mission is to "improve the health and safety of mothers, babies, and families through education and collaborative partnerships" (National Healthy Mothers Healthy Babies Coalition [HMHB], 2013). Text4Baby is one service provided by HMHB that provides free text messages during a woman's pregnancy and during the first year of life (HMHB, 2013). Many internet sites are available for pregnant women including those sponsored by the United States government, such as Womenshealth.gov (DHHS, Office on Women's Health, 2010); pregnancy on the Centers for Disease Control and Prevention (CDC) website (CDC, 2014a); and health topics for women from the U.S. Food and Drug Administration (FDA, 2014).

Community resources are available to pregnant women through a variety of sources including local hospitals, clinics, and religious organizations. Parenting classes, in-home support during pregnancy and early childhood, nutrition counseling, and support in adjusting to pregnancy are some services offered through community programs (Lehigh Valley Health Network, 2014). Faith-based, or religious resources for pregnant women are available at both the national and community level as well. For instance, Catholic Charities USA is a national organization that provides support for social ministries at the local level (Catholic Charities USA, 2013). Pregnancy Resource Centers are another faith-based, community resource that provide education and support to pregnant women including similar services to those described about Catholic Charities above (Family Research Council, 2009).

**Barriers to Resources**

Although there are many resources available to pregnant women, not all pregnant women can obtain or choose to obtain all of the services. Financial barriers may prevent a woman from obtaining services including abortion services or prenatal care. Legislation may impose additional restrictions on the process of obtaining an abortion and hinder a woman from terminating an unintended pregnancy. Cultural and religious influences may impact which resources a woman deems appropriate to use. Political, financial, and cultural barriers to resources for women with unintended pregnancies will be discussed in the following section.

The Patient Protection and Affordable Care Act (2010) required maternal and newborn healthcare coverage for women. However, financial barriers can inhibit a woman with an unintended pregnancy from receiving the healthcare services she desires.

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For instance, not all Americans will obtain healthcare insurance through the Patient Protection and Affordable Care Act (Congressional Budget Office, 2012). It is estimated that by 2022, thirty million people may remain without healthcare coverage in the United States, not including unauthorized immigrants (Congressional Budget Office, 2012). Pregnant women who meet income eligibility will be provided pregnancy care through Medicaid (Centers for Medicare and Medicaid Services, n.d.); however, it remains likely some pregnant women will continue to be uninsured (Dennis et al., 2013). Kitsantas, Gaffney, and Cheema (2012) identified that women in both rural and non-rural areas reported that not having enough money or that healthcare insurance was a barrier to obtaining timely prenatal care.

Cultural and social norms will influence the types and number of services obtained by women with an unintended pregnancy. Some women may delay seeking prenatal care because of cultural or social factors, such as distrust of healthcare professionals. Discrimination or fear of discrimination has diminished the trust in healthcare professionals for some African American women (Peters, Benkert, Templin, & Cassidy-Bushrow, 2014) and may hinder a woman's access to prenatal care. Pregnant women in the Muslim community may delay seeking prenatal care due to concerns about obtaining a same-sex healthcare provider (Padela, Gunter, Killawi, & Heisler, 2012). For some cultures, any care received during pregnancy must be approved by a specific family structure, which may delay the onset of prenatal care and the frequency of that care, including a patriarchal structure for women from Turkey (Tasci-Duran, & Sevil, 2013), and either a matriarchal or patriarchal structure for the Hispanic culture (Darby, 2007).

Cultural and social factors may also limit the desirability of resources available to women with unintended pregnancies. Although abortion is legal in the United States, some cultures, religions, and social circles hold strong beliefs as to the moral and ethical concerns associated with abortion. Women, who may desire an abortion, may face perceived or internalized stigma from those within their social circle (Shellenberg & Tsui, 2012). In a recent study by Shellenberg and Tsui (2012), Hispanic women who reported a religious affiliation were more likely to feel stigma regarding obtaining an abortion than those with no religious affiliation, while both Hispanic and Non-Hispanic black women who were not born in the United States were more likely to report feeling stigma about obtaining an abortion. Some women with no religious affiliation will be less likely to obtain services at a Pregnancy Resource Center due to the religious underpinnings of the center and the overall stance against abortion (Hernandez, 2013).

Women who find themselves in an unintended pregnancy have several resources available to them from a variety of sources, including federal, state, local and community levels. However, due to political, financial, social and cultural factors, not all women will obtain these services. This dissertation research study focused on pregnant women who visited Pregnancy Resource Centers, including some pregnant women who reported their pregnancy as unintended. Further explication of the history of Pregnancy Resource Centers will be discussed below.

**Pregnancy Resource Centers**

Pregnancy Resource Centers are community centers that offer Christian faith-based approaches to the care of pregnant women, some of whom report an unintended pregnancy (Family Research Council, 2009). There are over 2,300 Pregnancy Resource

Centers in the nation (Family Research Council, 2009; Hussey, 2014), each seeing an

average of 300-350 women yearly (Family Research Council, 2009).  Hussey (2013)

studied 510 Pregnancy Resource Centers in the US and reported Pregnancy Resource

Centers are "community-based, volunteer-driven, women-led organizations" (p. 992).

Hussey noted the Pregnancy Resource Centers in her study reported collaborative

relationships with other community agencies including the WIC nutrition programs,

Medicaid, public assistance offices, social services, and child care subsidies (Hussey,

2013).  In addition, Hussey (2013) reported that 59% of the Pregnancy Resource Centers

offered at least limited medical services.

   The first Pregnancy Resource Center was established in 1968 in California

(Family Research Council, 2012), before the historic Roe v. Wade decision legalized

abortion in the United States [*Roe v. Wade,* 1973] (Hussey, 2014).  Following Roe v.

Wade, Pregnancy Resource Centers grew in number under the umbrella of several

organizations, such as Heartbeat International and Care Net, and focused on providing

abortion alternatives to pregnant women (Family Research Council, 2009, 2012).

Pregnancy Resource Centers do not offer abortion services or refer for abortion services

(Family Research Council, 2012; Planned Parenthood 2013).  While women cannot

receive abortion services at Pregnancy Resource Centers, women seeking abortion

services can obtain these services at other family planning clinics (Planned Parenthood,

2013).

   Although some organizations have reported concerns about Pregnancy Resource

Centers' stance regarding abortions (Harrison, 2006; Planned Parenthood, 2013; Stacey,

2013), pregnant women continue to seek services at the Pregnancy Resource Centers in

the United States.  One primary difference between Pregnancy Resource Centers'

community programs and other programs for pregnant women is that Pregnant Resource

Centers are faith-based centers offering both traditional non-religious prenatal and

parenting classes as well as faith-based interventions.  These faith-based interventions are

community focused and often provided by volunteers, who may include faith-community

nurses (also known as parish nurses).  Faith community nursing is a specialized practice

of nursing, "which includes health promotion, education, and coordination of care with a

centrality based on spirituality" (Balint & George, 2015, p. 36).  Faith-based

interventions can also be provided by volunteers from a variety of professional and

nonprofessional backgrounds.  Further information on faith-based interventions is

provided below.

  **Faith-based interventions.**  Faith-based interventions are defined as

interventions which "explicitly incorporate religious language or practice" (Maton, Sto.

Domingo, & Westin, 2013, p. 614).  Within the nursing profession, faith-based

interventions have a strong history dating back to Florence Nightingale when prayers

were read in hospital wards every morning and evening (Nightingale, 1858).  Faith-based

interventions continue to be conducted by faith-community nurses.  More recently the

term *faith-based* gained notoriety in 2001, when President George W. Bush began the

Faith-Based and Community Initiative to collaborate with faith-based organizations in

serving the needs of communities (The White House, 2008).

  While faith-based initiatives invoke a Christian perspective to many, faith-based

initiatives can include any religious affiliation (Iqbal, Zaman, Karandikar, Hendrickse, &

Bowley, 2013; Shirazi, Shirazi, & Bloom, 2013).  However, the faith-based interventions

at the Pregnancy Resource Centers in this dissertation research study have a decidedly Christian focus (Family Research Council, 2009, 2012). Therefore, the implications of religiosity and Pregnancy Resource Centers are discussed below.

**Religiosity and Pregnancy Resource Centers.** While Pregnancy Resource Centers have primarily Christian philosophies, the centers serve women from all religious affiliations and women with no religious affiliation at all (eKyros.com, 2014). Some of the education programs offered have religious underpinnings and others do not, providing options for women who seek services at the centers. Although research has not been conducted on this population to verify reasons women seek services at Pregnancy Resource Centers, some women seeking services at Pregnancy Resource Centers may be seeking religious support based upon the centers' faith-based approach. In fact, Jesse, Schoneboom, and Blanchard, (2007) suggested that some women view pregnancy as a spiritually significant time in their lives and look to spirituality or faith for connection and support.

Pregnant women who visit Pregnancy Resource Centers may report having an unintended pregnancy, which potentially increases their risk of poor neonatal outcomes (Shah et al., 2011). Pregnancy Resource Centers are an additional resource available for pregnant women, especially women with unintended pregnancies. Since Pregnancy Resource Centers have a faith-based approach to services, investigating the relationship between religiosity and health-promoting behaviors in pregnant women at Pregnancy Resource Centers provides a unique opportunity to investigate both women with unintended pregnancies and potentially those with high levels of religiosity. In addition,

studying pregnant women at Pregnancy Resource Centers provides insight into this potentially vulnerable population.

          **Vulnerable populations and women at Pregnancy Resource Centers.** Women at Pregnancy Resource Centers often identify themselves as having an unintended pregnancy (Family Research Council, 2009) and as such they are at greater risk for lack of or delayed prenatal care (Cheng et al., 2009; Dibaba et al., 2013; Orr et al., 2008; Pulley et al., 2002). Pregnant women who do not receive adequate prenatal care are considered to be a vulnerable population (Aday, 2001). Unfortunately, individuals who are vulnerable are "susceptible to poor health and illness" (Shi & Stevens, 2005, p. 16).

          A vulnerability perspective recognizes that socioeconomic and environmental resources influence a person's susceptibility to disease and the consequences of disease (Flaskerud & Winslow, 1998). Flaskerud and Winslow (1998) noted that the relationship between the social and environmental resources available, and the person's exposure to risk factors related to poor health behaviors (such as an unhealthy lifestyle), increased the risk of morbidity and mortality. While there are many resources available to pregnant women, there are cultural, financial, and political factors that influence whether these resources are truly available to an individual woman, as mentioned previously.

          Providing resources to pregnant women is part of the mission of Pregnancy Resource Centers (Family Research Council, 2009, 2012; Hussey, 2013). Services provided at these faith-based community centers are free or low cost, and may be associated with participation in classes, such as parenting classes (Family Research Council, 2009, 2012; Hussey, 2013). For women who choose to visit Pregnancy

Resource Centers, this is a resource that is available and accessible to meet some of their needs during pregnancy.

The Pregnancy Resource Centers provide a variety of services to clients who visit the centers. One program called *Earn While You Learn* provides parenting education, life skills education, bible studies, and other services to families (Heritage House '76, 2014). *Earn While You Learn* includes incentives for participation including free baby items and needed supplies for families. As previously mentioned, additional programs and services are available for pregnant women and families at Pregnancy Resource Centers including referrals to local public health services, information and classes, support programs, or limited medical services (pregnancy tests and limited ultrasounds) to those in need (Family Research Council, 2012; Hussey, 2013).

Some of the pregnant women visiting the Pregnancy Resource Centers in this study may be considered a vulnerable population due to delay or lack of prenatal care, or economic difficulties (Aday, 2001). Therefore, conducting research with these pregnant women at Pregnancy Resource centers provides insight into this vulnerable population. In addition, the lack of research in this area, and the known risks associated with unintended pregnancy, illuminate the importance of identifying factors associated with health-promoting behaviors of pregnant women at Pregnancy Resource Centers.

## Purpose of the Study

The purpose of this study was to explore the relationship between religiosity and health-promoting behaviors of pregnant women at Pregnancy Resource Centers.

**Specific Aims**

The primary aims of this descriptive correlational study were to:

1. Describe the health-promoting behaviors of pregnant women at Pregnancy Resource Centers.

2. Explore the relationship between each of the following sets of variables (religiosity, demographics, pregnancy-related variables, or services obtained at the Pregnancy Resource Center) and health-promoting behaviors of pregnant women at Pregnancy Resource Centers.

3. Determine the percentage of variance that religiosity explains in the health-promoting behaviors, above and beyond what the other variables explain, in pregnant women at Pregnancy Resource Centers.

**Delimitations and Assumptions**

The assumptions of the researcher included that the pregnant women provided truthful responses to the survey questions and that they were the person completing the questionnaire. There was an assumption that although Pregnancy Resource Centers have religious underpinnings, the religiousness of the pregnant women at the centers was unknown and would be diverse. In addition, it was assumed that some women who sought services at the Pregnancy Resource Centers had financial difficulties precipitating their visits to the centers since services are free, and may have no interest in religion or faith-based interventions. Nevertheless, it was an assumption of the researcher that some women who sought services at the Pregnancy Resource Centers did so because they desired spiritual support during pregnancy or desired faith-based interventions.

Lastly, the researcher recognized that in conducting this study, objectivity was vital. Therefore, care was taken to acknowledge personal perspectives on religion and guard to prevent any potential selection bias or bias in interpretation of the study results.

**Significance of the Study**

Although some type of contraception is available to most women (Barot, 2008), unintended pregnancies continue to make up 51% of all pregnancies in the United States (Finer & Zolna, 2014). As mentioned previously, women with unintended pregnancies have an increased risk of low birth weight and preterm births (Shah et al., 2011), incurring both economic and emotional costs to society (Behrman & Stith Butler, 2006; Lasiuk, Comeau, & Newburn-Cook, 2013). Since unintended pregnancies may never be completely eliminated, investigating factors that are related to health-promoting behaviors in women with unintended pregnancies may provide insight for conducting further investigations aimed at identifying factors that may reduce the potential untoward outcomes of these pregnancies.

Faith-based community centers, including Pregnancy Resource Centers, offer a unique setting to investigate health-promoting behaviors, which is an important focus of the Maternal, Infant, and Child health goals of Healthy People 2020 (DHHS, 2013c). Very limited published research was found that has been conducted with women visiting Pregnancy Resource Centers (Hill, 2005; Stark, 2012), and no research investigating religiosity has been reported with pregnant women at Pregnancy Resource Centers. Therefore, this research will provide insight into the relationship between religiosity and health-promoting behaviors of pregnant women at Pregnancy Resource Centers.

In addition, this research has the potential to expand to a much larger population of pregnant women in faith-communities. Research aimed at investigating the relationship between religiosity and health-promoting behavior in pregnancy is not solely applicable to the Pregnancy Resource Center community. Future research would be appropriate in other faith-based centers including the parish nurse community. Faith-community (parish) nurses serve in diverse religious communities across this nation and world, thus increasing the potential impact of this research with vulnerable women (Church Health Center, 2014a, 2014b).

Information gained from this research study will provide an opportunity to learn more about the pregnant women who visited Pregnancy Resource Centers and the relationships between a variety of personal factors, interpersonal factors, and the women's health-promoting behaviors through the use of Pender's Health Promotion Model, a theory for exploring health-promoting behaviors (Pender, Murdaugh, & Parsons, 2002). This information can then be used by nurses, including faith-community nurses, to identify specific areas where additional education or interventions may enhance health-promotion in pregnant women who visit Pregnancy Resource Centers (Balint & George, 2015).

Lastly, additional research using the Health Promotion Model (Pender et al., 2002) provides insight into populations where the use of the model may enhance health promotion. This study investigating pregnant women who visited Pregnancy Resource Centers also included the use of the variable religiosity as a personal factor and an interpersonal influence within the Health Promotion Model. Previous research using the Health Promotion Model investigated the effectiveness of a faith-based intervention for a

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gestational diabetes education program for pregnant women (Mendelson, McNeese-Smith, Koniak-Griffin, Nyamathi, & Lu, 2008); however, little research investigating the relationship of religiosity to health-promotion in pregnant women has been identified (Bond, Jones, Cason, Campbell, & Hall, 2002).  This research study provided information about the theoretical assumptions of the Health Promotion Model, providing additional support to the usefulness of the Health Promotion Model in diverse populations.

## Operational Definitions

*Health-promoting behaviors of pregnant women*: was measured by the 52-item Health-Promoting Lifestyle Profile II (HPLP II).  HPLP II is comprised of six subscales to measure the major components of a healthy lifestyle, including health responsibility, physical activity, nutrition, interpersonal relations, spiritual growth, and stress management (Pender et al., 2002).

*Religiosity*: was defined as organized religiosity, non-organized religiosity, religious commitment, intrinsic religiosity, and religious affiliation.  Religiosity was measured by the Duke University Religion Index (DUREL), a 5-item measure of religious involvement measuring three dimensions of religiosity including organized religiosity, non-organized religiosity, and intrinsic religiosity (Koenig & Bussing, 2010; Koenig, Parkerson, & Meador, 1997).  Religious commitment was measured by the Religious Surrender and Attendance Satisfaction Scale (Cyphers & Clements, 2015).  Religious affiliation was determined by a one-item self-report question.

*Unintended pregnancy*: included mistimed ("occurred earlier than desired"), unwanted pregnancies ["occurred when no children or no more children were desired"] (Santelli et al., 2003, p.94), unsure about intendedness, and those who reported they did

not want to be pregnant but now are glad they are pregnant.  Unintended pregnancy was measured by one modified question from the Pregnancy Risk Assessment Monitoring System (PRAMS) questionnaire (CDC, 2009).

*Pregnancy Resource Centers*: are "predominantly privately funded, community–oriented, faith-based and volunteer-driven" organizations focused on providing "life-affirming" ministry to people facing unintended pregnancies [noted in the report as unplanned pregnancies] (Family Research Council, 2009, p.21).  Due to strong religious convictions Pregnancy Resource Centers promote live births over abortion to women who are carrying an unintended pregnancy.

## Theoretical Framework

**The Health Promotion Model**

The Health Promotion Model (HPM) is the theoretical model that framed this research study.  The HPM is considered a middle-range theory based upon expectancy-value theory and social cognitive theory and provides a holistic, multidimensional framework for exploring a person's health-promoting behavior (Pender, Murdaugh, & Parsons, 2011).  Pender's Health Promotion Model (HPM) was first published in 1982 (Alligood & Tomey, 2010) as a framework for integrating nursing and behavioral science perspectives, to explore what motivates individuals to engage in behaviors that enhance health (Pender et al., 2011).  The theory has undergone revisions since that time to refine the variables of the model's three main categories: individual characteristics and experiences, behavior–specific cognitions and affect, and behavioral outcomes (Pender et al., 2002).  In addition, research has been conducted with the HPM since 1990 (Pender et al, 2011).  Although *operational* definitions are not provided for each of the variables in

the three main categories, the definitions provided are descriptive and therefore offer guidelines for measurement of the variables.  In addition, the behavioral outcome, health-promoting behaviors, can be measured by the Health-Promoting Lifestyle Profile II (Pender et al., 2011).  The purpose of the model is to look at the individual characteristics and experiences, behavioral-specific cognitions and affect, together with the immediate competing demands and preferences of the individual, to determine the person's commitment to a plan of action towards health-promoting behaviors (Pender et al., 2002, 2011).

**Assumptions and Propositions**

The HPM has explicit definitions for person, environment, nursing, health, and illness, and propositions that make clear statements about the relationships among the concepts (Pender et al., 2002; Fawcett, 2004).  The use of the HPM provides a framework for promoting healthy lifestyles that is appropriate for diverse and vulnerable populations increasing the generalizability of the theory (Hardy, 2004).

Pender et al. (2002) clearly identified theoretical propositions for the HPM that provide a foundation for further theory development and research within the model.

These theoretical propositions include:

1.  Prior behavior and inherited and acquired characteristics influence beliefs, affect, and enactment of health-promoting behavior.

2.  Persons commit to engaging in behaviors from which they anticipate deriving personally valued benefits.

3.  Perceived barriers can constrain commitment to action, a mediator of behavior as well as actual behavior.

4. Perceived competence or self-efficacy to execute a given behavior increases the likelihood of commitment to action and actual performance of the behavior.

5. Greater perceived self-efficacy results in fewer perceived barriers to a specific health behavior.

6. Positive affect toward a behavior results in greater perceived self-efficacy, which can in turn, result in increased positive affect.

7. When positive emotions or affect are associated with a behavior, the probability of commitment and action is increased.

8. Persons are more likely to commit to and engage in health-promoting behaviors when significant others model the behavior, expect the behavior to occur, and provide assistance and support to enable the behavior.

9. Families, peers, and health care providers are important sources of interpersonal influence that can increase or decrease commitment to and engagement in health-promoting behavior.

10. Situational influences in the external environment can increase or decrease commitment to or participation in health-promoting behavior.

11. The greater the commitment to a specific plan of action, the more likely health-promoting behaviors are to be maintained over time.

12. Commitment to a plan of action is less likely to result in the desired behavior when competing demands over which persons have little control require immediate attention.

13. Commitment to a plan of action is less likely to result in the desired behavior when other actions are more attractive and thus preferred over the target behavior.

14. Persons can modify cognitions, affect, and the interpersonal and physical environment to create incentives for health actions. (Pender et al., 2002, p. 63-64).

Proposition one, "prior behavior and inherited and acquired characteristics influence beliefs, affect, and enactment of health-promoting behavior" (Pender et al., 2002, p. 64), provides theoretical structure to study religiosity within the HPM in pregnant women. This relational statement, classified as a cause and effect statement, provides an explanation of how religiosity, as an acquired characteristic, can influence the healthy behaviors in pregnant women through influencing their beliefs and affect. Before testing this causal relationship, a relationship between religiosity and healthy behaviors for women at Pregnancy Resource Centers would need to be identified.

Proposition eight, "persons are more likely to commit to and engage in health-promoting behaviors when significant others model the behavior, expect the behavior to occur, and provide assistance and support to enable the behavior" (Pender et al., 2002, p. 64), is a relational statement classified as an association statement. Participation in organized religion (a component of religiosity) or participation in a faith-based service provided at the Pregnancy Resource Center can provide role modeling of behaviors that may improve health-promotion, promote integration of religious norms related to morals and personal behaviors, provide opportunities for "wholesome" social events, and invoke unspoken or spoken admonitions for not maintaining group expectations such as avoiding

alcohol or tobacco (Page et al., 2009, p.622). Measuring this association, through the variables of religiosity and the question of whether a woman has participated in any services at the Pregnancy Resource Center, provides data on whether these interpersonal influences are associated with health-promotion in pregnant women at the center.

An assumption upon which the above propositions are made is that, "Individuals in all their biopsychosocial complexity interact with the environment, progressively transforming the environment and being transformed over time" (Pender et al., 2002, p. 63). The transformational power inferred in this assumption is the theoretical underpinning for this research with pregnant women at Pregnancy Resource Centers. Research conducted at this faith-based Pregnancy Resource Center seeks to explore a "community-oriented" and "volunteer-driven" program whose mission recognizes the transformative power of citizen action to improve communities (Family Research Council, 2009, p. 21).

**Health-Promoting Behaviors**

Individual characteristics and experiences influence the choices people make related to health promotion and include the person's prior related behaviors and personal factors (Pender et al., 2002, 2011). For this study, personal factors, including biologic, psychologic, and sociocultural characteristics relevant to the behavior being considered, were investigated (Pender et al., 2002, 2011). Specific personal factors related to pregnant women that were included in this study are age, race and ethnicity, marital status, socioeconomic status, education level, gravidity, parity, length of pregnancy in weeks, length of time the woman had known she was pregnant, and pregnancy intention. Religiosity can also be considered a personal factor according to Pender (personal

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communication N. Pender, July 9, 2013) and therefore, was included as a personal factor in this research study.

Behavior-specific cognitions and affect are motivational factors for health promotion (Pender et al., 2011). Several variables were included in the behavior-specific cognitions and affect category including perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, situational influences, and interpersonal influences (Pender et al., 2002, 2011). These variables can be modified through interventions and therefore are especially important to healthcare professionals seeking to enhance health promotion (Pender et al., 2011).

Additionally, this study focused on interpersonal influences, which are defined as the behaviors, beliefs, or attitudes of others that influence a person regarding health promotion (Pender et al., 2011). Interpersonal influences include the norms of significant others, social support, and modeling of behaviors that influence whether an individual will be more or less likely to engage in health-promoting behaviors (Pender et al., 2011). Religiosity may provide interpersonal influences in norms, social support, and modeling. Page et al. (2009) noted organizational religiousness (participation in formal religious activity) may impact health behaviors through integrating religious norms regarding morality, providing positive role models and reinforcement for expected behaviors, offering opportunities for "wholesome" social activities, and recognizing the possibility of experiencing admonitions or the threat of admonitions for those who do not maintain the expected group behaviors (p. 622). In this study, interpersonal influences, including religiosity and the services received at the Pregnancy Resource Center, were examined to determine their relationship with health-promoting behaviors in pregnant women.

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The revised Health Promotion Model focused on individual characteristics

(personal factors) and behavioral-specific cognitions [interpersonal influences] (see

Figure 1) to look at the relationships between these variables and the behavioral outcome

of health-promoting behaviors, measured by the Health-Promoting Lifestyle Profile II.

| Individual Characteristics and Experiences | Behavior-Specific Cognitions and Affect | Behavioral Outcomes |
|---|---|---|
| Personal factors: demographic data, pregnancy-related, and religiosity | Interpersonal Influences: services received at the Pregnancy Resource Center and religiosity | Health-Promoting Behavior (measured by Revised Health-Promoting Lifestyle Profile II) |
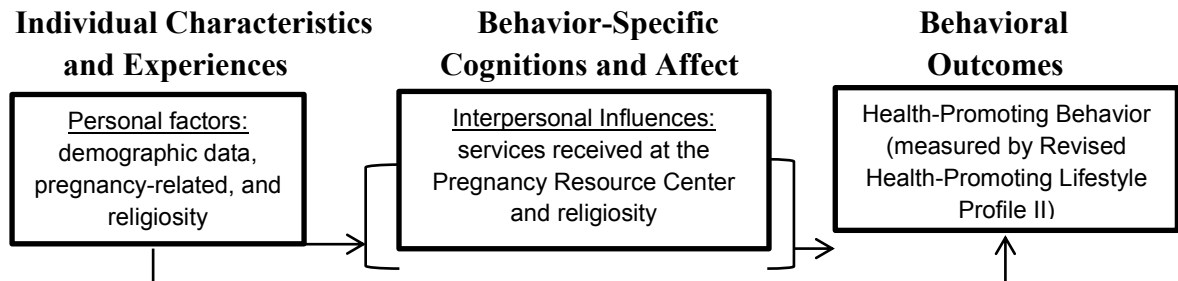
Figure 1. Revised Health Promotion Model for study of pregnant women at Pregnancy
Resource Centers.

## Philosophical Underpinnings of Research

The Health Promotion Model has a Reciprocal Interaction Worldview in which a

holistic perspective of an individual includes the transformative power of the individual

and the environment in a reciprocal relationship (Pender, 2011; Pender et al., 2011).

Reciprocal Interaction Worldview is a postpositivist perspective (Fawcett, 1993; Jacox,

Suppe, Campbell, & Stashinko, 1999), recognizing the interactive relationship between

the environment and individuals, as well as the ability to view humans holistically while

studying components of the individual within the context of that holistic perspective

(Pender, 2011).

The ontological stance of postpositivism is a critical realist position that, although

reality exists, it is never fully understood (Guba 1990). Although researchers strive to be

objective, the postpositivist beliefs recognize objectivity is not absolute and,

epistemologically, a modified objectivist stance is taken (Guba). Methodologically the postpositivist embraces research in a more natural setting than a laboratory and embraces discovery as an important component of science. The postpositivist methodology leads to the descriptive correlational approach used within this research study. The descriptive correlational research design does not attempt to manipulate or control the situation, but examines relationships among variables, which may lead to hypotheses for further research studies (Grove, Burns, & Gray, 2013).

## Summary

Investigating the relationship of religiosity and health-promoting behavior in pregnant women at Pregnancy Resource Centers provides insight about the pregnant women who seek services at Pregnancy Resource Centers. Chapter II is a discussion of the relevant literature on religiosity and health promotion in pregnant women. Chapter III will depict the methodology of this research study. Chapter IV is an analysis of the data from the research conducted. Finally, Chapter V is the discussion of how this research informs the nursing profession and adds to the professional body of knowledge.

# CHAPTER II

## REVIEW OF THE LITERATURE

### Introduction

This chapter describes the review of the literature focused on health-promoting behaviors, unintended pregnancy, and religiosity. The review included previous research related to health-promoting behaviors during pregnancy and the use of the Health-Promoting Lifestyle Profile II (HPLP II) for investigating health-promoting behaviors in pregnant women. Women who attend Pregnancy Resource Centers may report having an unintended pregnancy; therefore the literature review included research investigating the prevalence of unintended pregnancy and the relationship between unintended pregnancy and maternal/neonatal health. Lastly, a review of religiosity was conducted, including the relationship between religiosity and health-promoting behaviors during pregnancy. As mentioned in the previous chapter, the purpose of this study was to explore the relationship between religiosity and health- promoting behaviors of pregnant women at Pregnancy Resource Centers. The specific aims of this descriptive correlational study were to:

1. Describe the health-promoting behaviors of pregnant women at Pregnancy Resource Centers

2. Explore the relationship between each of the following sets of variables (religiosity, demographics, pregnancy-related variables, or services

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obtained at the Pregnancy Resource Center) and health-promoting

behaviors of pregnant women at Pregnancy Resource Centers

3. Determine the percentage of variance that religiosity explains in the health

promoting behaviors, above and beyond what the other variables explain,

in pregnant women at Pregnancy Resource Centers

The literature search included the use of several databases including Pub Med,

Cumulative Index for Nursing and Allied Health Literature (CINAHL), SCOPUS,

Psyclnfo, Open Access Theses and Dissertations, and ProQuest.  The key search terms

were: 1) Health behaviors, (Health Promotion Model) AND pregnancy; 2) Pregnancy

Resource Centers (Crisis Pregnancy Centers); 3) Pregnancy intention (unintended

pregnancy, unwanted pregnancy, unplanned pregnancy) AND health behaviors/maternal

behaviors, antenatal/prenatal care, neonatal outcomes; and 4) Religiosity (or religiousness

or religion) AND pregnancy (pregnant) NOT adolescents (AND NOT adolescents for

SCOPUS) AND health behaviors (alcohol, smoking, stress).  Each search primarily

focused on studies within the United States [US] (unless indicated), and did not include

adolescents or articles focusing on sexuality or reproductive health (ex. contraception,

HIV, abortion).  The religiosity literature review also did not include articles related to

grief or genetic counseling.  Since spirituality is a separate construct than religiosity, no

literature solely related to spirituality was included in this literature review.  Health

behaviors including sleep, nutrition, exercise, and variations on these terms were

searched with religiosity AND pregnancy with no relevant articles found. Additional

relevant sources were obtained when reviewing the reference lists from articles identified

through the databases. The literature search included articles in the last 10 years unless specifically noted.

A synopsis of the current literature in the above areas is discussed. The literature review includes: health-promoting behaviors during pregnancy (HPLP II, HPLP II and a faith-based intervention); Pregnancy Resource Centers; unintended pregnancy; (unintended pregnancy and maternal health behaviors; unintended pregnancy and neonatal outcomes); religiosity (dimensions of religiosity; measurement of religiosity; religiosity and health; religiosity and pregnancy behaviors). All studies reported were conducted in the United States, unless specifically noted in the literature review. In addition, gaps in the literature are identified in the discussion that follows.

## Health-Promoting Behaviors During Pregnancy

The health of children is impacted by choices made by parents beginning before conception and continuing through pregnancy and beyond (March of Dimes Foundation, 2010). Health promotion is defined as "the process of enabling people to increase control over their health and its determinants, and thereby improve their health" ("The Bangkok Charter", 2005, p. 1). Health-promoting behaviors during pregnancy enable the pregnant woman to maintain or improve not only her own health but also the health of her unborn child.

Pender et al. (2002) identified the major components of a health-promoting lifestyle including "health responsibility, interpersonal relations, spiritual growth, physical activity, nutrition, and stress management" (p. 108). *Health responsibility* involves personal responsibility for one's health and well-being (Walker & Hill-Polerecky, 1996). Health responsibility can include asking questions during a

healthcare provider visit, or seeking answers to health-related questions. In addition, health responsibility in a pregnant woman could be seen when she avoids behaviors that could negatively impact her fetus, and includes her participating in behaviors that will improve her overall health and the health of her child. Examples of some of these behaviors include not smoking (Smoking during pregnancy -- United States, 1990-2002, [2004]), obtaining prenatal care (March of Dimes Foundation, 2010), obtaining dental care (Babalola & Omole, 2010), avoiding alcohol (Andersen, Andersen, Olsen, Gronbaek, & Strandberg-Larsen, 2012; Bailey & Sokol, 2008), and avoiding illegal drugs (Pinto et al., 2010).

The category *interpersonal relations* includes communication to help gain close, meaningful relationships such as with a woman's partner, peers, or family (Walker & Hill-Polerecky, 1996). These relationships may impact her healthcare decisions as well as provide support needed during the pregnancy period (Stapleton et al., 2012). *Spiritual growth* focuses on developing internal resources through finding a sense of purpose and connection with the world around us (Walker & Hill-Polerecky, 1996). Jesse et al. (2007) reported in their qualitative study, forty-seven percent of pregnant women identified that spirituality affected their pregnancy in a positive way.

In addition, *exercise* (Stutzman et al. 2010), *proper nutrition* (Widen & Siega-Riz, 2011), and *stress management* (Lobel et al., 2008) are important to the overall health of the pregnant woman. Therefore, each of the components of a healthy lifestyle identified by Pender et al. (2002, 2011) is relevant for pregnant women. These health-promoting behaviors are measured by the Health-Promoting Lifestyle Profile II (Pender et al., 2002, 2011).

**Health-Promoting Lifestyle Profile II (HPLP II)**

Through the use of the HPLP II, an overall measure of health-promoting behaviors can be obtained for women at the Pregnancy Resource Center (Pender et al., 2002). Previous research with pregnant women using the Health Promotion Model (HPM) identified ethnicity as a significant predictor of health promotion [$\beta = .384$, $p < .01$] (Esperat, Feng, Zhang, & Owen, 2007). Lin, Tsai, Chan, Chou, and Lin (2009) noted significant differences between health-promoting lifestyles and educational level ($F(2, 169) = 8.03$, $p < .001$) and socioeconomic status ($F(3, 168) = 3.43$, $p < .01$); however, the authors did not specify which specific group differed. In addition, they noted a significant difference between health-promoting lifestyles and the presence of chronic diseases ($t(17) = -2.92$, $p < .01$). Significant differences were identified between health-promoting lifestyles and age, education, husband's education, and income in pregnant women in Turkey, although the authors reported only $p$ values from the ANOVA and did not report performing post hoc analysis to determine which groups differed through statistical analysis (Gokyildiz, Alan, Elmas, Bostanci, & Kucuk, 2013).

Kavlak et al. (2013) conducted research with 195 pregnant Turkish women. Using the Health-Promoting Lifestyle Profile [HPLP] (an earlier version of the HPLP II) they determined that women who were less educated ($t = 3.48$, $p < .01$), unemployed ($t = 2.70$, $p < .01$), and had lower monthly income ($F = 5.80$, $p < .01$) had lower HPLP scores indicating fewer health-promoting behaviors. Kavlak et al. also studied the relationship between a woman's feelings about her pregnancy and health-promoting behaviors. Women with unplanned pregnancies had significantly lower HPLP scores than women who had planned pregnancies [$t = 2.56$, $p < .05$] (Kavlak et al., 2013). In

addition, when women reported fear and unhappiness about their pregnancies they had significantly lower scores on the HPLP than women who reported feeling enthusiasm and happiness about the pregnancy ($t = 4.12, p < .01$)

In the United States, Bond et al. (2002) studied 230 Hispanic pregnant women and found pregnant women with higher education were noted to have higher scores on the HPLP II ($r = .215, p < .01$). No correlation was noted between marital status and any subscales in the HPLP II in that study (Bond et al., 2002). A weak correlation between age and the nutrition subscale ($r = .211, p < .001$) and religious preference and the stress subscale of HPLP II ($r = .16, p < .05$), were noted by Bond et al. However they did not indicate what religious preference was associated with increased HPLP II. They reported older participants scored higher on the nutrition subscale of the HPLP II.

The Health Promotion Model has been used to study a variety of health concerns of women during pregnancy. Smith and Michel (2006) measured the effect of an aquatic exercise program on health-promoting behaviors in pregnancy using the HPLP II. Bond et al. (2002) studied levels of acculturation and scores on the HPLP II in pregnant Hispanic women. The HPLP II was used to measure construct validity for a scale to identify barriers to healthy eating in pregnant women (Fowles & Feucht, 2004). In addition, it has been used to study pregnant women in a variety of countries around the world (Gharaibeh, Al-Ma'aitah, & Al Jada, 2005; Kavlak et al., 2013; Lin et al., 2009; Thaewpia, Howland, Clark, & James, 2013).

**HPLP II and a Faith-Based Intervention**

One study was identified in the literature review that used the Health Promotion Model to investigate a faith-based intervention conducted by parish nurses. Mendelson et

al. (2008) conducted a randomized clinical trial with 100 Mexican-American pregnant women with gestational diabetes.  One group of pregnant women received Care As Usual gestational diabetes education and one group received the Parish Nurse Intervention Program.  The Care as Usual group utilized a current standard program in California called Sweet Success Pregnancy Diabetes Program.  The Parish Nurse Intervention Program included the Sweet Success Protocols; as well Parish Nurse Protocols including offering prayer and encouraging spiritual connections as appropriate to the patient's religious beliefs.  The HPLP II was completed by participants before and after the interventions.  The pregnant women who received the Parish Nurse Intervention Program had significantly improved HPLP II scores following the intervention compared to women who received Care as Usual [$F$=5.980, $p$ =.016] (Mendelson et al., 2008).

The researchers identified significant differences in the pre and post intervention HPLP II subscales for pregnant women who participated in the Parish Nurse Intervention Protocol, "for stress management ($p$ =.003), health responsibility ($p$ =.000), nutrition ($p$ =.001), physical activity ($p$ =.000), and spirituality [$p$ =.005] (Mendelson et al., 2008, p. 421).  Whether the change in health-promoting behaviors was due to spiritual principles in the Parish Nurse Intervention Program or due to the provision of a more informal setting to ask questions, the results are consistent with a potential impact of faith-based interventions in the pregnant women community.

**Summary**

The HPLP II is an instrument used to measure health-promoting behaviors based upon Pender's Health Promotion Model (Pender et al., 2011).  Previous research with pregnant women using the HPLP II has provided insight into factors associated with

health promotion in pregnant women. HPLP II has also been used to measure the effectiveness of a faith-based intervention for pregnant women with gestational diabetes.

Additional research on this topic is necessary and will provide insight into factors related to health-promoting behaviors in pregnant women at Pregnancy Resource Centers, the population for this dissertation research. Pregnancy Resource Centers have been part of the resources available for pregnant women for almost 50 years. A brief discussion about the history of Pregnancy Resource Centers and research conducted at these centers will be discussed below.

## Pregnancy Resource Centers

Pregnancy Resource Centers are Christian community-centered organizations, funded primarily through private donations, and staffed primarily by volunteers (Family Research Council, 2009; Hussey, 2013). As noted in chapter one, the first Pregnancy Resource Centers emerged in the late 1960's and grew in number following legalization of abortion in the United States (Family Research Council, 2009; Kelly, 2009). Several organizational changes have happened in the almost 50 years since the first center was opened (Family Research Council, 2009, 2012; Hartshorn, 2003; Kelly, 2009). Some of these changes were in direct response to criticism from the pro-choice movement (Kelly, 2009); some were changes that happened due to political and legal concerns (Gilbert, 2013; Kelly, 2009). The names have changed from crisis pregnancy centers, to pregnancy help centers, to pregnancy resource centers and now some include *medical* in the name to reflect the medical services offered (Family Research Council, 2009; Hartshorn, 2003). However, one thing has remained unchanged; the Pregnancy Resource Center mission has consistently been to help women who are in need (Family Research

Council, 2009, 2012; Hussey, 2014). Notably, the methods of implementing the Pregnancy Resource Centers' mission have been scrutinized and, at times, criticized by some (Bryant & Levi, 2012; Bryant, Narasimhan, Bryant-Comstock, & Levi, 2014; Rowlands, 2011; Stacey, 2013), and have been changed over time in an attempt to fulfill the organization's mission of helping women facing unintended pregnancy (Hartshorn, 2003; Kelly, 2009, 2012).

**Research at Pregnancy Resource Centers**

Very little research has been conducted at Pregnancy Resource Centers. Only two dissertations were found that conducted research with women who visit these centers (Hill, 2005; Stark, 2012). Hill (2005) conducted a pilot study with women who had experienced at least one abortion and were willing to participate in a faith-based abortion support group for women with a focus on forgiveness following abortion. Support groups were held in ten different states, and not all women who attended the support groups were participants in the research study. Surveys were completed pre-and post-intervention measuring psychological distress, self-esteem, and spiritual well-being. Pre-intervention surveys were completed by 48 women, however only 25 women completed the post-intervention surveys. For these 25 women, Hill reported statistically significant differences in pre and post-test responses to religious well-being ($F$ [1, 24] = 13.29, $p$ =.001), existential well-being ($F$ [1, 24] = 38.13, $p$ < .001), and self-esteem ($F$ [1, 24] = 22.05, $p$ < .001) with each of these increasing in the post-test responses. Psychological distress was measured by a brief questionnaire to assess posttraumatic stress disorder (PTSD). Statistically significant differences were noted in pre and post- intervention

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PTSD symptoms ($F$ [1, 24] = 20.66, $p$ < .001) with a decrease noted in the PTSD symptoms following the abortion support group intervention.

Since the attrition rate was high in Hill's (2005) study, these results must be interpreted cautiously. Support group facilitators reported dropout rates were low for the support groups and overall responses were positive. Hill reported that no statistical differences were noted between women who completed pre and post-intervention surveys and those who completed only pre-intervention surveys. It is possible the women who did not find the support group beneficial did not complete the post-intervention survey. However, as reported by Hill (2005), whether the women did not want to participate in the post-survey or whether volunteer group leaders were inconsistent in encouraging post-intervention survey completion, the resultant decrease in post-intervention surveys reduced the power and statistical significance of the study.

The second dissertation study investigated the relationship between stressors, family of origin, and general well-being in 113 single mothers at a Pregnancy Resource Center (Stark, 2012). Results indicated the Overall Score of Stressors from the Survey of Recent Life Experiences (SRLE) was a negative predictor of General Well-Being ($\beta$ = -.391, $p$ <.001) and higher levels of perceived psychological health on the Family of Origin scale was a positive predictor of General Well-Being ($\beta$ = .312, $p$ < .001). Two subscales of the SRLE, Finances and Social Victimization, were identified as significant negative predictors of General Well-Being in single mothers at the Pregnancy Resource Center [$\beta$ = -.355, $p$ < .001; $\beta$ = -.265, $p$ = .031 respectively] (Stark, 2012). Social victimization was defined as "any mistreatment by others that caused stress to these single mothers" (Stark, 2012, p. 68).

Research at Pregnancy Resource Centers is limited, and neither of these studies investigated women with unintended pregnancies. As previously mentioned, the Family Research Council (2009, 2012) indicated that Pregnancy Resource Centers provide services to women facing unintended (which they report as unplanned or unexpected) pregnancies. Therefore, the literature on unintended pregnancy will be reviewed in the following section.

## Unintended Pregnancy

Although some type of contraception is available to most women (Barot, 2008), 51% of pregnancies in the United States are unintended (Finer & Zolna, 2014) and as such, it is now recommended that prenatal care begin with a preconception visit (March of Dimes Foundation, 2010). Unfortunately, as mentioned previously, women with pregnancies that are unintended may not obtain the recommended health care nor perceive the need for preconception health practices.

### Unintended Pregnancy and Maternal Health Behaviors

**Maternal health behaviors in the preconception period.** The impact of pregnancy intention on neonatal outcomes is likely related to the health behaviors of the pregnant woman. Since women with unintended pregnancies are not planning pregnancy, these women may be unconcerned about their health behaviors during the preconception period. Although the CDC (2013b) recommends all women take care of their health prior to pregnancy, almost 70% of women do not consume adequate folic acid prior to pregnancy and approximately 50% of women drink alcohol before conception (DHHS, 2013c), both contrary to recommendations for pregnancy health. Using Pregnancy Risk Assessment Monitoring System (PRAMS) data from 2001-2006 in

Maryland, Cheng et al. (2009) reported women with unintended pregnancies were two times more likely not to have consumed adequate folic acid in the three months prior to pregnancy than women with intended pregnancies (Mistimed: Adjusted *OR*= 2.17, 95% CI [1.78, 2.64]; Unwanted:  Adjusted *OR* = 2.33, 95% CI [1.71, 3.19]).  In a nationally representative survey, Chuang, Hillemeier, Dyer, and Weisman (2011) reported women who *intended* to be pregnant within the next twelve months were 1.57 times more likely to report daily folic acid use (Adjusted *OR* = 1.57, 95% CI [1.21, 2.04]) than those not intending future pregnancy.  No associations were noted between heavy drinking or not smoking and women's reported pregnancy intention within twelve months (Chuang et al., 2011).

When a woman becomes aware she is pregnant, she then has the opportunity to change her health habits to promote a healthier pregnancy.  However, not all women choose to change their health behaviors.  Dott et al. (2010) reported that women with an unintended pregnancy who were twenty years of age or older were 1.31 times more likely to continue not taking or stop taking folic acid/vitamins once they were aware they were pregnant than women who had intended pregnancies (Adjusted *OR*= 1.31; 95% CI [1.10, 1.56]).  Women twenty years of age or older with unintended pregnancies were more likely to continue or start smoking cigarettes during their pregnancy (Adjusted *OR*= 1.82; 95% CI [1.42, 2.32]) and to continue or increase caffeine intake to > 300 mg/day (Adjusted *OR* = 1.44; 95% CI [1.10, 1.88]) once they were aware they were pregnant compared to women with intended pregnancies (Dott et al., 2010). No significant association was identified in women with unintended pregnancies who were less than twenty years old.  Dott et al. also noted that women who reported an unintended

pregnancy who had not had a previous live birth were 5.82 times more likely to continue or start to use illicit drugs (Adjusted *OR*= 5.82; 95% CI [2.34-14.47]) and to continue or start to use a hot tub or sauna (Adjusted *OR*= 2.79; 95% CI [1.75-4.42]) than women with an intended pregnancy. Therefore, some women who have unintended pregnancies may not change their unhealthy behaviors even after they realize they are pregnant.

**Maternal health behaviors during pregnancy.** In literature reviewed over the last 15 years, an association between unintended pregnancy and unhealthy maternal behaviors during pregnancy has been identified. Women who reported an unintended pregnancy (either unwanted or mistimed) had a significantly higher likelihood of initiating prenatal care late, receiving none at all, or having inadequate prenatal care (Cheng et al., 2009; D'Angelo, Gilbert, Rochat, Santelli, & Herold, 2004; Humbert et al., 2011; Dibaba et al., 2013; Pulley et al., 2002), were significantly more likely to use alcohol (Cheng et al., 2009; Orr et al., 2008; Kitsantas et al., 2015), illicit drugs (Dott et al., 2010; Orr et al., 2008; Than et al., 2005), or tobacco (D'Angelo et al., 2004; Dott et al., 2010; Orr et al., 2008; Than et al., 2005; Terplan et al., 2014), and were less likely to take folic acid and/or vitamins (Dott et al., 2010; Than et al., 2005) than women with intended pregnancies. Ethen et al. (2009) reported that women with unintended pregnancies were more likely to drink alcohol and binge drink than women with intended pregnancies in 4,088 randomly selected mothers from the National Birth Defects Prevention Study during 1997–2002 after adjusting for age, race/ethnicity, education, household income, birthplace, research site, smoking during pregnancy, and pre-pregnancy drinking.

Orr et al. (2008) conducted a prospective research study with 913 pregnant Black women in prenatal clinics in Baltimore, Maryland using a prenatal survey and a chart review to identify maternal behaviors during pregnancy. Orr et al. noted women with unwanted pregnancies were more likely to smoke (Adjusted $OR$ = 2.02; 95% CI [1.24, 3.33]), use alcohol (Adjusted $OR$ = 2.08; 95% CI [1.11, 3.90]), use illicit drugs (Adjusted $OR$= 1.8; 95% CI [1.0, 2.9]), and initiate prenatal care in the third trimester (Adjusted $OR$=5.71; 95% CI [3.5, 9.4]) than women who reported pregnancy intention as mistimed, wanted, or unsure.

Although the literature was consistent regarding the association between unintended pregnancy and negative maternal health behaviors, variations were noted between mistimed and unwanted pregnancies. One interesting difference noted in several research studies was that mistimed pregnancies were more frequently reported by younger women, while unwanted pregnancies were more frequently reported by older women (Cheng, et al., 2009; D'Angelo et al., 2004; Humbert et al., 2011). Several authors noted women with unwanted pregnancies reported less healthy maternal behaviors than those with mistimed or intended pregnancies (Chisolm et al., 2014; Hulsey, 2001; Humbert et al., 2011; Orr et al., 2008; Terplan et al., 2014). However, research conducted by Cheng et al. (2009) noted women with mistimed pregnancies were significantly more likely to use alcohol than those who reported intended or unwanted pregnancies, while women with unwanted pregnancies were less likely to use daily folic acid or have initiated prenatal care in the first three months and were more likely to use cigarettes during pregnancy than women with mistimed or intended pregnancies.

Several current authors have begun to combine mistimed pregnancies with intended pregnancies when the variable is dichotomized (Chisolm et al., 2014; Terplan et al., 2014) and some report that women with mistimed pregnancies respond to survey questions in a similar manner as women with intended pregnancies (Orr et al., 2008). Since outcomes of mistimed pregnancy can vary by the length of time by which a pregnancy is mistimed (Pulley et al., 2002) and outcomes of mistimed and unwanted pregnancies continue to vary by study population (Cheng et al., 2009; Chisolm et al., 2014; Hulsey, 2001; Humbert et al., 2011; Orr et al., 2008; Terplan et al., 2014), several researchers recommend separate analysis for mistimed and unwanted pregnancies (Humbert et al., 2011; Santelli et al. 2003). However, unintended pregnancy continues to be defined by DHHS as mistimed and unwanted pregnancy (DHHS, 2013b).

**Maternal health behaviors and socioeconomic factors.** Although these studies clearly support the relationship between unintended pregnancy and unhealthy maternal behaviors, a literature review conducted by Gipson, Koenig, and Hindin in 2008 cast some doubt on whether maternal risk factors and pregnancy intention were related. Gipson et al. reported that when "family-background variables" such as socioeconomic factors and household characteristics were accounted for, unhealthy maternal risk factors and unintended pregnancy was not strongly related. For example, Joyce et al. (2000a) reported that after adjusting for sociodemographic and household characteristics, no association was noted between unintended pregnancy (mistimed or unwanted) and later prenatal care, heavy smoking, or low birth weight.

However, in some of the research articles reported by Gipson et al. (2008), it was clear that pregnancy intention remained associated with several maternal risk factors after

controlling for demographic, socioeconomic, and family variables. For example, Kost, Landry, and Darroch (1998) reported that after adjusting for the women's social and demographic factors, women with mistimed pregnancies were less likely to quit smoking during pregnancy than women with intended or unwanted pregnancies ($r = .74$, $p < .05$), though no significant relationship was identified between pregnancy intention and alcohol use or whether the woman took vitamins. Additionally, Joyce, Kaestner, and Korenman (2000b) analyzed data from the National Longitudinal Study of Youth (NLSY) and found that women who reported an unintended pregnancy were more likely to have initiated later prenatal care ($OR = 1.296$; $p < .05$) than those who reported intended pregnancies; however, no significant associations were found regarding smoking during pregnancy.

Dibaba et al. (2013) conducted a meta-analysis of pregnancy intention and antenatal care services. Thirty-two observational studies with reported adjusted odds ratios and confidence intervals were included. Findings showed that women with unintended pregnancies had increased odds of delayed prenatal care ($OR= 1.47$, 95% CI [1.27, 1.59]) and inadequate prenatal care ($OR = 1.64$; 95% CI [1.47, 1.82]) compared to women with intended pregnancies (Dibaba et al., 2013).

Although it is clear that some of the significant associations between pregnancy intention and maternal behaviors are eliminated or reduced when demographic, socioeconomic, and family variables are adjusted, some associations remain indicating some women with unintended pregnancies may exhibit unhealthy behaviors during pregnancy even after adjusting for social and demographic variables. Continued research

has been conducted in this area in the United States and around the world. Research

conducted within the last five years will be specifically noted below.

**Unintended pregnancy and maternal health behaviors 2010-2015.** Current

literature (less than five years) continues to support the connection between unintended

pregnancy and unhealthy maternal behaviors both in the United States and in other

countries around the world (Chisolm, et al., 2014; Exavery et al., 2013; Humbert et al.,

2011; Kavlak et al., 2013; Khajehpour, Simbar, Jannesari, Ramezani-Tehrani, & Majd

2013; Kitsantas et al., 2015; McCrory & McNaly, 2013; Murphy, Dunney, Mullaly,

Adnan, & Deane, 2013; Terplan et al. 2014).

A study of 478 women considered economically at risk (self-pay, Medicaid, or

local subsidized insurance plan), investigated pregnancy intention controlling for

socioeconomic variables (Humbert et al., 2011). Face to face surveys were completed

during the women's postpartum hospitalization and data were obtained from the birth

certificates of their children. After controlling for age, race, ethnicity, marital status and

parity, multivariate logistic regression was utilized to identify differences in maternal

health behaviors for differing levels of pregnancy intention. Women who had an

unwanted pregnancy were two times more likely (Adjusted *OR* = 2.149, 95% CI [1.155,

3.998]) to have smoked during pregnancy and not had adequate prenatal care (Adjusted

*OR* = 2.116, 95% CI [1.080, 4.146]), and less likely (Adjusted *OR* = 0.515, 95% CI

[0.271, 0.976]) to use WIC services compared to women who reported an intended

pregnancy. Humbert et al. (2011) noted that having a mistimed pregnancy was not

significantly related with these maternal behaviors.

Kitsantas et al. (2015) utilized 2002-2009 PRAMS datasets to identify high-risk

subgroups for alcohol consumption based upon age in pregnant women. The sample

consisted of 362,752 women who were 2-6 months postpartum following a single birth.

Pregnancy intention was categorized as wanted (wanted to be pregnant then or sooner)

and unwanted (unwanted or mistimed). For women less than 24 years of age, reporting

that their pregnancy was unwanted was associated with greater odds of having consumed

alcohol during the last semester of their pregnancy ($OR = 1.25$, 95% CI [1.06, 1.48]);

however, older women did not have a significant association between unwanted

pregnancy and alcohol consumption in the third trimester.

In 2014 two studies were published in which researchers analyzed data from the

2004-2008 PRAMS and compared women with unwanted pregnancies to women with

mistimed or intended pregnancies (Chisolm et al., 2014; Terplan et al., 2014). In both

studies, unintended pregnancies were specifically identified as unwanted pregnancies

only, and intended pregnancies included mistimed pregnancies. After adjusting for

confounders, women with unwanted pregnancies were less likely to quit smoking or

reduce the amount of smoking during pregnancy than women with intended or mistimed

pregnancies [Adjusted $OR = 0.86$, 95% CI [0.78, 0.95]] (Chisolm et al., 2014). Terplan

et al. (2014) reported that there was no significant relationship between whether a woman

reduced or quit drinking alcohol during pregnancy and whether her pregnancy was

intended (intended and mistimed) or unintended (unwanted only). Women with

unwanted pregnancies were 1.40 times more likely to report binge drinking in the last

trimester than women with mistimed or intended pregnancies [Adjusted $OR=1.40$, 95%

CI [1.07, 1.83]] (Terplan et al., 2014).  These studies specifically focused on *unwanted pregnancies only* as an operational definition of unintended pregnancy.

Researchers in Ireland, Iran, Tanzania, and Turkey have recently published articles investigating unintended pregnancies (mistimed and unwanted) within their countries (Exavery et al., 2013; Kavlak et al., 2013; Khajehpour et al., 2013; McCrory & McNaly, 2013; Yanikkerem, Aye & Piro, 2013).  These studies each found that women with unintended pregnancies reported fewer health-promoting behaviors during pregnancy. For example, McCrory and McNaly (2013) studied 11,134 families in Ireland with infants nine months of age to identify associations between pregnancy intention and maternal behaviors and neonatal outcomes.  Pregnancy intention was assessed nine months postpartum.  Almost 41% of the women report an unintended pregnancy (40.7%). Women with unintended pregnancies were less likely to take preconception folic acid (Adjusted Relative Risk [*RR*] = 0.62, 95% CI [0.60, 0.65]) and more likely to have their first prenatal appointment later than 16 weeks gestation (Adjusted *RR* = 1.66, 95% CI [1.39, 1.98]); smoke during pregnancy (Adjusted *RR* = 1.24, 95% CI [1.13, 1.36]); and to drink alcohol during pregnancy (Adjusted *RR* = 1.15, 95% CI [1.06, 1.24]) than women who had intended pregnancies (McCrory & McNaly, 2013).

While maternal behaviors associated with unintended pregnancy have been discussed in this literature review, it is important to consider the relationship between unintended pregnancy and neonatal outcomes as well.  Women who report an unintended pregnancy may also report fewer health-promoting behaviors potentially leading to adverse neonatal outcomes.  Although neonatal outcomes are not a variable in this study,

understanding the relationship between unintended pregnancy and neonatal outcomes

provides greater understanding about the implications of this dissertation research study.

**Unintended Pregnancy and Neonatal Outcomes**

       **Low birth weight and preterm birth.** Not only is there an association between

unhealthy maternal behaviors and unintended pregnancies, some researchers have

identified that unintended pregnancies have also been associated with poor neonatal

outcomes, such low birth weight or preterm births (Flower, Shawe, Stephenson, & Doyle,

2013; Mohllajee, Curtis, Morrow, & Marchbanks, 2007; Orr, Miller, James, & Babones,

2000; Shah et al., 2011). Shah et al. (2011) conducted a meta-analysis and identified that

unintended, mistimed, or unwanted pregnancies ending in a live birth were associated

with a significantly increased risk of low birth weight and preterm birth. After

controlling for demographic and behavioral factors, Mohllajee et al. (2007) studied

PRAMS data from 1996-1999 and identified that women with unwanted pregnancies had

an increased likelihood of having a preterm delivery (Adjusted $OR$ = 1.16, 95% CI [1.01,

1.33]) and premature rupture of the membranes (Adjusted $OR$ 1.37, 95% CI [1.01, 1.85])

compared to women who had intended pregnancies. Women who were ambivalent about

their pregnancies had a greater likelihood of low-birth weight infants (Adjusted $OR$=1.15,

95% CI [1.02, 1.29]) and those with mistimed pregnancies had a lower odds of low-birth

weight infants (Adjusted $OR$= 0.93, 95% CI [0.82, 0.97]) than women with intended

pregnancies (Mohllajee et al., 2007).

       In England, a national longitudinal cohort study followed 18,819 babies born

between 2000 and 2001(Flower et al., 2013). Flower et al. determined there were

increased odds of having a low birth weight baby with unplanned pregnancies after

adjusting for mother's age, deprivation (based upon zip code, but specific deprivation not identified), relationship status, fertility treatment and smoking compared to women with planned pregnancies (Adjusted $OR$ = 1.24; 95% CI [1.04, 1.48]).  An increased odd of prematurity (<37 weeks gestation) was also identified in women with unplanned pregnancies compared to planned pregnancies (after adjusting for mother's age, deprivation, relationship status, fertility treatments, BMI, and smoking) [Adjusted $OR$ = 1.24, 95% CI [1.05, 1.45] (Flower et al., 2013).

However, several studies have not supported the association between unintended pregnancy and adverse neonatal outcomes (Keeton & Hayward, 2007; Messer, Dole, Kaufman, & Savitz, 2005; Postlethwaite, Armstrong, Hung, & Shaber, 2010).  In a study of 1,784 women at a managed care center, no statistical difference between birth outcomes for unintended pregnancies and planned pregnancies was reported (Postlethwaite et al., 2010).  The sample in the Postlethwaite study was recruited from women who received prenatal care in a managed care center.  As mentioned previously, researchers have identified women with unintended pregnancies often initiate prenatal care later in their pregnancy or not at all.  However, Postlethwaite et al. (2010) reported that 37.8% of the pregnancies in the study were reported as unintended yet early prenatal care for pregnant women in the study was as high as 92%.  Postlethwaite et al. noted early prenatal care appeared to reduce the risk of poor pregnancy outcome regardless of pregnancy intention; however, the concern remains for women in unintended pregnancies who do not seek prenatal care or enter into prenatal care much later in pregnancy.

Messer et al. (2005) studied 1,908 pregnant women recruited from a prenatal clinic and found no statistically significant difference between pregnancy intention and

preterm birth. In this study, two forms of data collection were used. A mail back survey was used to assess psychosocial variables and a telephone survey was used for reporting pregnancy intention, demographics, and pregnancy history. The use of the telephone survey for assessing pregnancy intention may have produced response bias in the subjects due to socially desirable responding. In addition, only women with a telephone were able to participate in this study.

Although preterm birth and low birth weight were not associated with pregnancy intention in McCrory and McNally's (2013) study in Ireland, there was a slightly greater risk of birth complications of women with unintended versus intended pregnancies (*RR* =1.08; 95% CI [1.02-1.14]), after adjusting for marital status, maternal age, ethnicity, household social class, maternal education, household income, parity, folic acid use, smoking during pregnancy, drinking during pregnancy and timing of the first antenatal booking appointment. The authors did not report whether these women obtained prenatal care. However, significant negative inverse associations between pregnancy intention and maternal health behaviors were noted in McCrory and McNally's study, as mentioned above.

Of the studies reviewed for this literature review, only a few have investigated whether there is a difference in the relationship between unintended pregnancy and neonatal outcomes based upon ethnicity. Afable-Munsuz and Braveman (2013) studied data from the California Maternal Infant Health Assessment (1999-2003). Immigrant Latina women who reported they were unsure about their pregnancy had an increased likelihood of having a preterm birth after adjusting for socioeconomic factors (*OR*= 1.49; 95% CI [1.08, 2.06]). The authors reported that no significant relationship was noted

between pregnancy intention and preterm birth in White, Black, or U.S. born Latina women (Afable-Munsuz & Braveman, 2013).

An older study conducted by Orr et al. (2000) focused solely on Black, low-income pregnant women in an urban setting. They conducted a prospective cohort study and recruited women at their first prenatal visit from four prenatal clinics. Pregnancy intention was assessed via questionnaire during the pregnancy. Orr et al. reported that Black, low-income pregnant women with unintended pregnancies had an increased odds of preterm delivery after controlling for confounding variables that were associated with preterm delivery ($p < .05$) including alcohol use, drug use, smoking, abruptio placenta, bleeding during pregnancy, chronic disease, hospitalized during pregnancy, poor weight gain, pre-eclampsia, and previous poor pregnancy outcome than women with intended pregnancies (Adjusted *OR*= 1.83, 95% CI [1.08, 3.08]).

In a study conducted by Keeton and Hayward (2007) using data from PRAMS (1993-2001) it was found that young White women (<22 years of age) with an *intended* pregnancy had an increased risk of a very low birth weight/very preterm (VLBW/VPT) births compared to women with unintended pregnancies which decreased with maternal age (Relative Risk Index, [*RRI*] = 1.27 to 1.14). Black women across the age groups with *intended* pregnancies had increased risks for VLBW/VPT births compared to Black women with unintended pregnancies with very little variation by age (*RRI* = 1.18 to 1.19). These results were after adjusting for maternal age, marital status, tobacco use, alcohol use, early prenatal care (first trimester), number of prenatal care visits, medical complications, birth history, and previous preterm birth or previous low birth weight. It is concerning that Keeton and Hayward reported in their study intended pregnancies were

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associated with adverse neonatal outcomes.  Several explanations for these results were reported by Keeton and Hayward.  One possible consideration was that unhealthy prenatal behaviors (tobacco use, alcohol use, and prenatal care) were mediators between unintended pregnancies and adverse neonatal outcomes; therefore after adjusting for unhealthy prenatal behaviors, no significant relationship remained in this sample related to unintended pregnancies.

**Summary**

The importance of recognizing the potential impact of pregnancy intention on maternal health behaviors is apparent in this literature review.  The literature is inconsistent regarding whether unintended pregnancy is specifically associated with preterm birth or low birth weight.  However, a trend indicates unintended pregnancy is related to some unhealthy maternal behaviors that can contribute to adverse neonatal outcomes, including preterm and low birth weight babies.  In addition, recognizing that unintended pregnancy is not the only factor that impacts health-promoting behaviors in pregnant women is important when seeking to gain a clear understanding of the needs of these women.  The last section of the literature review will summarize the literature specific to religiosity and look at the relationship between religiosity and maternal health behaviors during pregnancy.

<div align="center">

**Religiosity**

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Religion has been defined by Pargament (1997) as "a search for significance in ways related to the sacred" (p. 32).  However, the dimensions of this search for significance have been difficult to elucidate.  Scholars have sought to describe religiosity over the years and have identified numerous and varied dimensions of the construct

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(Bjamason, 2007; Cornwall, Albrecht, Cunningham, & Pitcher, 1986; Glock, 1962; Penhollow, Young, & Baily, 2007; Wulff, 1991).

Religiosity is frequently used interchangeably with the word spirituality; however, spirituality is viewed as a broader concept that can include views from multiple faiths or perhaps no faith at all (Koenig, King, & Carson, 2012).  Spirituality has been defined as "intimately connected to the supernatural, the mystical, and to organized religion, although it extends beyond organized religion [and begins before it]" (Koenig et al., 2012, p. 46).  For the purpose of this paper, religiosity is discussed without including the construct of spirituality, except where intertwined in the relevant literature.  Religiosity, or religiousness, includes "membership and participation in the organizational structures, beliefs, rituals, and other activities related to a religious faith like Judaism, Hinduism, Islam, or Christianity" (Moberg, 2008, p. 101).  The dimensions of religiosity will be explained below.

**Dimensions of Religiosity**

After conducting this literature review, five dimensions of religiosity were included in this dissertation research: organized religiosity, non-organized religiosity, religious affiliation, religious commitment, and intrinsic religiosity.  Organized religiosity includes participation in formal, organized religious activities (Fetzer Institute, National Institute on Aging Working Group, 2003) such as religious service attendance, and frequency of attendance in those activities (Mann, Mannam, Quinones, Palmer, & Torres, 2010).  Non-organized religiosity includes the private aspects of a person's religion not occurring in an organized setting (Fetzer Institute, National Institute on Aging Working

Group, 2003) including, for example, personal prayer or reading of religious materials (Haward, et al., 2012; May et al., 2005).

A person's religious commitment includes "the importance of and commitment to" their religious beliefs (Fetzer Institute, National Institute on Aging Working Group, 2003, p.71). Worthington et al. (2003) defined religious commitment as "the degree to which a person adheres to his or her religious values, beliefs, and practices and uses them in daily living" (p. 85). According to Cyphers et al. (2015), "religious commitment includes a choice to continue in one's faith in God even when life is difficult or painful, and answers to problems are elusive." This component of religious commitment reflects a person's surrender to God. In earlier work on surrender to God, Wong-McDonald and Gorsuch (2000) proposed that surrender to God was an "internal motivation to follow God and to act in obedience despite the costs" (p.150). Therefore, religious commitment includes both surrender to God and attendance at religious services, thereby including both belief and action in this dimension of religiosity (Clements, Fletcher, Cyphers, Ermakova, & Bailey, 2013).

Intrinsic religiosity represents "the pervasiveness of religious influence in daily life" (Fetzer Institute, National Institute on Aging Working Group, 2003, p. 71). Intrinsic religiosity and extrinsic religiosity are dichotomous motivations for personal religion, described by Allport and Ross (1967) as, "the extrinsically motivated person *uses* his religion, whereas the intrinsically motivated *lives* his religion" (p. 434). A person who is motivated extrinsically is seeking an outside benefit from their religion, such as financial, social, or personal accolades (Allport & Ross, 1967). Theologically, the extrinsically motivated person "turns to God, but without turning away from self" (Allport & Ross,

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1967, p. 434).  In contrast to extrinsic religiosity, a person with high intrinsic religiosity lives out their faith and this in itself is the reward (Allport & Ross, 1967).

The last dimension of religiosity is the person's report of religious affiliation or preference.  Although this dimension is not always included in religiosity, the Fetzer Institute, National Institute on Aging Working Group (2003) identified religious preference as a dimension of religiosity since a person's religious preference may not signify an actual participation in the organized religion.  In addition, Moberg (2008) noted the importance of identification of religious affiliation in research due to inherent differences between various religions and denominations.

**Measurement of Religiosity**

Religiosity can be measured in a variety of ways including the use of instruments to measure diverse components of the construct (Egbert, Mickley, & Coeling, 2004).  The Multidimensional Measurement of Religiousness/Spirituality for Use in Health Research (Fetzer Institute, National Institute on Aging Working Group, 2003) was developed as a comprehensive tool for measurement of religiosity/spirituality.  Twelve separate domains were identified with specific questions developed for each domain.  Although the tool is intended to be used as a whole, the authors recognize the usefulness of the tool for measuring specific components of religiosity (Fetzer Institute, National Institute on Aging Working Group).

Several scales have been developed to determine intrinsic or extrinsic religiosity such as the Religious Orientation Scale (Allport & Ross, 1967), Hoge Scale for Intrinsic Religiosity (Hoge, 1972), and the Duke University Religion Index (Koenig & Bussing, 2010; Koenig et al., 1997).  The Religious Orientation Scale had a skew toward

Christianity only (Hoge, 1972), and some researchers considered this scale to have theoretical issues (Hoge, 1972; Kirkpatrick & Hood, 1999). Hoge Scale for Intrinsic Religiosity (Hoge, 1972) focused on the motivations behind faith rather than organized religiosity and measured only one dimension of religiosity, intrinsic religiosity. The Duke University Religion Index (DUREL) is a 5-item measure of religious involvement measuring three dimensions of religiosity including organizational religious activity, non-organizational religious activity, and intrinsic religiosity (Koenig & Bussing, 2010).

Religious commitment is a measure of a person's surrender to God as well as their attendance at religious services (Clements et al., 2013). As mentioned previously, Wong-McDonald and Gorsuch (2000) proposed that surrender to God was an "internal motivation to follow God and to act in obedience despite the costs" (p.150). The Surrender Scale was developed to measure surrender to God and included such items as "When I am in distress, my hope is renewed when I act in accordance to God's directions" and "Even though I may not fully understand God's solution to a problem, I will carry out God's solution as God directs me to" (Wong-McDonald & Gorsuch 2000, p. 154). The Surrender Scale has been found to be strongly correlated to intrinsic religiosity [$r = 0.62$, $p < .01$] (Wong-McDonald & Gorsuch, 2004).

Clements and Ermakova (2012) suggested that surrender to God could be used as a measure of intrinsic religiosity to identify those whose focus is centered on God. However, The Surrender Scale had twelve items which could limit the ability to use the scale within a clinical setting. Therefore a brief scale was developed based upon the Surrender Scale, that included the two items on the scale most highly correlated with the overall total score on the Surrender Scale and one item on the frequency of religious

service attendance, thereby including both beliefs and action as a measure of religious commitment (Clements et al., 2013). The brief scale, Religious Surrender and Attendance Scale (RSAS-3) was also strongly correlated with intrinsic religiosity [$r$ = .646, $p$ < .001] (Clements et al., 2013). In the most recent version of this religious commitment scale, a satisfaction component was added to allow individuals to rate how satisfied they are with their level of religious commitment (Cyphers & Clements, 2015).

Although nurse scientists recommend seeking to build upon previous knowledge in religiosity research, no consistent measure of religiosity has emerged (Cohen, Holley, Wengel, & Katzman, 2012). Due to lack of a recent systematic critique of the methodological tools, Cohen et al. (2012) recommended researchers carefully choose their operational definition of religiosity, and then determine the most appropriate measurement tool based upon the population and research question. In this dissertation research study, the Duke Religion Index was used to measure organizational religiosity, non-organizational religiosity, and intrinsic religiosity (Koenig & Bussing, 2010; Koenig et al., 1997). In addition, the Religious Satisfaction and Surrender Scale was used to measure religious commitment (Cyphers & Clements, 2015). Finally, one question asked participants about their religious affiliation.

**Religiosity and Health**

Thousands of research articles have been written on religion and spirituality over the last forty years (Koenig, 2012). In addition, two editions of a book have been written to provide a summary of the literature published on religion and health (Koenig et al., 2012). In order to provide a foundation for the discussion of religiosity and health promotion in pregnancy, a brief summary of some of the reported literature on the

relationship between religiosity and health will be discussed (Koenig, 2012; Koenig et al., 2012).

Many religions have precepts specific to how individuals should take care of their physical bodies.  In the Christian religion, a person's physical body is said to be "God's temple" and as such there is an expectation that the person will take care of his or her body and avoid activities that could harm the body (I Corinthians 3:16, New International Version).  Other religions have similar expectations.  For instance in the Jewish faith, "taking care of one's body is considered a mitzvah" or commandment (Scheib, 2013, "A Healthy Body and Soul," para. 2).  Adherents to the Islamic religion believe the physical body "should not be abused or neglected but maintained in good order" (Stacey, 2008, "Fitness and Exercise", para. 3).

These religious beliefs potentially impact the health behaviors of people who identify with each particular religion.  Researchers have studied health habits of individuals and their level of religiosity/spirituality.  Koenig (2012) reported, after his extensive literature review, that he found one hundred and thirty-seven studies investigating the relationship between religiosity/spirituality and smoking.  Ninety percent of these articles (123 articles) indicated that as the level of religiosity/spirituality increased, smoking decreased (Koenig).  Sixty-eight percent of the studies reviewed (25 out of 37) indicated a positive relationship between religiosity/spirituality and greater physical activity (Koenig).  Additional research was described by Koenig including research on diet, weight, and sexual behavior.  The results of these studies indicated that many individuals who would classify themselves as religious or spiritual exhibited healthier behaviors (Koenig).

Since religiosity has been associated with healthy behaviors for some, it is important to consider the association between religiosity and health-promoting behaviors in pregnant women. Women who are pregnant and report they are in an unintended pregnancy are at risk for unhealthy practices during pregnancy. Studying the factors that may be associated with health-promoting behaviors in pregnant women provides insight into better explanations and future interventions to enhance health practices in this vulnerable population.

**Religiosity and Pregnancy Behaviors**

It is true that studying religiosity provides insights into the character of an individual, however "to know that a person is in some sense 'religious' is not as important as to know the role religion plays in the economy of his life" (Allport & Ross, 1967, p. 442). Although some women report childbirth is a time to grow closer to God and that their religiosity is strengthened (Callister & Khalaf, 2010), we also want to know how this impacts the health of their babies.

**Religiosity and maternal health practices**. Researchers have studied the association between religiosity and health practices of pregnant women. Increased religiosity has been associated with decreased likelihood of smoking (Burdette et al., 2012; Gillum & Sullins, 2008; Jesse & Reed, 2004; Mann et al., 2007), alcohol use (Kotrla, 2008; Page et al., 2009), and marijuana use (Page et al., 2009); and greater likelihood of better maternal nutrition (Burdette et al., 2012) during pregnancy.

Within the studies conducted with religiosity as a variable, several different measurements of religiosity were noted. One hundred thirty pregnant African American and White low-income women were interviewed to investigate health risk behaviors

during pregnancy (Jesse, Graham, & Swanson, 2006). Religiosity was measured by asking three questions on the importance of attending religious services from the Jarel Spiritual Well Being Scale (Hungelmann, Kenkel-Rossi, Klassen, & Stollenwerk, 1996). Jesse et al. (2006) reported that having lower levels of religiosity were a predictor of smoking in pregnant women ($OR = 0.87$, 95% CI [0.76-1.00]), however, the confidence level included 1 which makes this statistic not significant. Religion was not a significant predictor of substance use in this study. Using a similar measure of religiosity but including religious affiliation, Jesse and Reed (2004) studied 120 Appalachian pregnant women and similarly noted that lower levels of religiosity were associated with increased frequency of smoking ($r = -.24$, $p < .01$); again no association was noted with substance abuse and religiosity.

In 2005-2006, Mann et al. (2007) recruited 404 pregnant women from three southern U.S. obstetrical practices to study religiosity, spirituality, and tobacco use in pregnant women. Religiosity was measured by the Duke Religion Index and one question from the Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS). Overall religiousness was significantly associated with lower odds of recent tobacco use ($OR = 0.57$, 95% CI [0.39, 0.83]). When each religiosity variable was analyzed separately, organized religiosity, non-organized religiosity, self-rated spirituality, and self-rated religiosity were inversely associated with recent tobacco use. Mann et al. reported that daily spiritual experiences and intrinsic religiosity were not statistically significantly related to recent tobacco use in the analysis.

Several studies have investigated specific religious affiliations and health behaviors in pregnant women. Najman, Williams, Keeping, Morrison, and Anderson

(1988) studied religious affiliation and birth outcomes in Australia. Najman et al. (1988) noted religious groups such as Jehovah's Witnesses, Seventh Day Adventist, Assemblies of God, and Mormons practiced healthy behaviors during pregnancy such as eating breakfast more often, using less tobacco and marijuana use, and consuming less alcohol, tea, and coffee. However, after adjusting for cigarette and alcohol use, no significant association was noted with birth outcomes and the religious groups. Fonnebo (1994) reported increased birth weight and length in infants of Seventh Day Adventist mothers in Norway compared to matched control groups. Baron et al. (2013) conducted a prospective cohort study of 7865 pregnant women in The Netherlands including women who spoke Turkish, Arabic, Berber, or Dutch. They reported pregnant women with "no religion were five times more likely to smoke than those who were Islamic, 2.5 times more likely than those who belonging to a Protestant church and 1.5 times more likely to smoke than those who were Roman Catholic" (p. 3).

Several studies investigating religiosity were conducted using large databases with questions on religiosity that were part of the overall data collected. A longitudinal study, the Fragile Families and Child Wellbeing Study, was the source of data for a study by Burdette et al. (2012). Religiosity was examined by one question on how often a person attended religious services. In this study, increased frequency of religious service attendance was associated with lower odds of cigarette use ($OR = 0.860$, $p < 0.001$), lower odds of poor nutrition ($OR = 0.765$, $p < 0.001$), and lower odds of having a low-birth weight infant ($OR = 0.846$, $p < .05$). No association was noted between religious attendance and mental health, alcohol use, illicit drug use, and prenatal care. In addition

Burdette et al. reported that cigarette use mediated the effect of religious attendance on low birth weight by 11%.

Page et al. (2009) studied data from the National Survey of Family Growth, cycle 6, conducted by the National Center for Health Statistics from 2002-2003. The final sample size for analysis was 1,026 to 1,031 women who had been pregnant at some point in the previous 12 months. Three dimensions of religiosity in this study were religious or denominational affiliation, frequency of church attendance, and the self-report of the importance of religion in everyday life. Page et al. found that frequent religious attenders (several times per week) had lower odds of drinking alcohol ($OR = 0.19$, $p < .001$), smoking tobacco ($OR = 0.180$, $p < .001$), smoking marijuana ($OR = 0.210$, $p < .01$), and of reporting sexually transmitted infection testing or treatment ($OR = 0.621$, $p < .05$) compared to women who attended religious services less than one time per week. Page et al. conducted additional analyses (not reported in the article) that indicated race/ethnicity, age, socioeconomic status, and marital or relational status were not moderators between religious attendance and health risk behaviors. Self-report of the importance of religion in everyday life (religious salience) was not associated with health risk behaviors once religious attendance was entered into the statistical model, except that those with no religion still had an increased likelihood of drinking alcohol and smoking marijuana ($OR= 1.873$, $p < .01$; $OR = 2.118$, $p < .01$, respectively) compared to those with high levels of religious salience. Religious affiliation was also not associated with health risk behaviors after religious attendance was added to the statistical model, except that those with no religious affiliation were more likely to drink alcohol ($OR = 1.589$, $p < 0.01$), non-Christian religions were less likely to smoke cigarettes ($OR = .404$, $p < 0.01$) and

more likely to have multiple sex partners ($OR = 5.607$, $p < 0.001$) compared to conservative Protestant denominations (Page et al., 2009).

Gillum and Sullins (2008) also used the data from the National Survey of Family Growth, cycle 6 collected from 2002-2003 to investigate religiosity and smoking in pregnant women after adjusting for the following variables:  age, education less than 12 years, foreign born, income less than 200% poverty, and married.  Hispanic women who attended religious services were less likely to smoke during pregnancy (more than weekly attendance $OR$= 0.28, 95% CI [0.11, 0.73]; less than weekly attendance $OR$= 0.47, 95% CI [0.23, 0.97]) than women who never attended services.  Non-Hispanic European American women who attended religious services more than weekly were less likely ($OR$= 0.22; 95% CI [0.12, 0.39]) to smoke during pregnancy than women who never attended services.  Gillums and Sullins (2008) reported there was no association between smoking during pregnancy and African American pregnant women's attendance at religious services.

Several studies on fetal alcohol syndrome were conducted in Italy and South Africa.  In three studies, women who gave birth to infants with fetal alcohol syndrome (FAS) were less likely to self-report regular church attendance or prayer (May et al., 2005; Viljoen 2002) than women with children without FAS.  In the United States, Kotrla (2008) analyzed data from the 2001-2002 National Survey on Drug Use and Health to investigate prenatal alcohol use.  Kotrla used the terminology of spirituality and religiosity interchangeably in her report but measured "whether or not respondent's [*sic*] religious beliefs in-fluence [*sic*] her decisions" (p. 18).  She reported that religiosity was a protective factor against alcohol use during pregnancy among African American women;

however, the reported results were actually not significant ($\beta = -1.75$, 95% CI [-3.543, 0.039], $p < 0.055$).

May et al. (2006) interviewed eighteen Italian women whose children had Fetal Alcohol Syndrome and compared the results to a control group of women with children without Fetal Alcohol Syndrome. The study was conducted when the children were in first grade, therefore, it does not report maternal religiosity during their pregnancy. An interesting finding was that women who had children with Fetal Alcohol Syndrome reported higher levels of church attendance and adherence to religion than control groups (May et al., 2006). Unfortunately, the researchers did not identify the measurement tools used to identify these characteristics of religiosity. However, it is important to consider whether attendance of church provided a measure of support to the mothers of children with Fetal Alcohol Syndrome, or whether they did have higher levels of attendance at religious services during their pregnancy as well. Religiosity can provide a measure of support to some pregnant women; therefore, researchers have conducted studies to identify the associations between religiosity and stress.

**Religiosity and maternal stress.** Since pregnancy can be a stressful time for women, researchers have investigated how religiosity is associated with stress during pregnancy (Clements & Ermakova, 2012; Dalmida et al., 2010; Hamilton & Lobel, 2008; Mann et al., 2010). Mixed results have been reported regarding the association between religiosity and stress during pregnancy. While religiosity predicts lower levels of stress during pregnancy for some mothers (Clements & Ermakova, 2012), it has also been associated with increased stress during pregnancy in certain populations (Mann et al., 2010). Dalmida et al. (2010) found no association of stress with religiosity, but noted

pregnant women reported less perceived stress with increased daily spiritual experiences ($r = -.33$, $p < 0.006$).

Mann et al. (2010) conducted a research study with low income Hispanic pregnant and postpartum women who spoke either English or Spanish. Although it was anticipated that there would be an association between religiosity and stress in these women, no significant associations were identified in the Hispanic women who filled out the Spanish-language survey. However, in Hispanic women who completed the English-language survey, an unexpected result was noted. Private religious activities, being a religious person, religious attendance, and religio-spirituality, were associated with more negative stress in these women ($r$'s = .384, .317, .300, .341, all $p$'s < .05). In multivariate analysis (not shown in report), Mann et al. noted "overall religio-spirituality was associated with increased negative stress" (p. 652) in pregnant and postpartum Hispanic women who preferred the English-language survey. An example of negative stress was "In the last month, how often have you felt that you were unable to control the important things in your life?" (Mann et al., 2010, p. 649). Although causation cannot be inferred from these results, it could be possible that women with greater negative stress seek out religious experiences for comfort. However, the cause of this relationship is unknown and speculative only.

Clements and Ermakova (2012) studied 230 pregnant women enrolled in the Tennessee Intervention for Pregnant Smokers. These pregnant women represented all economic levels and 93% reported Caucasian race. Using Wong-McDonald and Gorsuch's (2000) Surrender Scale, the researchers reported surrender to God explained an additional 2.3% of the variance in Prenatal Psychosocial Profile (PPP) after

controlling for age, marital status, education, and number of children ($R^2$ change = .023, $F$ change (1, 215) = 5.50, $p$ = .02). In addition, Surrender ($\beta$ = -.15, $p$ = .02) was a predictor of prenatal stress in this sample population.

Hamilton and Lobel (2008) studied 285 pregnant women at a university hospital prenatal clinic to explore the type, patterns and predictors of coping with stress. They used the Revised Prenatal Coping Inventory (NuPCI) that included a section on spiritual –positive coping methods such as reading the bible, church attendance and prayers. Spiritual-positive coping was found to be used most often by the pregnant women in this study ($F$ (2, 620) = 289.21, $p$ < 0.001, with Tukey's honestly significant difference [HSD] post hoc analysis). In addition, Hamilton and Lobel reported religiosity and optimism were two predictors of whether women would use the spiritual-positive coping methods across all stages of the pregnancy, while pregnancy-specific distress predicted use of spiritual-positive coping in mid to late pregnancy, and lower socioeconomic status was predictive in late pregnancy.

**Religiosity and neonatal outcomes.** While many studies have been published researching the relationship between religiosity and maternal health behaviors, only one study was found in this literature review that investigated religiosity and neonatal outcomes. Dalmida et al. (2010) conducted a longitudinal study with 69 Latina pregnant women from the Atlanta area. Data were collected between 28-40 weeks of pregnancy and then once during the postpartum period. Religiosity was measured by 14 items from the Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS) and religious faith was measured using the Santa Clara Strength of Religious Faith (SCSRF) questionnaire. Dalmida et al. also measured spirituality with the Daily Spiritual

Experiences Scale. Only one religiosity variable was associated with infant birth weight in this sample. A negative relationship was identified between watching religious television and infant birth weight [$r = -0.32, p < 0.01$] (Dalmida et al., 2010). A positive association was noted between self-report of spirituality and gestational weeks at delivery [or infants closer to full term] ($r = .31, p < .014$). With hierarchical multiple regression analysis, after accounting for socio-demographic variables, smoking history, prenatal care, self-esteem, social support and social functioning, watching less religious television or less listening to religious radio was a predictor of higher infant birth weight [$\beta = .39$, $p = 0.003$] (Dalmida et al., 2010). Although no other religiosity/spirituality variable was significantly associated with infant birth weight, it is interesting to note that watching religious television/radio was inversely associated with frequency of church attendance ($r = -.49, p < .0001$) and only 9% of the sample reported watching religious TV/radio weekly (Dalmida et al., 2010). It is possible that women, who had limited activity due to some kind of pregnancy complication, watched religious TV to cope.

**Summary**

The majority of studies in this literature review indicated some aspects of religiosity were related to better health behaviors during pregnancy, although this was not the case with all women. Only one article was reviewed that studied religiosity and neonatal outcomes. It is clear that many other factors besides religiosity are associated with health behaviors during pregnancy, yet religiosity has been associated with positive health behaviors in some pregnant women. Therefore, additional research regarding religiosity will facilitate understanding of this important concept. Many of the articles identified in the literature review were older than five years emphasizing the importance

of continued research in this area.  Discovering new knowledge about the relationship between religiosity and health-promoting behaviors of pregnant women at Pregnancy Resource Centers was the purpose of this study.

## Gaps in the Literature

Women who attend Pregnancy Resource Centers may indicate they are experiencing an unintended pregnancy.  Though unintended pregnancies can be associated with poor maternal health behaviors, a pregnant woman's religiosity may be protective against poor health behaviors.  Through this literature review, no studies have been identified that look at the relationship between religiosity and health-promoting behaviors in pregnant women who may be experiencing an unintended pregnancy. Therefore, research with women who attended Pregnancy Resource Centers, Christian-based, community-driven organizations, will provide insight into the relationship between religiosity and health-promoting behaviors in these pregnancy women.

## CHAPTER III

## METHODOLOGY

### Introduction

The purpose of this study was to explore the relationship between religiosity and health-promoting behaviors of pregnant women at Pregnancy Resource Centers. The specific aims of the study were to: (a) describe the health-promoting behaviors of pregnant women at Pregnancy Resource Centers; (b) explore the relationship between each of the following sets of variables (religiosity, demographics, pregnancy-related variables, or services obtained at the Pregnancy Resource Center) and health-promoting behaviors of pregnant women at Pregnancy Resource Centers; and (c) determine the percentage of variance that religiosity explains in the health-promoting behaviors, above and beyond what the other variables explain, in pregnant women at Pregnancy Resource Centers. This chapter includes a detailed description of the design of this dissertation research study. The population and sample are described including the process for recruitment and retention of participants. The measures used in the study are specified and the procedures implemented in the study are detailed. The methods of data analysis are included as well as the process for protection of human subjects.

### Research Design

This descriptive correlational study was designed to explore the relationship between religiosity and health-promoting behaviors of pregnant women at Pregnancy

Resource Centers. A descriptive correlational research design was chosen because it does not attempt to manipulate or control variables, but examines relationships among variables, which may lead to hypotheses for further research studies (Grove et al., 2013). This study provided insight into the relationship between religiosity and health-promoting behaviors of pregnant women at Pregnancy Resource Centers.

## Study Population and Sample

### Sample Description

This sample consisted of pregnant women who visited Pregnancy Resource Centers in Eastern Pennsylvania. Fourteen Pregnancy Resource Centers in Eastern Pennsylvania were contacted to participate in the study. Eight Pregnancy Resource Centers agreed to participate. One of the Pregnancy Resource Centers had four sites; two centers had two sites each, thereby making a total of thirteen sites for data gathering. After agreeing to participate, one center director reported she was too busy and declined to participate in the study, reducing the actual study sites to seven Pregnancy Resource Centers with a total of eleven sites. The centers covered eight eastern Pennsylvania counties, including both rural and urban areas (see Table 1) (The Center for Rural Pennsylvania, 2014). Pregnancy Resource Centers were classified as rural when centers were located in school districts with 284 persons per square mile or fewer (The Center for Rural Pennsylvania, 2014).

Since pregnant women came to the Pregnancy Resource Centers from the surrounding areas and not only from the cities where the centers were located, it was determined a more accurate description of the Pregnancy Resource Centers' demographics would be obtained through evaluation of the demographics of the local

school districts.  Race and ethnicity for all of the centers was predominantly non-Hispanic White, though variations were noted based upon the centers' location (The Center for Rural Pennsylvania, 2014).  See Table 1 for race/ethnicity percentages of the communities based upon the location of the Pregnancy Resource Centers.

Table 1.  Characteristics of the Setting

| Pregnancy Resource Centers | County | Rural/Urban | Race/Ethnicity | | |
|---|---|---|---|---|---|
| | | | White % | Black % | Hispanic % |
| 1. | Lackawanna | Urban | 88.0 | 5.4 | 9.0 |
| 2. | Carbon | Rural | 98.1 | 0.5 | 1.7 |
| 3. | Monroe | Urban | 81.2 | 11.6 | 11.0 |
| 4. | Lehigh (2)* | Urban | 65.9 | 12.7 | 41.7 |
| | Northampton | Urban | 81.3 | 6.4 | 19.2 |
| | Northampton | Urban | 78.0 | 10.3 | 13.3 |
| 5. | Bucks | Urban | 95.6 | 4.2 | 1.2 |
| 6. | Berks | Rural | 95.8 | 2.1 | 3.1 |
| | Berks | Rural | 93.4 | 2.9 | 3.8 |
| 7. | Columbia | Rural | 92.5 | 4.3 | 2.9 |

*Note:*  Race/ethnicity data from The Center for Rural Pennsylvania (2014) was based upon the school districts where the Pregnancy Resource Centers were located.  An individual who reports Hispanic origin can be any race.
* Two centers were located in Lehigh County.

The Pregnancy Resource Centers were affiliated with Care Net International and were non-profit, community-based centers, offering pregnancy support services, and pregnancy or parenting education to women, men, and youth (Family Research Council, 2012).  Care Net International is a national Christian organization that includes a network

of more than 1,100 Pregnancy Resource Centers in the United States, offering on-site training, resources, and support to local centers (Care Net, 2013).

**Power Analysis**

Since there was no previous research to determine the effect size of religiosity in this population, a-priori power analysis was conducted. To be conservative, it was assumed that ten of the variables would be entered into the multiple linear regression model based on the findings of the preliminary univariate analysis with a $p$ value of $< .25$. The sample size estimate for multiple linear regression based on a rule of thumb formula $N \geq 50 + 8m$ [m= number of variables] (Green, 1991) to yield 80% power on a two tailed test with an alpha level of .05 was 130 subjects. However, Khamis and Kepler (2010) suggested $N \geq 20 + 5m$ as a formula to estimate minimum sample size for multiple linear regression with reliability as the criterion, for use in studies with "new variables or populations from which the quantities for an effective power analysis are not available" (p. 514). Using Khamis and Kepler's formula a minimum acceptable sample size would be 70 participants. Therefore, based upon consideration of each of these formulas, 100 participants were sought for this study. Upon completion of participant recruitment, 95 subjects were recruited, well above the minimum acceptable sample size suggested by Khamis and Kepler (2010). No refusal rate was obtained due to the anonymous nature of the data collection process. Nine surveys were not included in the data analysis, leaving the final $N = 86$. Of the nine deleted surveys, three participants were not yet 18 years old, one participant was no longer pregnant, two did not provide the number of weeks pregnant, one did not speak English, and two were deleted because the HPLP II instrument was not complete.

**Inclusion/Exclusion Criteria**

Inclusion criteria included: (a) pregnant women 18 years of age and older, (b) of any ethnic or racial group, (c) who had *known* they were pregnant for at least two months, (d) were able to read and write English, and (e) had visited a Pregnancy Resource Center. Exclusion criteria included any woman who had already delivered her baby. Volunteers who were familiar with the clients at the Pregnancy Resource Center were often aware if the clients met the inclusion criteria and would ask these particular women if they would like to participate in the study. In addition, a Research Information Form was the first document in the research survey (see Appendix A). The Research Information Form had a brief description of the study and the inclusion criteria listed, including how long the women had known they were pregnant. All potential subjects completed the Research Information Form to determine their eligibility for the study. Any surveys that were completed by women who did not meet the study criteria were not included in analysis.

<div align="center">

**Procedures**

</div>

**Sampling Procedures**

A consecutive sampling procedure was utilized to recruit pregnant women from the Pregnancy Resource Centers. Consecutive sampling is "recruiting *all* of the people from an accessible population who meet the eligibility criteria over a specific time interval, or for a specified sample size" (Polit & Beck, 2012, p. 278). Consecutive sampling provided an opportunity to recruit all the pregnant women who met the inclusion criteria from the accessible population of Pregnancy Resource Centers in eastern Pennsylvania over a period of forty and one-half weeks. Consecutive sampling may have helped eliminate bias from seasonal fluctuations since the sampling occurred

over a considerable period of time (Polit & Beck, 2012). Although one Pregnancy Resource Center had four possible sites for data collection, the participants in those sites were limited and were not overrepresented in the sample. Stratification was not included in the sampling procedure.

**Volunteer Training**

Women were recruited by the primary investigator (PI) or by volunteers at the Pregnancy Resource Centers. The volunteers were trained by the PI prior to seeking study participants. The training included a brief explanation of the research study including how to ask pregnant women if they were interested in participating in the research study. Emphasis was placed on the voluntary nature of the study, the importance of the privacy for the participants during the survey completion, and subtlety when providing the incentive gifts. The survey was provided in both online and paper formats, so the PI reviewed the online link for the survey and/or the paper survey process including the Research Information Form and the implied consent form. If only the paper format was used for data collection at a center, the online format of the survey was not discussed with the volunteers. Volunteers were informed that participants could call the PI with any questions and the phone number was provided on both the Research Information Form and the informed consent forms.

The Research Information Form was the first page of the study and listed the inclusion criteria, a brief description of the study as well as options including "I would like to take the survey now"; "I would like more information"; or "No thank you, I do not want to participate". For those who wanted more information, the phone number of the PI was provided so she could be contacted if she was not present. No participant names

were obtained on the Research Information Form.  Women who completed the survey online who did not meet the inclusion criteria were thanked for their time and notified that they were unable to participate in the study.  Several paper surveys were completed by participants who did not meet the inclusion criteria, and those were not included in the study.

**Recruitment of Participants**

Flyers about the study were available at each center.  The flyer had information about the study including a brief description and information about the small incentive gift.  When pregnant women came to the center, a volunteer or the PI asked them if they were interested in participating in a research study and gave them the informational flyer. If they were interested, they were taken to a private area designated for the research study.

Incentive gifts were provided to participants who agreed to participate in the study.  Women who participated in the study were given a small gift certificate worth five dollars or less after completing the survey; in addition they were notified that they could enter a drawing to win a $50 gift certificate by accessing a second internet site provided on the final page of the survey.  Pregnant women who completed the Research Information Form and were not qualified, were also provided a gift certificate valued at five dollars or less to thank them for their willingness to participate and for their time in completing the Research Information Form.

**Methods**

**Instrumentation**

The instruments used in this study are discussed below within the context of the

Pender's Health Promotion Model (Pender et al., 2011) and the specific variable being

measured.  The components of the Health Promotion Model being measured included the

individual characteristics and experiences, behavior specific cognitions and affect, as well

as the behavioral outcome (see Figure 1).

**Pender's Individual Characteristics and Experiences**

Individual characteristics and experiences influence the choices people make

related to health promotion and include the person's prior related behaviors and personal

factors (Pender et al., 2002, 2011).  The personal factor categories included in the study

are delineated below (see Figure 2) with the following instruments used to measure each

variable.

| **Individual Characteristics and Experiences** | **Behavior-Specific Cognitions and Affect** | **Behavioral Outcomes** |
|---|---|---|
| Personal factors: demographic data, pregnancy-related, and religiosity | Interpersonal Influences: services received at the Pregnancy Resource Center and religiosity | Health-Promoting Behavior (measured by Revised Health-Promoting Lifestyle Profile II) |
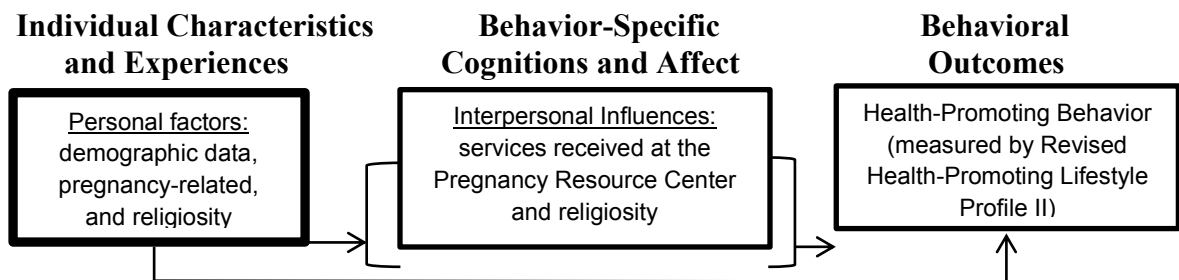
Figure 2.  Revised Health Promotion Model for study of pregnant women at Pregnancy
Resource Centers**:** Highlighting individual characteristics and experiences.

**Demographic data.**  Demographic data were obtained by self-report and included

age, race and ethnicity, marital status, socioeconomic status, and education level (see

Appendix B).  Maternal age at the time of the study was measured in years.  Maternal

race or ethnicity was categorized according to the 2012 United States Census Bureau

questionnaire (U.S. Department of Commerce, United States Census Bureau, 2012).

Marital status included seven categories including: married; never married not living with

partner; never married living with partner; divorced not living with partner, divorced

living with new partner, separated, or widowed. Socioeconomic status was measured by

total household income in the past year from all sources. Educational level was measured

by the following questions: "What is the highest grade you completed?", "Years of

college attended?", and "Highest degree earned?"

**Pregnancy-Related variables.** Pregnancy-related data that were obtained

included the gravidity (how many times pregnant including the current pregnancy), parity

(how many live births), how many weeks pregnant (calculated from last menstrual

period), length of time the woman knew she was pregnant (in weeks), and pregnancy

intention.

Pregnancy intention was determined through the use of the question from the

Pregnancy Risk Assessment Monitoring System (PRAMS) questionnaire (CDC, 2009)

with slight modification to reflect the timing of the questionnaire prior to the delivery of

the newborn and two additional responses. No validity or reliability reporting was found

for the PRAMS survey, although it is administered by the CDC and state health

departments to collect data regarding maternal behaviors of women who have live births

in the United States (CDC, 2014b). Ayoola (2008) noted the "validity of the PRAMS

survey varies by items, since the items measure different constructs. There is no report of

criterion-related validity" (p. 42). See Ayoola (2008) for additional comments on

reliability and validity of PRAMS.

However, the pregnancy intention question on the PRAMS is frequently used by researchers as a measurement of pregnancy intention (Chisolm et al., 2013, 2014; Cheng et al., 2009; Humbert et al., 2011; Mohllajee et al., 2007; Terplan et al., 2014).  For this study, the pregnancy intention question was:  "In this current pregnancy, how do you feel about being pregnant?"  Optional responses included: ''I wanted to be pregnant sooner'' (intended or wanted pregnancy); ''I wanted to be pregnant now'' (intended or wanted pregnancy); ''I wanted to be pregnant later'' (mistimed pregnancy); ''I did not want to be pregnant now or at any time in the future'' (unwanted pregnancy).  Rather than including, "I don't know" as a measure of ambivalence, the response was changed to ''I am unsure how I feel'' [unsure about intendedness] as previously reported by Orr et al. (2008, p.546).  In addition, because women can change their minds regarding their feelings about the pregnancy, even while pregnant, an additional question asked "I did not want to be pregnant, but now I'm glad I am" (unintended pregnancy).  In this study, unintended pregnancies included mistimed, unwanted, unsure, and pregnancies reported as unwanted but now the pregnant woman was glad she was pregnant.  Each of these categories included women who did not intend to be pregnant at the time of conception.

**Religiosity.**  Religiosity was measured with two instruments, the Duke University Religion Index [DUREL] (Koenig & Büssing, 2010; Koenig et al., 1997) and the Religious Surrender and Attendance Satisfaction Scale (Cyphers & Clements, 2015), and one question on religious affiliation.

***The Duke University Religion Index.***  The Duke University Religion Index (DUREL) is comprised of three subscales (Koennig & Büssing, 2010; Koenig et al., 1997).  DUREL subscale one, organized religiosity, is measured by ascertaining

frequency of religious attendance on a 6-point Likert scale.  DUREL subscale two, non-organized religiosity is measured with a 6-point Likert scale asking about private religious activities, such as prayer and bible study.  Subscale three, intrinsic religiosity, is measured by asking three questions on a 5-point scale (Koenig & Büssing, 2010; Koenig et al., 1997).  The questions in the Duke University Religion Index are listed in Appendix C.  Permission to use the Duke University Religion Index was obtained from the author (see Appendix D).

*Reliability and validity.*  "The overall scale has high test-retest reliability (intra-class correlation = 0.91), high internal consistency (Cronbach's alpha's = 0.78–0.91), high convergent validity with other measures of religiosity (r's = 0.71–0.86)" (Koenig & Büssing, 2010, p.78).  In this dissertation study the Cronbach's alpha for the subscale three (intrinsic religiosity) was .872.  Internal consistency was not calculated for subscale one (organized religiosity) and subscale two (non-organized religiosity) since these subscales are single items.

*Scoring.*  The Duke University Religion Index is scored in subscales to avoid multicollinearity in subscale scores.  The DUREL scale was dichotomized to separate those who score high on the religiosity variable from those who scored lower.  Therefore, DUREL subscales 1 and 2 were dichotomized with 1-4 indicating low religiosity, and 5-6 indicating higher religiosity. DUREL subscale 3 was dichotomized with 3-11 indicating low religiosity and 12-15 indicating higher religiosity.

**Religious Surrender and Attendance Satisfaction Scale.**  The Religious Surrender and Attendance Satisfaction Scale (RSASS) is a very brief scale that measures religious commitment and a person's satisfaction with their commitment (Cyphers &

Clements, 2015). The RSASS includes three questions, one question on the frequency of

attendance at religious services, and two additional questions related to surrender to God.

Each question is rated on a 5-point Likert scale with higher numbers indicating stronger

religious commitment. Each question is followed with "how do you feel about your

rating on this item". The questions for the RSASS are listed in Appendix E.

*Reliability and validity.* In a study by Cyphers and Clements (2015), the

Religious Commitment component of the scale (RSAS-3; Clements et al., 2013)

demonstrated strong internal consistency ($\alpha$ = .85) and was strongly associated with

intrinsic religiosity ($r$ = .65, $p$ =<.005). The Satisfaction items from the RSASS were

found to be moderately internally consistent ($\alpha$ = .68). In addition, the Satisfaction items

were found to have demonstrated adequate construct validity (Cyphers & Clements).

This modestly supports the idea that individuals are not responding about their

satisfaction with Religious Commitment to be socially desirable, or look good to others

(Cyphers & Clements).

In this dissertation study, the Religious Commitment component of RSASS had

an internal consistency of $\alpha$= .721. However, the internal consistency for the overall

Satisfaction component of RSASS was $\alpha$= .498. Analysis of satisfaction with religious

commitment was therefore conducted on two subscales of Satisfaction including

Satisfaction with surrender to God (question 1 and 2 on Religious Commitment

component of RSASS) and Satisfaction with religious attendance.

*Scoring.* The scoring of the RSASS included two processes. For the Religious

Commitment component (including the two surrender to God questions and one religious

service attendance question) questions with answers of "very often or always true of me"

or attending religious services at least weekly were scored as high religiosity. The Religious Commitment subscale was summed and then dichotomized for those with 0 or 1 to be low religious commitment and those with 2 or 3 to be high religious commitment. The Satisfaction component was scored as those who were satisfied with their responses and those who were unsatisfied (either desiring more or less religious commitment). Answers to Satisfaction questions one and two were totaled and individuals with a score of 2 (satisfied with responses on both questions) were considered to be satisfied with their surrender to God. Satisfaction with religious service attendance was scored as either satisfied or not satisfied.

*Religious affiliation.* The final question on religiosity asked the participant to identify their religious affiliation. The question stated "What is your religious preference?" with responses including Protestant (specify denomination); Catholic; Jewish (specify Orthodox, Conservative, Reform; none of these); Muslim; other (please specify); and No religion.

**Pender's Behavior-Specific Cognitions and Affect**

Behavior-specific cognitions and affect are motivational factors for health promotion (Pender et al., 2011). This study focused on interpersonal influences, which are the behaviors, beliefs, or attitudes of others that influence a person regarding health promotion (Pender et al., 2011). The behavior-specific cognitions and affect factors (see Figure 3) included in the study are delineated below with the following instruments used to measure each variable.

| Individual Characteristics and Experiences | Behavior-Specific Cognitions and Affect | Behavioral Outcomes |
|---|---|---|
| Personal factors: demographic data, pregnancy-related, and religiosity | Interpersonal Influences: services received at the Pregnancy Resource Center and religiosity | Health-Promoting Behavior (measured by Revised Health-Promoting Lifestyle Profile II) |
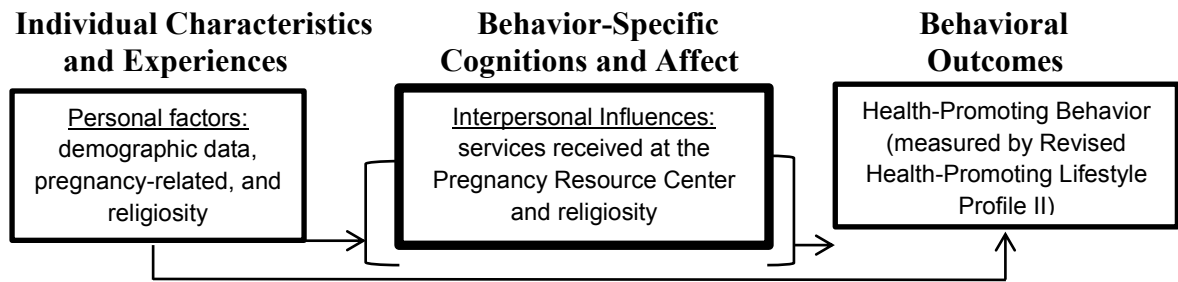
Figure 3.  Revised Health Promotion Model for study of pregnant women at Pregnancy Resource Centers**:**  Highlighting interpersonal influences.

**Services at the Pregnancy Resource Center.**  A survey question was added asking what services the pregnant woman had used at the Pregnancy Resource Center during this pregnancy.  Several options were listed including: Medical Services (pregnancy test, ultrasound); Bible Study (or any biblically based parenting class); Classes (parenting, healthy relationships, life skills); Supportive Services (*Earn While You Learn* [Heritage House '76, 2014], counseling); and None.  In addition, the pregnant women were asked how many times they participated in these services.

**Religiosity.**  Religiosity was measured through the Duke University Religion Index (Koenig & Büssing, 2010; Koenig et al., 1997) and the Religious Surrender and Attendance Satisfaction Scale (Cyphers & Clements, 2015), and one question on religious affiliation. See religiosity variables described above under Pender's individual characteristics and experiences section.

**Pender's Behavioral Outcome: Health-Promoting Behavior**

Health-promoting behaviors of pregnancy is the behavioral outcome in the Health Promotion Model (Pender et al., 2002).  Health-promoting behaviors were measured by the Health-Promoting Lifestyle Profile II [HPLP II], as noted in the Revised Health

Promotion Model for this dissertation study (see Figure 4). The description of the HPLP

II is provided below.

| **Individual Characteristics and Experiences** | **Behavior-Specific Cognitions and Affect** | **Behavioral Outcomes** |
|---|---|---|
| Personal factors: demographic data, pregnancy-related, and religiosity | Interpersonal Influences: services received at the Pregnancy Resource Center and religiosity | Health-Promoting Behavior (measured by Revised Health-Promoting Lifestyle Profile II) |

Figure 4. Revised Health Promotion Model for study of pregnant women at Pregnancy
Resource Centers**:** Highlighting behavioral outcomes.

**Health-Promoting Lifestyle Profile II.** Although several versions of modified

HPLP II for pregnant women were noted in the literature (Gharaibeh et al., 2005; Lin et

al., 2009; Thaewpia et al., 2013), other researchers have used the HPLP II without

revisions for pregnant women (Bond et al., 2002; Mendelson et al., 2008; Smith &

Michel, 2006; Stark & Brinkley, 2007). The authors of the HPLP II requested the tool be

used in the original format rather than being revised for use for pregnant women (S.

Walker, personal communication, November 14, 2013). Therefore, the HPLP II was not

revised for this study. However, a brief statement was added to the directions of the

HPLP II indicating all questions related to exercise *refer to exercises appropriate for*

*women during pregnancy that do not overexert or exhaust a pregnant woman* (American

College of Obstetricians and Gynecologists, 2002, 2011). Questions on the HPLP II

instrument are included in Appendix F. Permission to use the HPLP II was provided by

the authors (see Appendix G).

*Reliability and validity.*  The original HPLP II is a 52-item scale with six

subscales including; health responsibility, interpersonal relations, spiritual growth,

physical activity, nutrition, and stress management.  Each item is rated on a 4-point

Likert scale, ranging from 1 (never) to 4 (always) and scoring is based on the mean of the

responses overall and within the subscales.  Factor analysis confirmed the six-

dimensional structure of the health-promoting lifestyle and construct validity was

supported by "convergence with the Personal Lifestyle Questionnaire ($r = .678$), and by a

non-significant correlation with social desirability" (Walker & Hill-Polerecky, 1996,

para. 1).  Criterion-related validity was determined by "significant correlations with

concurrent measures of perceived health status and quality of life [$r$'s $= .269$ to $.491$]"

(Walker & Hill-Polerecky, 1996, para. 1).  Reliability of the total scale's internal

consistency was supported by an alpha coefficient of .94; alpha coefficients for the

subscales ranged from .79 to .87, and the 3-week test-retest stability coefficient for the

total scale was .89 (Walker & Hill-Polerecky, 1996).  In this dissertation study, the total

HPLP II scale's internal consistency was confirmed with a Cronbach's alpha of .94.

*Scoring.*  Overall health-promoting behaviors were determined by summing the

HPLP II scores and obtaining the mean of the scores.  Higher mean scores for HPLP II

indicates higher health-promoting behaviors.  Subscales for the HPLP II include health

responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and

stress management.  Each subscale score was summed and then a mean score was

obtained on each subscale (Walker, 1995).

**Pilot Study**

Prior to implementing the study, a pilot study was conducted to determine whether an online format or paper format would be the most effective mechanism for delivering the survey for this population. Therefore, the survey was provided online for five participants and in paper format for five participants prior to initiating this study. The questions for the survey remained the same whether the format was paper or online. Several concerns were identified in the pilot study including the possibility that the internet service might be disconnected or be unavailable during the time a survey could be completed. Therefore, paper surveys were also provided to each center to assure successful data collection if the internet became unavailable. In addition, all of the Pregnancy Resource Centers requested to use paper surveys when the PI was not present as they believed this would be less cumbersome for the volunteers.

During the pilot study several participants also had questions about some of the questions in the survey. To assure the participants' understanding of the RSASS questions, explanatory statements were added for clarification of terms in two questions of the RSASS following consultation with Dr. Andrea Clements, co-author of RSASS. The question explanations included: "When my understanding of a problem conflicts with God's revelation (this means that God showed you something), I will submit to God's definitions", and "Although I may not see results from my labor (this means work that you do. It's not talking about birthing a baby), I will continue to implement God's plans as long as God directs me to do so".

Finally, during the pilot study it became apparent that additional Pregnancy Resource Center sites would be necessary in order to assure timely data collection.

Therefore, additional centers were sought in eastern Pennsylvania. Of the fourteen centers contacted, five centers declined to participate citing concerns related to the busyness of the centers and one center was concerned the pregnant women would not be able to participate due to educational barriers. As mentioned previously, one center agreed to participate and then declined due to the busyness of the director and lack of volunteers to assist in data collection.

**Data Collection**

Data collection began February 26, 2014 and continued until December 8, 2014, when an appropriate sample size was obtained. Informed consent, survey completion, and data management will be discussed below.

**Informed consent.** Pregnant women, who met the inclusion criteria, and who indicated "I would like to take the survey now" were automatically linked to the next page of the survey to read the implied informed consent form in the computer version of the survey or they were directed to continue to the next page for the information on informed consent in the paper version (see Appendix H). The implied informed consent included statements such as there were no anticipated risks (including risk to the fetus), the voluntary nature of the research study, the right to withdraw from the study at any time, and expected benefits. The PI's contact information was provided on the implied informed consent page in case the participant had questions. The informed consent was implied when the survey was begun by the participant and no participant names were written on any of the implied consent forms to assure anonymity. If the woman chose to participate in the study, she was informed to continue onto the next page in both paper and online formats.

**Survey completion.** When pregnant women came to the center, a volunteer or the PI asked them if they were interested in participating in a research study and gave them the informational flyer. If they were interested, they were taken to a private area designated for the research study. The survey was provided with the Research Information Form, implied informed consent, and survey questions included. The time for completing the survey was approximately 15 minutes, although volunteers reported some participants took longer than 15 minutes for completion of the survey.

Upon completion of the survey, each woman was given the opportunity to enter a drawing to win a $50 gift certificate. The woman provided either an e-mail or mailing address that was entered into the drawing to win the gift certificate. In the online format, a separate link was provided to the women for the option of entering the drawing. For women who completed the paper version of the survey, a page was added after the survey for the woman to enter the drawing. This page was removed from the survey by the PI and the information was placed in the online drawing. The contact information collected for the drawing was not linked to the survey results in any way. When the data collection was completed, one name was randomly chosen for the gift certificate drawing. The winner of the gift certificate was notified through postal mail service and the gift certificate was picked up at the Pregnancy Resource Center of the recipient's choice.

**Data management.** When the participants completed a paper survey and the PI was not present, the completed survey was placed in a sealed envelope by the participant and was then placed in the Pregnancy Resource Center director's office until the PI was able to retrieve the completed surveys and drawing information. The information was locked in the director's office when the center was closed. When the PI collected the

survey and drawing information, the information was entered into Qualtrics and then the paper versions were shredded. Data from the electronic surveys were maintained on a secure internet server. No personally identifying information or IP addresses were saved with the survey results. Back up electronic data files were kept in a secure online cloud server.

## Data Analysis

The Statistical Package for Social Sciences version 22.0 (SPSS) was used to analyze the data in this study. Data were uploaded to SPSS directly from the secure server. The dependent variable was the Health-Promoting Lifestyle Profile II, including both the total score and subscale scores. The independent variables included demographic variables, pregnancy-related variables, services received at the Pregnancy Resource Centers, and the religiosity variables.

In order to assure the most accurate statistical analysis of the data, the data were screened and cleaned prior to analysis, including assuring the accuracy of the data, identifying missing data, outliers, and assuring the assumptions were met for the statistical analysis techniques. Using SPSS, frequencies were conducted to identify any unusual data (not an expected value) and to check for missing data. Any unexpected values were analyzed and corrected as appropriate to the data intention (for example, 6-8 autocorrected to Jul-8). Evaluation of missing data is described below.

### Missing Data

Missing data were analyzed using the Missing Values Analysis in SPSS 22. Little's MCAR (Missing Completely at Random) was conducted on all of the variables in the data set and was statistically significant (Little's MCAR= Chi Square= 54.017;

*df* = 27, p= .002), indicating the missing data were not missing at random. Therefore, Independent *t*-tests and chi-square tests were conducted on all of the variables to determine if any had significant relationships to the missing data on the dependent variable [HPLP II] (El-Masri & Fox-Wasylyshyn, 2005; Tabachnick & Fidell, 2013). The Hispanic ethnicity variable was statistically significant ($\chi^2$ = 7.733, p < .04) indicating there was systematic missingness in the HPLP II variable by pregnant women who were of Hispanic ethnicity.

When the pattern of missing data is systematic, data should not be arbitrarily deleted as further analysis of the data is important (Tabachnick & Fidell, 2013).  In addition El-Masri and Fox-Wasylyshyn (2005) noted invalid results can occur if missing data are handled inappropriately when they are Missing Not at Random. Therefore, careful consideration was made regarding the method of addressing missing data in this data set.  Case mean substitution was chosen to impute the data from the missing values in the dependent variable, HPLP II (eight single question responses), as well as for the DUREL Subscale 3 (two responses) and the Religious Satisfaction and Surrender Scale (one response).  Case mean substitution is based upon the assumption that within a particular case, the responses of one item in a survey are closely related to the other responses (El-Masri & Fox-Wasylyshyn, 2005).  Therefore, for responses missing in the HPLP II, DUREL Subscale 3, and RSASS, a mean for the subscale scores within the case was obtained and imputed for the missing value within the subscale. Estimation Maximization through the Missing Value Analysis in SPSS-22 was used to impute the three missing values for age.  One datum was missing from five categorical variables (Race, religious affiliation, total income, Hispanic ethnicity, and marital status).

The mode was calculated for each variable and imputed for the missing data in those categories.

Screening data continued by looking at variables for cases with outliers, extreme values for the variable (Tabachnick & Fidell, 2013). One participant's responses were considered outliers in the total number of pregnancies and live children, reporting ten total pregnancies and six live children. Since this case is from the intended population it represents additional variability within the population indicating the population is outside of a normal distribution and the values were retained (Tabachnick & Fidell, 2013).

**Data Analysis Description**

Descriptive statistics were performed for each variable, including frequency distributions for all variables, and mean, range, standard deviation, median and mode. The data were analyzed using a two tailed alpha of 0.05. Data analysis for each specific aim is delineated below.

**Specific Aim # 1.** Describe the health-promoting behaviors of pregnant women at Pregnancy Resource Centers. The mean scores, range, and standard deviations were calculated for the Health-Promoting Lifestyle Profile II (HPLP II) as well as mean scores, range, and standard deviations for each subset within the scale. The higher the score obtained on the HPLP II, the better the health-promoting lifestyle of the pregnant woman.

**Specific Aim # 2**. Explore the relationship between each of the following sets of variables (religiosity, demographics, pregnancy-related variables, or services obtained at the Pregnancy Resource Center) and health-promoting behaviors of pregnant women at Pregnancy Resource Centers. The overall Health-Promoting Lifestyle Profile II scores and each subscale were compared for all variables with categorical data (three or more

categories) through use of Analysis of Variance [ANOVA] (Field, 2009). The ANOVA

with post hoc analysis examined differences between health-promoting behaviors in each

category of the variables to determine if the differences were statistically significant at

alpha < 0.05. Independent *t*-tests were used to examine the mean differences in the

HPLP II scores and categorical data in two groups. These tests identified which variables

were related to health promotion in pregnant women and the strength of the relationship.

Exploring the relationship between the subscales of the HPLP II and the

independent variables was conducted using the statistical method appropriate for each

variable. The subscales Health responsibility and Nutrition were normally distributed

and Independent *t*-tests and ANOVA were utilized to analyze the relationships between

the independent variables and these two subscales. The remaining four subscales

Physical Activity, Interpersonal Relations, Spiritual Growth, and Stress Management

were not normally distributed and nonparametric testing was used to explore the

relationships between the independent variables and these four subscales. The Mann

Whitney U test was used to compare median scores for dichotomous variables and the

subscale scores of HPLP II (Field, 2009). Kruskal-Wallis test was used for the variables

with three or more categories to rank the scores and compare these with the subscale

scores on the HPLP II (Field, 2009).

**Specific Aim # 3**. Determine the percentage of variance that religiosity explains

in the health-promoting behaviors, above and beyond what the other variables explain, in

pregnant women at Pregnancy Resource Centers. A blocked stepwise multiple linear

regression was used to explore the independent relationship between religiosity and

health promotion practices after controlling for the other variables. Categorical variables

and non-normal continuous variables were dichotomized to assure two categories for each variable for multiple linear regression (see Appendix I). To assure a parsimonious model, any variable with a univariate comparison with health-promoting behaviors that had an alpha greater than 0.25 was not entered into the model (Hosmer & Lemeshow, 2000). All variables with alphas less than 0.25 were entered into block one of the stepwise multiple linear regression, except for the religiosity variables. In block two of the stepwise multiple linear regression, the religiosity variables that had a univariate comparison with health-promoting behaviors with a $p < 0.25$ were entered into the model (Hosmer & Lemeshow, 2000). In each block of the multiple linear regression, a stepwise method of analyzing the variables was chosen to determine which of the variables were most effective in explaining the variance in that particular step of the multiple linear regression.

Separate multiple linear regressions were conducted for each religiosity variable based upon the assumption that different religiosity variables may eliminate the effects of one another since different types of religiosity may have opposite associations with one health-related variable (Koenig & Bussing, 2010), and it is generally recommended that dimensions of religiosity be analyzed separately for effects on health (Fetzer Institute, National Institute on Aging Working Group, 2003). Therefore, separate multiple linear regressions were conducted with block one independent variables entered first in a stepwise approach, and then each religiosity variable entered separately into block two.

Assumptions of the multiple linear regression model were evaluated including the following: multivariate normality (normality, linearity, and homoscedasticity between obtained and predicted residual scores with histograms and normal probability plot);

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multicollinearity (using variance inflation factor and tolerance to assure there was no multicollinearity between the predictor variables); multivariate outliers (Mahalonobis distance, Cook's distance, and leverage to determine if the outliers were significant); independence of errors [Durbin-Watson test to determine whether the residuals in the model were independent or uncorrelated] (Tabachnick & Fidel, 2013). All of the assumptions of the multiple linear regression were met. Normality testing indicated the dependent variable, HPLP II, was normally distributed. Variables that did not have normal distribution were dichotomized for data analysis with multiple linear regression.

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**Limitations**

</div>

Limitations were identified in the research design of this study. These limitations will be discussed as well as the processes used to minimize the limitations in the study.

**Selection Bias**

Selection bias was concern with the research design for this study due to several factors. Since the estimated sample size was 100 people, it was difficult to obtain a large enough group of participants to randomize the sample selection. Therefore, nonprobability procedure of consecutive sampling was used, thereby introducing the possibility of selection bias. However, since Pregnancy Resource Centers were available to all pregnant women, regardless of their religion or any other demographic factor, it was appropriate to assume that this sample was representative of women who visit Pregnancy Resource Centers, the population for this study.

**Recruitment.** In addition, selection bias could have been introduced into the study because the women willing to participate may have been those who were more religious to begin with or those who engaged in more health-promoting behaviors. To

reduce this selection bias, volunteers were asked to invite all pregnant women who visited the Pregnancy Resource Centers and met the inclusion criteria to participate in the research study. In addition, volunteers were trained by the PI and provided a detailed explanation of the study to assure consistency and a systematic approach when seeking study participants. However, volunteers occasionally reported they forgot to ask the woman, or forgot about the study, or thought the woman was too busy or distraught to ask to participate in a research study. On-going reminders of recruitment procedures were provided to Pregnancy Resource Center directors and volunteers in an attempt to reduce selection bias. Consistent interaction with the volunteers at the center was necessary to motivate volunteers in sample recruitment. The PI rotated through each center to assist in participant recruitment, encourage the volunteers, and provide additional support as needed. Having volunteers assist in data collection, while convenient, became a limitation in lack of control over the recruitment process. Overall though, the centers attempted to be consistent in requesting women to participate in the studies.

**Refusal rate.** Center directors were asked to keep a count of any women who refused to participate or were not asked to participate to calculate the refusal rate of the study. Unfortunately, the Pregnancy Resource Center directors were unable to document the women who refused to participate, as some of the pregnant women would report they would complete the survey upon the next visit. Since the surveys were anonymous, there was no way to confirm that the pregnant women completed the survey at the next appointment.

**Language barrier.** An initial decision to provide the survey in English only, became a limitation as additional Pregnancy Resource Centers were added to the research study. The first research site indicated that although thirty-four percent of the women who visited the Pregnancy Resource Center were Hispanic according to internal demographic collection, most of those women did speak English (I. Williams, Program Director, personal communication, October 15, 2013). However, when additional research sites were added to the study to assure the necessary research participants, not having the survey offered in Spanish did become a concern at several centers. Nevertheless, based upon the initial feedback from center directors, it was determined that having the survey in English only was an appropriate design decision.

**Social Desirability Bias**

As noted by Polit and Beck (2012), when self-report instruments are used in research studies, participants may have a social desirability response bias. Women at the Pregnancy Resource Centers may have been more likely to report positive health-promoting behaviors just to place themselves in a more positive light to others. However, since the surveys were anonymous and the volunteers did not stay in the same room with the pregnant women while they completed the surveys, it is less likely that response bias was a concern in this research study.

**Homogeneous Population**

Limiting the population to pregnant women at Pregnancy Resource Centers limited the generalizability of the study to the relatively homogeneous population. However, the study was intended to investigate this vulnerable population at Pregnancy Resource Centers and therefore this limitation was appropriate. In addition, using seven

different centers with eleven sites in eight Pennsylvania counties provided for some heterogeneity within this specific population. Since these centers were all part of the same Pregnancy Resource Center affiliation (Care Net), there was little concern regarding lack of standardization among centers.

### Ethical Considerations and Protection of Human Subjects

Vulnerability perspectives illuminate the complexity and the ethical concerns associated with research in this population. Pregnant women are considered a vulnerable population "because of risks to their unborn children" (Schwenzer, 2008, p. 1343). Women who visit Pregnancy Resource Centers may have increased vulnerability due to social or economic factors (Aday, 2001). Prior to conducting this study at the Pregnancy Resource Centers, the researcher completed volunteer training at one of the Pregnancy Resource Centers. Study procedures were reviewed with the directors and program directors at each center to assure the best possible experience for the women who participated.

In this study, there were no anticipated physical, social, legal, or psychological risks to the pregnant woman or her fetus. It was anticipated that for some pregnant women, participation in a survey on health practices during pregnancy could elicit emotional responses but no more than a pregnant woman might experience in day to day life. In addition, to minimize inconvenience, the women completed the survey at the Pregnancy Resource Centers.

Race/Ethnicity was not the focus of this study; however, pregnant women of all races/ethnicities were invited to participate in the study. The racial diversity within the centers varied based upon the location of the center in eastern Pennsylvania. Although

consecutive sampling was utilized for this study, assurance of minority distribution was not incorporated into the study design.

Protection of the autonomy within a vulnerable population is imperative for researchers working with vulnerable populations. Therefore, researchers working with pregnant women must follow Federal Guidelines for the Protection of Human Subjects, 45 CFR part 46 subpart B (U.S. Department of Health and Human Services, 2009). The federal guidelines require that informed consent includes information on any foreseeable risk to the fetus. Since no foreseeable risk was associated with this research, and there was no specific requirement at the University of North Dakota's Institutional Review Board (IRB) regarding exemption with pregnant women, an exempt status was obtained for this study (University of North Dakota, 2004). Exempt status allowed for anonymity since no names were collected with the surveys. However because of the vulnerable status of the pregnant women, when implied informed consent was requested, clear explication of the informed consent procedure was included to assure the participants' autonomy was protected.

Institutional Review Board (IRB) approval was obtained from the University of North Dakota (see Appendix J). In order to be diligent in assuring the ethical treatment of the women in this vulnerable population, all participants were apprised of the following on the implied informed consent: there were no anticipated risks (including risk to the fetus), the voluntary nature of the research study, the right to withdraw from the study at any time, and expected benefits. In addition, participants were notified that information regarding the study results would be provided to the Pregnancy Resource Centers upon completion of the study. Participants were provided the contact

information for the PI with the implied informed consent in case the participant had questions. The informed consent was implied when the survey was begun by the participant.

The potential benefits outweighed the potential risks in this study. Each participant received a small gift valued at five dollars or less and could choose to enter to win a $50 gift certificate as a token of appreciation. A potential benefit to the participants included the knowledge that the findings of this study may help Pregnancy Resource Center personnel understand the relationship between religiosity and other factors to health practices during pregnancy, thereby improving services to clients. An additional potential benefit to the participants included the understanding that this research can benefit all pregnant women, including women who seek services at faith-based community centers, such as churches and Pregnancy Resource Centers. The risks associated with the proposed study were no more than anticipated in day to day life. However, the possible positive implications for healthier mothers and healthier babies were significant.

Data collected in the study were stored on a secure internet server with online backup in a secure cloud server. Electronic files were password-encoded to maintain privacy during data analysis. No identifying information was maintained with the data. Research data will be maintained in the secure online cloud server for three years after which it will be destroyed. Additional details of data management are provided under the Data Management section above.

**Summary**

This chapter reviewed the research design including the population and sample, instruments and methods, procedures for data collection and data analysis, as well as the limitations identified in the research design. Ethical considerations for human subjects research were discussed including processes for protection of human subjects. The descriptive correlation approach provided the researcher with the opportunity to explore the relationships between religiosity, other factors, and health-promoting behaviors in pregnant women at Pregnancy Resource Centers. The findings from this study will provide a foundation for further research to determine whether a causal relationship exists between religiosity and health-promoting behaviors in pregnant women. The next chapter will describe the data obtained in this study and provide analyses of the data and the results of those analyses.

## CHAPTER IV

## RESULTS

### Introduction

The Health Promotion Model [HPM] (Pender et al., 2002, 2011) guided this study exploring the relationship between religiosity and health-promoting behaviors in pregnant women at Pregnancy Resource Centers (Pender's Revised Health Promotion Model, see Figure 1). The specific aims included: (a) describe the health-promoting behaviors of pregnant women at Pregnancy Resource Centers; (b) explore the relationship between each of the following sets of variables (religiosity, demographics, pregnancy-related variables, or services obtained at the Pregnancy Resource Center) and health-promoting behaviors of pregnant women at Pregnancy Resource Centers; and (c) determine the percentage of variance that religiosity explains in the health-promoting behaviors, above and beyond what the other variables explain, in pregnant women at Pregnancy Resource Centers. This chapter will present the results of this research study including details of the demographic characteristics of the sample, the analysis of the specific aims, and a summary of the results.

### Descriptive Data

A total of 95 pregnant women completed surveys to participate in this research study. Nine surveys were not included in the data analysis, leaving the final number of participants at 86 pregnant women. Of the nine deleted surveys, three participants were

not yet 18 years old, one participant was no longer pregnant, two did not provide the number of weeks pregnant, one did not speak English, and two were deleted because the HPLP II instrument was not complete.  The ages of the pregnant women who participated in the study ranged from 18 to 39 years, with a mean of 25.6 years ($SD$ = 5.0).  Eighty three ($n$ = 71) percent of the participants in the study were White.  Eight percent of participants reported they were Black ($n$ = 7), 1% were Asian ($n$ = 1), and 8% reported other ($n$ = 7).  Nine percent ($n$ = 8) of the pregnant women indicated they were biracial, 1% were multiracial, ($n$ = 1), and 17% ($n$ = 15) indicated they were of Hispanic ethnicity.

Pregnant women in this study varied in their marital status.  Thirty-seven percent ($n$ = 32) reported they were never married living with their partner, followed by 30% ($n$ = 26) who indicated they were married and 28% ($n$ = 24) who reported they were never married and not living with their partner.  One person (1%) was divorced living with a new partner, and three (4%) were separated.

Although it was expected that some women at the Pregnancy Resource Centers would have lower incomes, one unexpected finding was that the largest percentage of the pregnant women (34%, $n$ = 29) in the study had total household incomes of less than $5,000, followed closely by 27% ($n$ = 23) who reported total household incomes of $5,000 to $9,999 (see Table 2).  In 2015, the U.S. federal government considers a one person household to be at poverty level when they earn $11,770 annual income, and $15,930 for a household of two (DHHS, Office of The Assistant Secretary for Planning and Evaluation , 2015).  Therefore, seventy-three percent ($n$ = 63) of the participants reported their total household income was below 14,999 dollars annually, indicating that 73% were below U.S. federal government poverty guidelines for a household of two.

Table 2.  Demographics of Sample of Pregnant Women at Pregnancy Resource Centers.

| Characteristic | *n* | % |
|---|---|---|
| **Race** | | |
| White | 71 | 83 |
| Black | 7 | 8 |
| Asian | 1 | 1 |
| Other | 7 | 8 |
| **Hispanic, Latino, or Spanish origin** | | |
| Not of Hispanic, Latino, or Spanish origin | 71 | 83 |
| Mexican, Mexican American, Chicano | 1 | 1 |
| Puerto Rican | 7 | 8 |
| Other Hispanic, Latino, or Spanish origin | 7 | 8 |
| **Total household income last year, from all sources** | | |
| Less than $5,000 | 29 | 34 |
| $5,000-9,999 | 23 | 27 |
| $10,000-14,999 | 11 | 13 |
| $15,000-19,999 | 5 | 6 |
| $20,000-29,999 | 5 | 6 |
| $30,000-39,999 | 7 | 8 |
| $40,000-80,000 | 5 | 7 |
| **Highest Degree Earned** | | |
| No degree | 16 | 19 |
| High School | 45 | 52 |
| GED | 11 | 13 |
| Trade School | 6 | 7 |
| Associate's Degree | 2 | 2 |
| Bachelor's Degree | 5 | 6 |
| Master's Degree | 1 | 1 |
| **Total No. of Pregnancies** | | |
| 1 | 25 | 29 |
| 2 | 22 | 25 |
| 3 | 17 | 20 |
| 4 | 10 | 12 |
| 5-10 | 12 | 14 |

Note:  N= 86

However, many of the participants (58%, *n* = 50) had living children ranging from one to six children, which would increase the number of individuals in the household, and therefore, include more households within the poverty level raising the poverty level to 79% (*n* = 68) in this sample of pregnant women.

In addition, 65% (*n* = 56) of women in the study reported the highest grade they completed in school was 12$^{th}$ grade or that they completed the GED, while 19% (*n* = 16) of participants did not complete high school.  Some women did attend college (38%, *n* = 33), including 16% (*n* = 14) who graduated with some type of college degree (Associate's Degree [*n* = 2], Bachelor's Degree [*n*= 5], Master's Degree [*n* = 1]) or certification [*n* = 6] (see Table 2).

The women in the study reported they had been pregnant from 11 to 39 weeks. At the time of survey completion, pregnant women in the study had known they were pregnant at least eight weeks, with a range of having known they were pregnant 8 weeks to 37 weeks at the time of the survey.  It is interesting that 38% (*n* = 33) said they wanted to be pregnant now or sooner, indicating an intended pregnancy.  Unintended pregnancies were defined in this study as those that were mistimed [wanted to be pregnant later] (20%, *n* = 17) or unwanted [did not want to be pregnant now or in the future] (5%, *n* = 4), pregnancies that were not initially wanted, but now the woman was glad she was pregnant (30%, *n* = 26) and those who reported they were unsure of how they felt about the pregnancy (7%, *n* = 6).  Therefore, 62% (*n* = 53) of the pregnancies were considered unintended for this study.  This is higher than the reported 51% of unintended pregnancies in the United States (Finer & Zolna, 2014).  However, this is very similar to Finer and Zolna's (2014) reported statistics for unintended pregnancies in women with

incomes less than 100% and 100% to 199% of federal poverty levels (65% and 55% of pregnancies unintended respectively). In addition, it is not unexpected that the number of pregnant women who reported unintended pregnancies at Pregnancy Resource Centers could be higher.

An overwhelming majority of the women in this study considered themselves to be Christian (76%, $n = 65$); however, 16% ($n = 14$) of women reported no religion. Seven women (8%) represented other religions including Muslim ($n = 1$), Buddhist ($n = 1$), Spirituality ($n = 1$), Jehovah's Witness ($n = 1$), Unsure ($n = 1$), and two who did not indicate what *other* religion. Using the Duke University Religion Index, twenty-seven percent (27%, $n = 23$) of pregnant women reported they attended church or other religious meetings once a week or more (organized religiosity), and 28%, ($n = 24$) reported spending time in private religious activities such as prayer daily or more than once a day (non-organized religiosity). A high level of intrinsic religiosity was reported by 55% ($n = 47$) of pregnant women in the study. Using the Religious Surrender and Attendance Satisfaction Scale, 40% ($n = 34$) reported high religious commitment, while 60% ($n = 52$) reported low religious commitment. However, 55% ($n = 47$) reported they were satisfied with their attendance at religious services and 52% ($n = 45$) were satisfied with their level of surrender to God (see Table 3).

Pregnant women who visited the Pregnancy Resource Centers were varied as to whether or not they received services at the centers and which services they received. Only 10% ($n = 9$) of pregnant women received no services at the Pregnancy Resource Centers. The largest percentage of services received were participation in classes such as parenting, healthy relationships, and life skills classes (65%, $n = 56$), followed closely by

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Table 3.  Descriptive Statistics for Religiosity Variables.

| Characteristic | n | % |
|---|---|---|
| Religious affiliation | | |
| Christian Protestant | 30 | 35 |
| Christian Catholic | 12 | 14 |
| Christian Other | 23 | 27 |
| Other Religion | 7 | 8 |
| No religion | 14 | 16 |
| Duke University Religion Index | | |
| DUREL Subscale 1 – Organized Religiosity | | |
| How often do you attend church or other religious meetings? | | |
| Less than 1 time per week | 63 | 73 |
| Once a week or more | 23 | 27 |
| DUREL Subscale 2 – Non-organized Religiosity | | |
| How often do you spend time in private religious activities? | | |
| Less than daily | 62 | 72 |
| Daily or more than once a day | 24 | 28 |
| DUREL Subscale 3 - Intrinsic Religiosity | | |
| Definitely or tends *not* true of me, unsure | 39 | 45 |
| Definitely or tends to be true | 47 | 55 |
| Religious Surrender and Attendance Satisfaction Scale | | |
| High religious commitment | 34 | 40 |
| Low religious commitment | 52 | 60 |
| Satisfied with Surrender to God | 45 | 52 |
| Not satisfied with Surrender to God | 41 | 48 |
| Satisfied with Religious Attendance | 47 | 55 |
| Not satisfied with Religious Attendance | 39 | 45 |

Note:  N= 86

those who received support services such as *Earn While You Learn* (Heritage House '76,

2014), or counseling (57%,  $n = 49$).  Medical services such as pregnancy tests or

ultrasounds were reported by 30% ($n = 34$) as services they received at the centers.

Lastly, bible studies or any biblically-based parenting class were reported least often as a

service received at the Pregnancy Resource Centers (10%, $n = 9$). The numbers of times that pregnant women participated in the services was varied from one or two times up to more than eleven reported services received in any one area. However, many of the participants used words to describe the number of services they had received such as "weekly", "once a month", and "a lot" which made analysis of this variable less clear. Explanation of the categorization of this variable is found in Appendix G.

## Analysis of Specific Aims

### Specific Aim # 1

The first aim of this research study was to describe the health-promoting behaviors of pregnant women who visit Pregnancy Resource Centers. The HPLP II overall scores ranged from 1.77 to 3.90 ($M= 2.73$, $SD = .45$), indicating "sometimes" or "often" the pregnant women report engaging in health-promoting behaviors. The
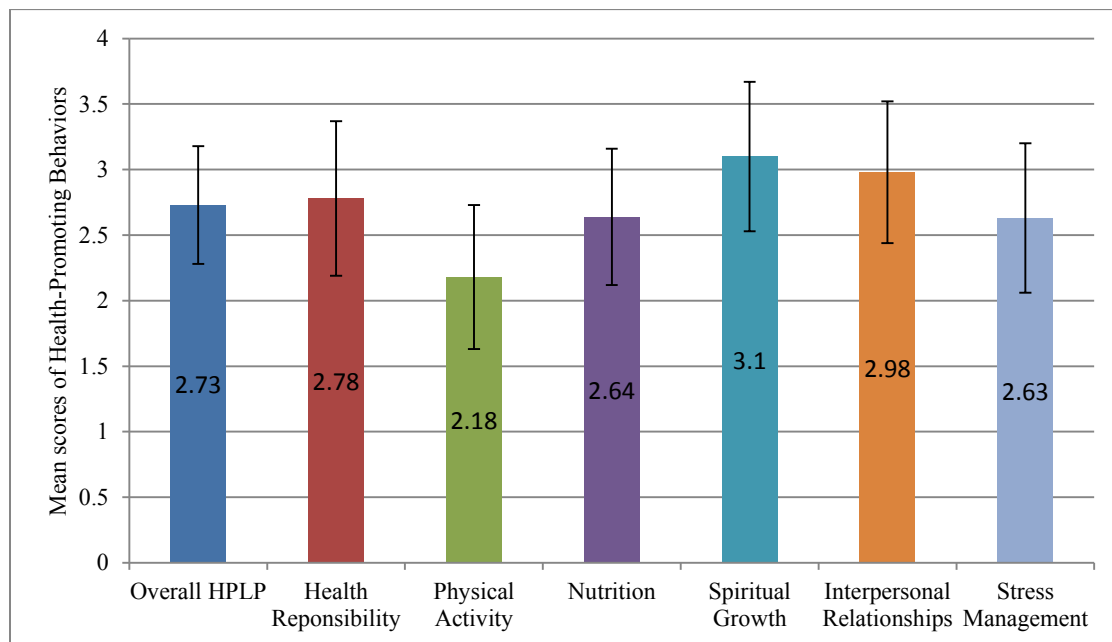


Figure 5. Bar graph showing mean health-promoting behavior scores of pregnant women at Pregnancy Resource Centers. Error bars are included to show the standard deviations of each mean score.

subscale with the highest mean was the spiritual growth subscale ($M$= 3.10, $SD$ = .57) while physical activity was the lowest with a mean of 2.18 ($SD$ = .55). Comparisons of all of the mean scores of the HPLP II and subscales of the HPLP II for the pregnant women at Pregnancy Resource Centers are reported in Figure 5.

The responses on the HPLP II spirituality subscale with the highest means are reported in Table 4. The question of how frequently the pregnant women "Look forward to the future" had the highest mean score in the spirituality subscale ($M$ = 3.45, $SD$ = .70), with 81% ($n$ = 76) indicating they often or routinely "Look forward to the future". Eighty percent (80%, $n$ = 69) of the pregnant women reported they often or routinely "feel I am growing and changing in positive ways" and "believe that my life has purpose". In addition, there was no significant difference between the scores on the spiritual growth subscale and whether someone intended to be pregnant verses someone who did not intend to be pregnant ($U$ = 678, $z$ = -1.75, $p$ = .080).

Table 4. Highest Mean Scores in Spiritual Growth Subscale

|  | Mean | *SD* |
|---|---|---|
| Spiritual Growth Subscale |  |  |
| Look forward to the future | 3.45 | .70 |
| Believe that my life has purpose | 3.30 | .81 |
| Feel I am growing and changing in positive ways | 3.21 | .75 |

Note: N= 86

Moreover, since physical activity was the lowest score on the HPLP II, responses

with lowest mean scores are reported in Table 5. The lowest mean score in the physical

activity subscale reported by the pregnant women in this study was in response to the

statement how frequently do I "Check my pulse rate when exercising" ($M = 1.69$, $SD =$

.90). It is interesting that 36% ($n = 31$) reported they routinely "Get exercise during usual

daily activities (such as walking during lunch, using stairs instead of elevators, parking

the car away from destination and walking)", with an overall mean reported by all the

pregnant women of 3.03 ($SD = .86$), indicating they often exercise in their usual daily

activities. However, 41% of the women ($n = 35$) reported they *never* followed a planned

exercise program.

Table 5. Lowest Mean Scores in Physical Activity Subscale.

|  | Mean | SD |
| --- | --- | --- |
| Physical Activity Subscale |  |  |
| Check my pulse rate when exercising | 1.69 | .90 |
| Reach my target heart rate when exercising | 1.87 | .97 |
| Follow a planned exercise program | 1.85 | .89 |

Note: N= 86

**Specific Aim # 2**

The second specific aim was to explore the relationship between each of the

following sets of variables (religiosity, demographics, pregnancy-related variables, or

services obtained at the Pregnancy Resource Center) and health-promoting behaviors of

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pregnant women at Pregnancy Resource Centers.  Each set of variables was analyzed

with both the overall HPLP II score and HPLP II subscores.  Independent variables with

statistically significant relationships with the HPLP II overall scores are presented below.

**Demographic variables.**  The relationships between each of the independent

variables and health-promoting behaviors of pregnant women at the Pregnancy Resource

Centers were explored using Independent *t*-tests for dichotomous variables and ANOVA

for categorical variables with three or more categories (see Table 6).  Evaluation of the

demographic variables revealed only Hispanic ethnicity had a statistically significant

relationship with health-promoting behaviors as measured by the HPLP II.  When all of

the categories for Hispanic ethnicity were included in the analysis, there were no

significant differences between the groups ($F$ (3, 82) = 1.44, $p$ = .237).  However, when

the variable asking about Hispanic ethnicity was dichotomized into Hispanic/Not

Hispanic a significant difference in mean scores on the HPLP II was noted.  Women who

reported they were Hispanic had lower HPLP II scores ($M$ = 2.53, $SD$ = .40) compared to

women who were not Hispanic ($M$ = 2.78, $SD$ = .45), $t$ (84) = 2.13, $p$ = .036.

**Pregnancy-Related variables.**  In the pregnancy-related variables, a pregnant

woman's report of her pregnancy intention was related to her health-promoting behaviors

as reported on the HPLP II.  While the relationship between pregnancy intention

categories and HPLP II scores was not statistically significant (F (5, 80) = 1.20, $p$ = .315),

when the variable was categorized into unintended and intended pregnancies, women

with intended pregnancies had higher scores on the HPLP II ($M$ = 2.81, $SD$ = .50) than

women with unintended pregnancies ($M$ = 2.69, $SD$ = .42, $t$ (84) = -.1.20, $p$ = .233), but

this remained not statistically significant.  Lastly, although only six women reported they

Table 6.  Relationships Between Sets of Variables and Health-Promoting Behaviors.

| Independent Variables | Univariate Analysis with Overall HPLP II | |
|---|---|---|
| | $t$-test | ANOVA |
| Demographics | | |
| Age | $t\,(84)= .677$ | |
| Race | | $F\,(3, 82) = 1.17$ |
| Hispanic/Not Hispanic | $t\,(84)= 2.13*$ | |
| Marital status | | $F\,(4, 81) = 1.21$ |
| Total Income | | $F\,(8, 77) = .46$ |
| Highest Grade | $t\,(84)= 1.80†$ | |
| Degree Earned | | $F\,(6, 79) = .17$ |
| | | |
| Pregnancy- Related | | |
| # of Pregnancies | $t\,(84)= 1.39†$ | |
| # Live Children | $t\,(84) = -.75$ | |
| Weeks Pregnant | $t\,(84) = -1.21†$ | |
| Weeks Known Pregnant | $t\,(84) = -.74$ | |
| Pregnancy Intention | | $F\,(5, 80) = 1.20$ |
| Unintended/Intended | $t\,(84) = -.1.20†$ | |
| Unsure/Other Intentions | $t\,(84) = 2.32*$ | |
| | | |
| Services obtained | | |
| Medical | $t\,(84) = .39$ | |
| Bible Study | $t\,(84) = -.75$ | |
| Classes | $t\,(84) = -2.14*$ | |
| Support Service | $t\,(84) = -.94$ | |
| No Services | $t\,(84) = .22$ | |
| # Medical | | $F\,(2, 83) = .586$ |
| # Bible Study | | $F\,(3, 82) =2.36†$ |
| # Classes | | $F\,(3, 82) = .803$ |
| # Support Service | | $F\,(3, 82) = .156$ |
| | | |
| Religiosity | | |
| DUREL 1 | $t\,(84) = 1.49†$ | |
| DUREL 2 | $t\,(84) = 1.98†$ | |
| DUREL 3 | $t\,(84) = 2.03*$ | |
| RSASS | | |
|   Religious Commitment | $t\,(84) = 2.10*$ | |
|   Satisfaction with Surrender to God | $t\,(84) = 2.51*$ | |
|   Satisfaction with Religious Attend. | $t\,(84) = .51$ | |
| Religious Affiliation | | $F\,(4, 81) = .842$ |

Note.  Variables with relationships with HPLP II with $p < .25$ were included in the
Multiple Linear Regression, except # Bible study, and Unsure/Other intentions
 $* p < .05$   $† p < .25$

were unsure about their pregnancies, the mean score on the HPLP II for those women (*M* = 2.33, *SD* = .37) was significantly lower than for all other categories of pregnancy intention (*M* = 2.76, *SD*= .44), *t* (84) = 2.32, *p* = .023).  While this is an interesting finding, because there is a greater than 90-10 split on this dichotomous variable, no further data analysis was conducted on women who were unsure of their pregnancy intention.

It is interesting that 30% (*n* = 26) reported "I did not want to be pregnant, but now I'm glad I am".  Although these pregnant women who changed their mind about wanting a child are almost half of the unintended pregnancies (*n* = 53 of unintended pregnancies), there was no statistical difference between the health-promoting behaviors of these pregnant women and the other women who reported unintended pregnancies ["I wanted to be pregnant later", "I did not want to be pregnant now or at any time in the future", and "I am unsure how I feel"] (*t* (51) = -.54, *p* = .595).

**Services obtained at the Pregnancy Resource Centers.**  Overall, only one relationship was noted between pregnant women who obtained services at the Pregnancy Resource Center and women who didn't have services at the Pregnancy Resource Centers.  Women who reported attending classes at the Pregnancy Resource Centers had higher scores on the HPLP II (*M* = 2.81, *SD* = .47) than women who did not attend classes (*M* = 2.59, *SD*= .39), t (84) = -2.14, *p* = .035.  While the accuracy of the number of times pregnant women received services at the Pregnancy Resource Centers was limited due to the vague responses by some women, as discussed previously, no statistically significant relationship was noted between health-promoting practices of

pregnant women and the number of times they received services at the Pregnancy Resource Centers.

      **Religiosity.** The relationship between religiosity and health-promoting behaviors in pregnant women at Pregnancy Resource Centers was explored with two religiosity instruments measuring organized religiosity, non-organized religiosity and intrinsic religiosity with the DUREL; and measuring religious commitment and satisfaction with religious commitment with the RSASS, including satisfaction with religious services attendance and satisfaction with surrender to God. In addition, pregnant women were asked to identify their religious affiliation. Organized religiosity, non-organized religiosity, satisfaction with religious attendance and religious affiliation were not significantly associated with health-promoting behaviors.

      Pregnant women who reported higher intrinsic religiosity had higher scores on the HPLP II, ($M$ = 2.82, $SD$ = .45), indicating more health-promoting behaviors, compared to those with lower intrinsic religiosity ($M$ = 2.62, $SD$ = .44), t (84) = 2.03, $p$ = .046. In addition, pregnant women with high levels of religious commitment reported higher scores on the HPLP II ($M$ = 2.86, $SD$ = .49) than women with lower levels of religious commitment ($M$ = 2.65, $SD$ = .41), $t$ (84) = -2.10, $p$ = .039. Women who were satisfied with their level of surrender to God also reported higher scores on the HPLP II ($M$ = 2.86, $SD$ = .46), than women who were not satisfied with their level of surrender to God ($M$ = 2.62, $SD$ = .42), $t$ (84) = 2.51, $p$ = .014. However, pregnant women who reported they were satisfied with their attendance at religious services were not statistically significant difference on their HPLP II scores than women who were not satisfied with their attendance at religious services ($t$ (84) = .51, $p$ = .609.

**HPLP II subscales.** In order to more fully explain the health-promoting behaviors of the pregnant women at Pregnancy Resource Centers, each subscale within the HPLP II was correlated with the sets of independent variables. Means or medians are reported depending on whether the test was a parametric or non-parametric test (see Chapter 3 Data Analysis Description). The results of these analyses are presented below.

*Health Responsibility subscale.* In the Health Responsibility subscale of HPLP II, the six pregnant women who reported they were unsure about their pregnancy intention had a significantly lower mean score on the subscale ($M = 2.13$, $SD = .44$), than women who reported any of the other responses for pregnancy intention ($M = 2.83$, $SD = .57$), $t(84) = 2.91$, $p = .005$. Pregnant women who reported being satisfied with their surrender to God also had significantly higher scores of the Health Responsibility subscale ($M = 2.93$, $SD = .59$), than those who were not satisfied with their surrender to God ($M = 2.64$, $SD = .56$), $t(84) = 2.29$, $p = .024$. There was no statistically significant difference between women who reported they were satisfied with their attendance at religious services and those who reported they were not satisfied ($t(84) = 1.02$, $p = .310$).

*Physical Activity subscale.* Several variables were significantly related to the Physical Activity subscale of the HPLP II. Pregnant women who reported they were Hispanic had significantly lower scores on the Physical Activity subscale ($Md = 1.88$), than those who were not Hispanic ($Md = 2.25$), $U = 331$, $z = -2.78$, $p = .005$. Pregnant women who had no children or one child had significantly higher scores on the Physical Activity subscale ($Md = 2.25$), than those who had two or more children ($Md = 1.88$), $U = 554$, $z = -2.13$, $p = .033$, Pregnant women who reported being satisfied with their surrender to God also had significantly higher scores on the Physical Activity subscale

($Md = 2.25$), than those who were not satisfied with their surrender to God ($Md = 2.0$), $U$ = 657.5, $z = -2.30$, $p = .022$

*Nutrition subscale.* The Nutrition subscale of the HPLP II was significantly related to at least one variable in the demographics, pregnancy-related variables, services obtained at the Pregnancy Resource Center, and religiosity variables (see Table 7).

Table 7. Relationships Between Nutrition Subscale Score of HPLP II and Variables.

| Variable group | Nutrition Subscale | | |
| --- | --- | --- | --- |
| | Mean (SD) | $t$-test | $p$ |
| Highest Grade | | | |
| 12th grade of higher | 2.94 (.55) | | |
| Less than 12th grade | 2.60 (.51) | $t(84) = 2.00$ | $p = .049$ |
| Pregnancy Intention | | | |
| All of pregnancy intention | 2.67 (.52) | | |
| Unsure | 2.17 (.38) | $t(84) = 2.34$ | $p = .022$ |
| Classes at Pregnancy Resource Center | | | |
| Yes | 2.74 (.55) | | |
| No | 2.45 (.42) | $t(84) = -2.53$ | $p = .013$ |
| DUREL subscale 1 | | | |
| High Organized Religiosity | 2.86 (.56) | | |
| Low Organized Religiosity | 2.56 (.49) | $t(84) = 2.38$ | $p = .019$ |
| RSASS | | | |
| Religious Commitment (RC) | | | |
| High RC | 2.78 (.46) | | |
| Low RC | 2.54 (.59) | $t(84) = 2.07$ | $p = .041$ |
| Satisfaction with Surrender to God | | | |
| Yes | 2.77 (.50) | | |
| No | 2.52 (.52) | $t(84) = 2.27$ | $p = .026$ |

*Note.* N = 86

In addition, more frequent attendance in organized religion (DUREL subscale1), high religious commitment, and satisfaction with surrender to God (RSASS) were associated with higher scores on the Nutrition subscale. Although pregnant women who reported they were satisfied with their surrender to God had higher mean scores on the Nutrition subscale than women who were not satisfied with their surrender to God, no statistically significant difference was noted in the Nutrition subscale scores in pregnant women who were satisfied with their religious services attendance compared to women who were not satisfied.

*Spiritual Growth subscale.* The Spiritual Growth subscale of the HPLP II was significantly associated with all of the religiosity variables and religious affiliation (see Table 8). In addition, the total number of pregnancies a woman had was also significantly associated with the Spiritual Growth subscale. Pregnant women who reported having three or more pregnancies had a significantly higher score on the Spiritual Growth subscale ($Md = 3.33$), than women who reported one or two pregnancies ($Md = 2.89$), $U = 650.5$, $z = -2.31$, $p = .021$.

*Interpersonal Relations subscale.* The Interpersonal Relations subscale of the HPLP II was significantly related to race, Hispanic ethnicity, and if a pregnant woman reported being unsure about her pregnancy. Pregnant women who reported they were Hispanic had a significantly lower scores on the Interpersonal Relations subscale ($Md = 2.56$), than women who reported they were not Hispanic ($Md = 3.11$), $U = 402.5$, $z = -2.0$, $p = .046$.

Table 8.  Relationships between Spirituality Subscale Score of HPLP II and Religiosity Variables.

| Variable group | Spirituality Subscale | Mann-Whitney U |
|---|---|---|
| **DUREL** | | |
| DUREL subscale 1 | | |
| High Organized Religiosity | Md = 3.44 | *U = 490.5, z = - 2.29** |
| Low Organized Religiosity | Md  = 2.90 | |
| DUREL subscale 2 | | |
| High Nonorganized Religiosity | Md = 3.44 | *U = 449.5, z = - 2.84** |
| Low Nonorganized Religiosity | Md = 2.90 | |
| DUREL subscale 3 | | |
| High Intrinsic Religiosity | Md = 3.33 | *U = 609.5, z = - 2.68*** |
| Low Intrinsic Religiosity | Md = 2.78 | |
| **RSASS** | | |
| Religious Commitment (RC) | | |
| High RC | Md = 3.44 | *U = 536.0, z = - 3.08*** |
| Low RC | Md = 2.89 | |
| Satisfaction with Surrender to God | | |
| Yes | Md = 3.44 | *U = 696.5, z = - 1.96** |
| No | Md = 2.89 | |
| Satisfaction with Religious Attendance | | |
| Yes | Md = 3.11 | *U = 875.0, z = - .36* |
| No | Md = 3.11 | |

*Note.* N = 86
* *p* < .05   ** *p* < .01

In addition, pregnant women who reported they were unsure how they felt about their pregnancy also had significantly lower scores on the Interpersonal Relations subscale (*Md* = 2.50) than woman who reported any other pregnancy intention (*Md* = 3.00), *U* = 120.5, *z* = - 2.03, *p*= .042.

***Stress Management subscale.*** Lastly, only two religiosity variables were significantly associated with the Stress Management subscale of the HPLP II. Pregnant women who reported high religious commitment had a higher score on the Stress Management subscale (*Md* = 2.75) than women who reported lower religious commitment (*Md* = 2.50), $U = 630$, $z = -2.25$, $p = .024$. In addition, women who reported high intrinsic religiosity had higher scores on the Stress Management subscale (*Md* = 2.75, *n* = 86) than women who had lower scores on intrinsic religiosity (*Md* = 2.38, *n* = 86), $U = 641$, $z = -2.39$, $p = .016$.

**Specific Aim # 3**

The third specific aim was to determine the percentage of variance that religiosity explains in health-promoting behaviors, above and beyond what the other variables explain, in pregnant women at Pregnancy Resource Centers. Blocked stepped multiple linear regressions were conducted to determine the percentage of variance that religiosity explains in health-promoting behaviors, beyond what the other variables explain, in pregnant women at Pregnancy Resource Centers. Independent variables that were related to health-promoting behaviors in pregnant women during bivariate correlations with at least a $p < 0.25$ were included in the multiple linear regression. However, two variables were excluded from the analysis (# of bible studies attended, and the dichotomized pregnancy intention variable when one category was "unsure" and the other pregnancy intention categories were "other"). Although they had correlations with health-promoting behaviors less than $p < 0.25$, the categories in these two variables were a split of 90-10 or less, which could skew the analysis of the data (Tabachnick & Fidel, 2013).

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Blocked stepwise multiple linear regressions were conducted with the following dichotomized independent variables ($p < 0.25$) entered into block one: classes attended at the Pregnancy Resource Centers (yes/no), Hispanic ethnicity (yes/no), highest grade achieved ($12^{th}$ grade or higher verses less than $12^{th}$ grade), pregnancy intention (unintended verses intended pregnancy), total number of pregnancies (less than three verses three or more), and number of weeks pregnant [11-26 weeks verses 27-39 weeks] (see Appendix H). DUREL subscales one, two, and three, and the RSASS scores including religious commitment and satisfaction with surrender to God were entered into block two using stepwise analysis. In addition, separate blocked stepwise multiple linear regressions were conducted for each religiosity variable, with block one independent variables entered first using stepwise analysis, and then each religiosity variable entered separately into their own multiple linear regression in block two. Of the blocked stepwise multiple linear regression models with single religiosity variables in block two, only models with DUREL subscales one, two, and three, and satisfaction with surrender to God (RSASS) were reported in this dissertation, as the religious commitment (RSASS) multiple linear regression model did not explain any additional variance in health-promoting behaviors beyond what the other variables explained.

**Multiple linear regression with all religiosity variables.** The results of the full blocked stepwise multiple linear regression with all of the religiosity variables entered into block two was a statistically significant model (see Table 9). In block one, two steps were obtained through the stepwise method, indicating that 10% of the variance in health-promoting behaviors were explained by whether the pregnant women attended classes at the Pregnancy Resource Center or were of Hispanic ethnicity. However, when religiosity

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Table 9.  Multiple Linear Regression With all Religiosity Variables.

| Independent Variables | $B$ | SE | β | $t$ | $p$ |
|---|---|---|---|---|---|
| **Block 1** | | | | | |
| <u>Step 1</u> | | | | | |
| Constant | 2.59 | .08 | | 32.08 | .000 |
| Attending Classes | .21 | .10 | .23 | 2.14 | .035* |
| | | | | | |
| <u>Step 2</u> | | | | | |
| Constant | 2.65 | .08 | | 31.54 | .000 |
| Attending Classes | .20 | .10 | .21 | 2.04 | .044* |
| Hispanic Ethnicity | - .24 | .12 | - .21 | -2.04 | .045* |
| | | | | | |
| **Block 2** | | | | | |
| <u>Step 3</u> | | | | | |
| Constant | 2.55 | .10 | | 27.51 | .000 |
| Attending Classes | .19 | .10 | .20 | 1.96 | .053 |
| Hispanic Ethnicity | - .21 | .12 | - .19 | - 1.80 | .075 |
| RSASS | | | | | |
|    Satisfaction with Surrender to God | .21 | .10 | .23 | 2.22 | .029* |
| | | | | | |
| <u>Step 4</u> | | | | | |
| Constant | 2.49 | .10 | | 26.40 | .000 |
| Attending Classes | .18 | .10 | .19 | 1.95 | .055 |
| Hispanic Ethnicity | - .23 | .11 | - .20 | - 2.03 | .045* |
| RSASS | | | | | |
|    Satisfaction with Surrender to God | .22 | .09 | .25 | 2.44 | .017* |
| DUREL Subscale 2 | .24 | .10 | .24 | 2.43 | .017* |

Note:
Step 1:  $R^2 = .05$; Adjusted $R^2 = .04$; $R^2$ change = .05 ($F$ (1, 84) = 4.58, $p$ = .035
Step 2:  $R^2 = .10$; Adjusted $R^2 = .08$; $R^2$ change = .05 ($F$ (1, 83) = 4.14, $p$ = .045
Step 3:  $R^2 = .15$; Adjusted $R^2 = .12$; $R^2$ change = .05 ($F$ (1, 82) = 4.93, $p$ = .029
Step 4:  $R^2 = .21$; Adjusted $R^2 = .17$; $R^2$ change = .06 ($F$ (1, 81) = 5.89, $p$ = .017
$p < .05$

variables were entered into block two with stepwise analysis, though the overall model

was significant, classes obtained at the Pregnancy Resource Center was no longer a

significant predictor of health-promoting behaviors. Religiosity (DUREL subscale 2 and

RSASS satisfaction with surrender to God) were significantly associated with health-

promoting behaviors and accounted for an additional 11% of the variance in health-

promoting behaviors thereby explaining a total of 21% of the variance in health-

promoting behaviors in pregnant women at Pregnancy Resource Centers (see Table 9).

**Multiple linear regressions with individual religiosity variables.** The blocked

stepwise multiple linear regressions with individual religiosity variables resulted in four

statistically significant models with organized religiosity, non-organized religiosity,

intrinsic religiosity, and satisfaction with surrender to God explaining additional variance

in health-promoting behavior scores above and beyond what the other variables

explained. Religious Commitment and satisfaction with religious service attendance did

not explain any variance in the scores of the HPLP II above what was explained by

whether or not pregnant women attended classes at the Pregnancy Resource Centers or

were of Hispanic ethnicity.

*Organized religiosity.* Organized religiosity (DUREL subscale 1) (see Table 10)

accounted for an additional 4% of the variance above and beyond the variance explained

by whether or not pregnant women attended classes at the Pregnancy Resource Centers or

were of Hispanic ethnicity. Together the model accounted for 14% of the variance in

health-promoting behaviors in pregnant women at Pregnancy Resource Centers ($R^2$ = .14;

$R^2$ change = .04 ($F$ (1, 82) = 4.186, $p$ = .044). Organized religiosity made a unique

contribution to the explanation of the variance of health-promoting behaviors in

pregnancy women with a β = .21.

Table 10. Multiple Linear Regression with Organized Religiosity Variable.

| Independent Variables | B | SE | β | t | p |
|---|---|---|---|---|---|
| Block 1 | | | | | |
| Step 1 | | | | | |
| Constant | 2.59 | .08 | | 32.08 | .000 |
| Attending Classes | .21 | .10 | .23 | 2.14 | .035* |
| | | | | | |
| Step 2 | | | | | |
| Constant | 2.65 | .08 | | 31.54 | .000 |
| Attending Classes | .20 | .10 | .21 | 2.04 | .044* |
| Hispanic Ethnicity | - .24 | .12 | .21 | - 2.04 | .045* |
| | | | | | |
| Block 2 | | | | | |
| Step 3 | | | | | |
| Constant | 2.59 | .09 | | 29.87 | .000 |
| Attending Classes | .21 | .10 | .22 | 2.17 | .033* |
| Hispanic Ethnicity | - .28 | .12 | .25 | - 2.87 | .020* |
| DUREL Subscale 1 | .22 | .11 | .21 | 2.05 | .044* |

Note:  Organized religiosity is measured by DUREL subscale 1
Step 1:  $R^2$ = .05; Adjusted $R^2$ = .04; $R^2$ change = .05 ($F$ (1, 84) = 4.58, $p$ = .035
Step 2:  $R^2$ = .10; Adjusted $R^2$ = .08; $R^2$ change = .05 ($F$ (1, 83) = 4.14, $p$ = .045
Step 3:  $R^2$ = .14; Adjusted $R^2$ = .11; $R^2$ change = .04 ($F$ (1, 82) = 4.186, $p$ = .044
*$p$ < .05

*Non-Organized religiosity.*  Non-organized religiosity (DUREL subscale 2) [see

Table 11] accounted for an additional 5% of the variance above and beyond what was

explained by whether or not pregnant women attended classes at the Pregnancy Resource

Centers or were of Hispanic ethnicity.  Together the model accounted for 15% of the

variance in health-promoting behaviors in pregnant women at Pregnancy Resource

Centers ($R^2$ = .15; $R^2$ change = .05 ($F$ (1, 82) = 4.85, $p$ = .030).  Non-organized religiosity

made a unique contribution to the explanation of the variance of health-promoting

behaviors in pregnancy women with a $\beta$ = .23.

Table 11.  Multiple Linear Regression with Non-Organized Religiosity Variable

| Independent Variables | $B$ | SE | $\beta$ | $t$ | $P$ |
|---|---|---|---|---|---|
| **Block 1** | | | | | |
| **Step 1** | | | | | |
| Constant | 2.59 | .08 | | 32.08 | .000 |
| Attending Classes | .21 | .10 | .23 | 2.14 | .035* |
| | | | | | |
| **Step 2** | | | | | |
| Constant | 2.65 | .08 | | 31.54 | .000 |
| Attending Classes | .20 | .10 | .21 | 2.04 | .044* |
| Hispanic Ethnicity | - .24 | .12 | - .21 | - 2.04 | .045* |
| | | | | | |
| **Block 2** | | | | | |
| **Step 3** | | | | | |
| Constant | 2.59 | .09 | | 30.21 | .000 |
| Attending Classes | .20 | .10 | .21 | 2.03 | .045* |
| Hispanic Ethnicity | - .26 | .12 | -.23 | - 2.26 | .027* |
| DUREL Subscale 2 | .23 | .10 | .23 | 2.20 | .030* |

Note:  Non-organized religiosity is measured by DUREL subscale 2
Step 1:  $R^2$ = .05; Adjusted $R^2$ = .04; $R^2$ change = .05 ($F$ (1, 84) = 4.58, $p$ = .035
Step 2:  $R^2$ = .10; Adjusted $R^2$ = .08; $R^2$ change = .05 ($F$ (1, 83) = 4.14, $p$ = .045
Step 3:  $R^2$ = .15; Adjusted $R^2$ = .12; $R^2$ change = .05 ($F$ (1, 82) = 4.85, $p$ = .030
*$p$ < .05

*Intrinsic religiosity.* Intrinsic religiosity (DUREL subscale 3) [see Table 12] accounted

for an additional 4% of the variance in health-promoting behaviors above and beyond the

variance explained by whether or not pregnant women attended classes at the Pregnancy

Resource Centers or were of Hispanic ethnicity. Together the model accounted for 14%

of the variance in health-promoting behaviors in pregnant women at Pregnancy Resource

Centers ($R^2$ = .14; $R^2$ change = .04 (F (1, 82) = 4.14, p = .045). Intrinsic religiosity made

Table 12. Multiple Linear Regression with Intrinsic Religiosity Variable.

| Independent Variables | *B* | SE | β | *t* | *p* |
|---|---|---|---|---|---|
| **Block 1** | | | | | |
| Step 1 | | | | | |
| Constant | 2.59 | .08 | | 32.08 | .000 |
| Attending Classes | .21 | .10 | .23 | 2.14 | .035* |
| | | | | | |
| Step 2 | | | | | |
| Constant | 2.65 | .08 | | 31.54 | .000 |
| Attending Classes | .20 | .10 | .21 | 2.04 | .044* |
| Hispanic Ethnicity | - .24 | .12 | - .21 | - 2.04 | .045* |
| | | | | | |
| Block 2 | | | | | |
| Step 3 | | | | | |
| Constant | 2.55 | .10 | | 26.46 | .000 |
| Attending Classes | .20 | .10 | .21 | 2.04 | .044* |
| Hispanic Ethnicity | - .24 | .12 | - .21 | - 2.04 | .044* |
| DUREL Subscale 3 | .19 | .10 | .21 | 2.04 | .045* |

Note: Intrinsic religiosity is measured by DUREL subscale 3
Step 1: $R^2$ = .05; Adjusted $R^2$ = .04; $R^2$ change = .05 (F (1, 84) = 4.58, p = .035
Step 2: $R^2$ = .10; Adjusted $R^2$ = .08; $R^2$ change = .05 (F (1, 83) = 4.14, p = .045
Step 3: $R^2$ = .14; Adjusted $R^2$ = .11; $R^2$ change = .04 (F (1, 82) = 4.14, p = .045
*p < .05

a unique contribution to the explanation of the variance of health-promoting behaviors in pregnancy women with a $\beta = .21$.

***Satisfaction with surrender to God.*** Lastly, Satisfaction with surrender to God (RSASS) [see Table 13] accounted for an additional 5% of the variance above and beyond the variance explained by whether or not pregnant women attended classes at the Pregnancy Resource Centers or were of Hispanic ethnicity. Together the model accounted for 15% of the variance in health-promoting behaviors in pregnant women at Pregnancy Resource Centers [$R^2 = .15$; $R^2$ change = .05 ($F(1, 82) = 4.93$, $p = .029$] (see Table 13). Satisfaction with surrender to God made a unique contribution to the explanation of the variance of health-promoting behaviors in pregnancy women with a $\beta = .23$.

However, after the addition of the satisfaction with surrender to God variable to the model, Hispanic ethnicity and having attended classes at the Pregnancy Resource Centers were no longer significant predictors of health-promoting behaviors, suggesting that their relationships with health promotion were confounding relationships rather than an actual relationship with health promoting behaviors. In order to determine whether there was an interaction effect between satisfaction with surrender to God and Hispanic ethnicity, another multiple linear regression was conducted entering the interaction between satisfaction with surrender to God and Hispanic ethnicity into the model. The interaction effect was calculated by multiplying the satisfaction with surrender to God variable and the Hispanic ethnicity variable to create the interaction variable. No statistically significant interaction was found between satisfaction with surrender to God

and Hispanic ethnicity behaviors ($t = 2.11$, $p = .779$) further assuring that satisfaction with surrender to God confounds the relationship between Hispanic ethnicity, classes, and health-promoting behavior.

Table 13.  Multiple Linear Regression Satisfaction With Surrender to God.

| Independent Variables | B | SE | β | t | p |
|---|---|---|---|---|---|
| **Block 1** | | | | | |
| Step 1 | | | | | |
| Constant | 2.59 | .08 | | 32.08 | .000 |
| Attending Classes | .21 | .10 | .23 | 2.14 | .035* |
| | | | | | |
| Step 2 | | | | | |
| Constant | 2.65 | .08 | | 31.54 | .000 |
| Attending Classes | .20 | .10 | .21 | 2.04 | .044* |
| Hispanic Ethnicity | - .24 | .12 | - .21 | - 2.04 | .045* |
| | | | | | |
| **Block 2** | | | | | |
| Step 3 | | | | | |
| Constant | 2.55 | .09 | | 27.51 | .000 |
| Attending Classes | .19 | .10 | .20 | 1.96 | .053 |
| Hispanic Ethnicity | - .21 | .12 | - .19 | - 1.80 | .075 |
| RSASS | | | | | |
|    Satisfaction with Surrender to God | .21 | .09 | .23 | 2.22 | .029* |

Note:  Satisfaction with Religious Commitment is measured in RSASS
Step 1:  $R^2 = .05$; Adjusted $R^2 = .04$; $R^2$ change = .05 ($F$ (1, 84) = 4.58, $p = .035$
Step 2:  $R^2 = .10$; Adjusted $R^2 = .08$; $R^2$ change = .05 ($F$ (1, 83) = 4.14, $p = .045$
Step 3:  $R^2 = .15$; Adjusted $R^2 = .12$; $R^2$ change = .05 ($F$ (1, 82) = 4.93, $p = .029$
*$p < .05$

**Summary**

Pregnant women who visited Pregnancy Resource Centers reported they "sometimes" or "often" engaged in health-promoting behaviors, however health-promoting behaviors overall were not a "routine" part of their lives ($M = 2.73$, $SD = .45$). When comparing specific variables to health-promoting behaviors in pregnant women, several factors were found to be related to the frequency of health-promoting behaviors in pregnant women at Pregnancy Resource Centers. Hispanic ethnicity, having had classes at the Pregnancy Resource Centers, higher scores in intrinsic religiosity, religious commitment, and satisfaction with surrender to God did have significant relationships to the frequency of health-promoting behaviors in pregnant women at the Pregnancy Resource centers. However, in multivariate analysis, higher reported levels of organized religiosity, non-organized religiosity, intrinsic religiosity, and higher satisfaction with the surrender to God explained additional variance in the women's report of frequency of health-promoting behaviors above and beyond what was explained by Hispanic ethnicity or having attended classes at the Pregnancy Resource Centers. The results of this dissertation study indicated that religiosity was related to health-promoting behaviors in pregnant women at Pregnancy Resource Centers.

**CHAPTER V**

**DISCUSSION**

**Introduction**

This chapter presents a discussion of the results of the statistical analysis

described in chapter four.  Following a brief summary of the overall study, a discussion

of the results of the research is presented informed by previous literature and utilizing

Pender's Health Promotion Model as the theoretical framework (Pender et al., 2002,

2011). Several areas of discussion include: overall discussion of the health-promoting

behaviors of the pregnant women at these Pregnancy Resource Centers; discussion of the

analysis of relationships with health-promoting behaviors; and discussion of variables

with significant relationships with health-promoting behaviors. The Health Promotion

Model is discussed specific to the results of this dissertation study. The implications of

this research for the nursing profession including the significance to nursing research,

nursing theory, and nursing practice are explained.

**Summary of the Research Study**

**Purpose and Aims of the Study**

Although religiosity has been noted to be related to the health of individuals for

many years (Koenig et al., 2012), and specifically has been associated with some positive

health behaviors in pregnant women (Burdette et al., 2012; Gillum & Sullins, 2008; Jesse

& Reed, 2004; Mann et al., 2007; Page et al., 2009), whether religiosity was related to

health-promoting behaviors in pregnant women at Pregnancy Resource Centers had not been previously studied. The purpose of this research study was to explore the relationship between religiosity and health-promoting behaviors of pregnant women at Pregnancy Resource Centers. Pregnancy Resource Centers are Christian community-based centers with the primary focus of meeting needs (physical, social, educational, and spiritual) of women who are pregnant, particularly those women who report having unintended pregnancies. The specific aims of this descriptive correlational study were to:

1. Describe the health-promoting behaviors of pregnant women at Pregnancy Resource Centers.

2. Explore the relationship between each of the following sets of variables (religiosity, demographics, pregnancy-related variables, or services obtained at the Pregnancy Resource Center) and health-promoting behaviors of pregnant women at Pregnancy Resource Centers.

3. Determine the percentage of variance that religiosity explains in the health-promoting behaviors, above and beyond what the other variables explain, in pregnant women at Pregnancy Resource Centers.

Recognizing that pregnant women who visit Pregnancy Resource Centers may be experiencing an unintended pregnancy amplifies the importance of identifying factors related to health-promoting behaviors since unintended pregnancies have been associated with low birth weight and preterm births for some women (Flower et al., 2013; Mohllajee et al., 2007; Orr et al., 2000; Shah et al., 2011).

**Methods of Study**

A descriptive correlational study was conducted to examine the relationship between religiosity and health-promoting behaviors in pregnant women at Pregnancy Resource Centers. Consecutive sampling continued for forty and one-half weeks at eleven different sites of Pregnancy Resource Centers in eastern Pennsylvania. Pregnant women who visited the Pregnancy Resource Centers and met the inclusion criteria (18 years of age or older who had known they were pregnant for at least two months and were able to read and write English) were asked to complete a survey including questions about their demographic characteristics, religiosity, and health-promoting behaviors during pregnancy.

**Health Promotion Model**

Pender's Health Promotion Model (Pender et al., 2002, 2011) was used as a theoretical framework for this dissertation study to investigate health-promoting behaviors in pregnant women at Pregnancy Resource Centers. Proposition one, "prior behavior and inherited and acquired characteristics influence beliefs, affect, and enactment of health-promoting behavior" and proposition eight, "persons are more likely to commit to and engage in health-promoting behaviors when significant others model the behavior, expect the behavior to occur, and provide assistance and support to enable the behavior" (Pender et al., 2002, p. 64) were the two propositions upon which this research was based. The Health-Promoting Lifestyle Profile II (HPLP II) was used to gather data about the health-promoting behaviors of the pregnant women in this study. The HPLP II is a 52-item self-report questionnaire with six subscales of health-promoting behaviors including health responsibility, interpersonal relations, spiritual growth,

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physical activity, nutrition, and stress management.  The HPLP II is scored on a 4-point

Likert scale with 1= never, 2 = sometimes, 3 = often, and 4 = routinely.

## Health-Promoting Behaviors of Pregnant Women at
## Pregnancy Resource Centers

Overall, pregnant women who visited Pregnancy Resource Centers in this study

reported they "sometimes" or "often" engaged in health-promoting behaviors based on

the mean score of 2.73 on the HPLP II ($M$ = 2.73, $SD$ = .45).  This was slightly higher

than the health-promoting behaviors of a sample of pregnant women from Midwestern

United States with complicated pregnancies reported by Stark and Brinkley (2007)

[$M$ = 2.61, $SD$ = .39] and higher than a study conducted with pregnant women of

Mexican American ethnicity [$M$ = 2.49] (Mendelson et al., 2008).  The overall HPLP II

score for the pregnant women at Pregnancy Resource Centers in eastern Pennsylvania

was also higher than reported scores from pregnant women in Turkey [$M$ = 2.43]

(Gokyildiz et al., 2013) but lower than the reported scores from pregnant women in

Thailand [$M$ = 3.01] (Thaewpia et al., 2013).

Pregnant women at Pregnancy Resource Centers in eastern Pennsylvania reported

the highest health-promoting behaviors in the area of spiritual growth ($M$ = 3.10, $SD$ =

.57), followed by interpersonal relationships ($M$ = 2.98, $SD$ = .54), and health

responsibility ($M$ = 2.78, $SD$ = .59).  The lowest score in the HPLP II subscales was in

physical activity ($M$ = 2.18, $SD$ = .55).  These top three reported areas of health-

promoting behaviors were consistent with other research studies investigating health-

promoting behaviors in pregnant women (Gokyildiz et al., 2013; Stark & Brinkley, 2007;

Thaewpia et al., 2013) with spiritual growth having the highest mean, followed by

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interpersonal relationships, and then health responsibility.  Mendelson et al. (2008) had similar results in different rank order with interpersonal relationships having the highest mean in their study of pregnant women of Mexican American ethnicity.  Each of these studies (Gokyildiz et al., 2013; Mendelson et al., 2008; Stark & Brinkley, 2007; Thaewpia, et al., 2013) reported physical activity as the lowest area in health-promoting behaviors, consistent with the results obtained in this dissertation study.

Within the spiritual growth subscale, the highest mean score for the pregnant women in this dissertation study was in response to the question "Look forward to the future" [$M = 3.45$, $SD = .70$] (See Table 5), indicating the pregnant women reported they "often" or "routinely" looked forward to the future.  Although 62% ($n = 53$) of the women in this dissertation study reported their pregnancy was unintended, which might be assumed to be associated with concerns about the future, 88% ($n = 76$) reported they routinely or often looked forward to the future, and 80% ($n = 69$) reported they felt they were growing and changing in positive ways.  Furthermore, having an unintended pregnancy did not appear to be related to the pregnant woman's outlook on the future as no significant difference was noted in the scores on the spiritual growth subscale depending on whether a pregnancy was intended or not.

In a qualitative study by Jesse et al. (2007), low income African American and Caucasian pregnant women reported how spirituality affected their pregnancy.  One common theme was that spirituality provided guidance and support.  For example one pregnant woman said, "It helps keep me calm, lifts my spirit up, lets me know there is a brighter day" (Jesse et al., 2007, p. 154).  For pregnant women at these Pregnancy Resource Centers in eastern Pennsylvania, having a positive outlook about themselves

and the future may provide an influence on health-promoting behaviors regardless of the intention of their pregnancy.  However, the influence of spiritual growth on health-promoting behaviors could not be determined in this study as it was a descriptive correlational study and not meant to determine causation.

Although pregnant women at the Pregnancy Resource Centers reported the lowest scores for health-promoting behaviors in the  physical activity subscale, thirty-six percent ($n = 31$) of the pregnant women reported they routinely participated in exercise during usual daily activities such as walking during lunch, using the stairs instead of elevators, and parking the car away from a destination and walking.  However, 41% of the women ($n = 35$) reported they *never* followed a planned exercise program.  While light exercise during pregnancy is recommended, moderate-intensity aerobic activity is also recommended for most pregnant women according to the U.S. Department of Health and Human Services (2008).  In fact, a recent research study conducted in Spain investigated a moderate exercise program during pregnancy and determined there was no risk to maternal or pregnancy outcomes in women who followed the exercise plan (Barakat, Perales, Bacchi, Coteron, & Refoyo, 2014).  Encouraging pregnant women to seek advice from their healthcare providers and then begin planned exercise programs, could improve health-promoting behaviors in the physical activity subscale and the overall health-promoting behaviors of pregnant women during pregnancy, thereby improving health.

### Discussion of Analysis of Relationships to Health-Promoting Behaviors

The relationships between demographics, pregnancy-related variables, services obtained at the Pregnancy Resource Centers, religiosity variables, and health-promoting behaviors of pregnant women at Pregnancy Resource Centers were analyzed in this

dissertation research.  Both univariate and multivariate analyses were conducted and several variables were found to have significant relationships with health-promoting behaviors in this sample of pregnant women at Pregnancy Resource Centers.  Discussion of the results of the study will be presented below.

**Univariate Analyses**

When relationships between demographics, pregnancy-related variables, services obtained at the Pregnancy Resource Centers, religiosity variables, and health-promoting behaviors of pregnant women at Pregnancy Resource Centers were examined with univariate analyses, only six variables were statistically significantly related to health-promoting behaviors.  These variables included the following:  Hispanic ethnicity, if a pregnant woman was unsure of her pregnancy intention, whether the pregnant woman obtained classes at the Pregnancy Resource Centers, intrinsic religiosity, religious commitment, and satisfaction with surrender to God.  Each of these variables will be discussed in greater detail later in the discussion section.

All but one of the statistically significant variables in univariate analyses were included in multivariate analyses.  Being unsure of pregnancy intention was not included in the multivariate analyses.  While the unsure pregnancy intention variable was significantly related to health-promoting behaviors, the number of participants in the "unsure" category of the unintended pregnancy variable was less than 10% of the responses in the category, which could skew the analysis of the data (Tabachnick & Fidel, 2013).  Therefore, the dichotomized pregnancy intention variable, when one category was "unsure" and all other categories were labeled "other" was not included in the multivariate analysis.

**Multivariate Analyses**

In this sample of pregnant women who visited Pregnancy Resource Centers in eastern Pennsylvania, only Hispanic ethnicity and whether the women attended classes at the centers explained variance in health-promoting behaviors before adding religiosity into the statistical models. In each model, Hispanic ethnicity and classes attended at the Pregnancy Resource Centers explained 10% of the variance in health-promoting behaviors (see Figure 6). No other demographic, pregnancy-related variable, or service obtained at the Pregnancy Resource Centers explained any variance in the health-promoting behaviors of these women.

**Multiple linear regression and demographics.** Hispanic ethnicity was the only demographic variable that was a statistically significantly predictive in multivariate analysis. In studies conducted in the United States that reported correlations of demographics with health-promoting behavior scores; educational level (Bond et al., 2002), ethnicity (Esperat et al., 2007), and income (Stark & Brinkley, 2007) were reported to have significant associations with health-promoting behavior in pregnant women. It is interesting to note, that in Esperat et al.'s study, variables that were entered into the multiple linear regression but were not significant included: age, number of pregnancies, marital status, employment, and high school education. Esperat et al.'s findings are similar to the results of this study, in that in Esperat's study ethnicity was the only variable that explained variance in health-promoting behaviors of pregnant women and in this study Hispanic ethnicity was the only demographic variable to explain variance in health-promoting behavior.

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In an older study conducted by Bond et al. (2002) which focused on pregnant women of Hispanic ethnicity, the variables that were not significantly related to health-promoting behaviors included age, education level, marital status, religious preference, and generation in the United States. Only higher educational levels were associated with more frequent health-promoting behaviors in the pregnant women of Hispanic ethnicity in Bond et al.'s study. However, it is important to note that 53% of the participants in Bond et al.'s (2002) study had not completed the eighth grade, whereas in this study, 65% of the pregnant women completed the 12th grade or a GED. It is possible that lower educational levels may be associated with less frequent health-promoting behaviors, though this result was not noted in this dissertation study as more of the pregnant women had completed at least the 12th grade or obtained a GED.

Stark and Brinkley (2007) reported there were no significant differences between health-promoting behaviors by race, marital status, parity, maternal employment, maternal age, or gestational age. It is important to note that only 5.8% of the participants in Stark and Brinkley's study were of Hispanic ethnicity. Stark and Brinkley (2007) reported that pregnant women with higher incomes did display more health-promoting behaviors. However, 46.4% of the pregnant women had income less than $30,000 in the Stark and Brinkley study, while 85% of the pregnant women in this study had incomes of less than $30,000. It is possible that since the income levels of the women in this dissertation study were lower than the Stark and Brinkley study, no variation was noted in the health-promoting behaviors of women with lower incomes because there were more similarities in income than there were differences. Therefore, the limited correlations with demographic variables in this dissertation study is consistent with other

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research with health-promoting behaviors in pregnant women in the United States and using the HPLP II (or HPLP) to measure health-promoting behaviors  (Bond et al., 2002; Esperat et al., 2007; Stark & Brinkley, 2007).

**Multiple linear regression with all religiosity variables.**  In the blocked stepwise multiple linear regression analysis, variables with $p < 0.25$ in univariate correlations with health-promoting behaviors were examined together in block one of the analysis (see Table 9).  Only two variables, Hispanic ethnicity and whether the women attended classes at the Pregnancy Resource Centers explained variance in the frequency of health-promoting behaviors.  In addition, after adding all of the religiosity variables into block two of the multiple linear regression model, only two religiosity variables explained additional variance in health-promoting behaviors after accounting for the variance explained by Hispanic ethnicity and pregnant women taking classes at the centers.  The two religiosity variables that significantly explained additional variance were non-organized religiosity and satisfaction with surrender to God.  Non-organized religiosity was not a significant predictor in the univariate comparisons with health-promoting behaviors but when considered with all of the other variables in multivariate analysis, became a significant contributor to the model.  In addition, while satisfaction with surrender to God was a significant contributor to the model, religious commitment was not.

Overall, the multiple linear regression model with all religiosity variables entered into the model accounted for a total of 21% of the variance in health-promoting behaviors in pregnant women at Pregnancy Resource Centers.  Based upon the $R^2$ change, satisfaction with surrender to God accounted for an additional 5% of the variance in the

health-promoting behaviors of pregnant women at Pregnancy Resource Centers, while

adding non-organized religiosity into the model accounted for an additional 6% of the

variance.  When entering all of the religiosity variables into the regression at one time, it

is possible that different religiosity variables may eliminate the effects of one another

since different types of religiosity may have opposite associations with one health-related

variable (Koenig & Bussing, 2010).  However, it *is* interesting that when the religiosity

variables were considered together the variance accounted for was greater than each

individual multiple linear regression model discussed below, indicating someone who has

higher levels of religiosity in more than one dimension may be more likely to exhibit

health-promoting behaviors than someone who has high levels of religiosity, but in fewer

dimensions.
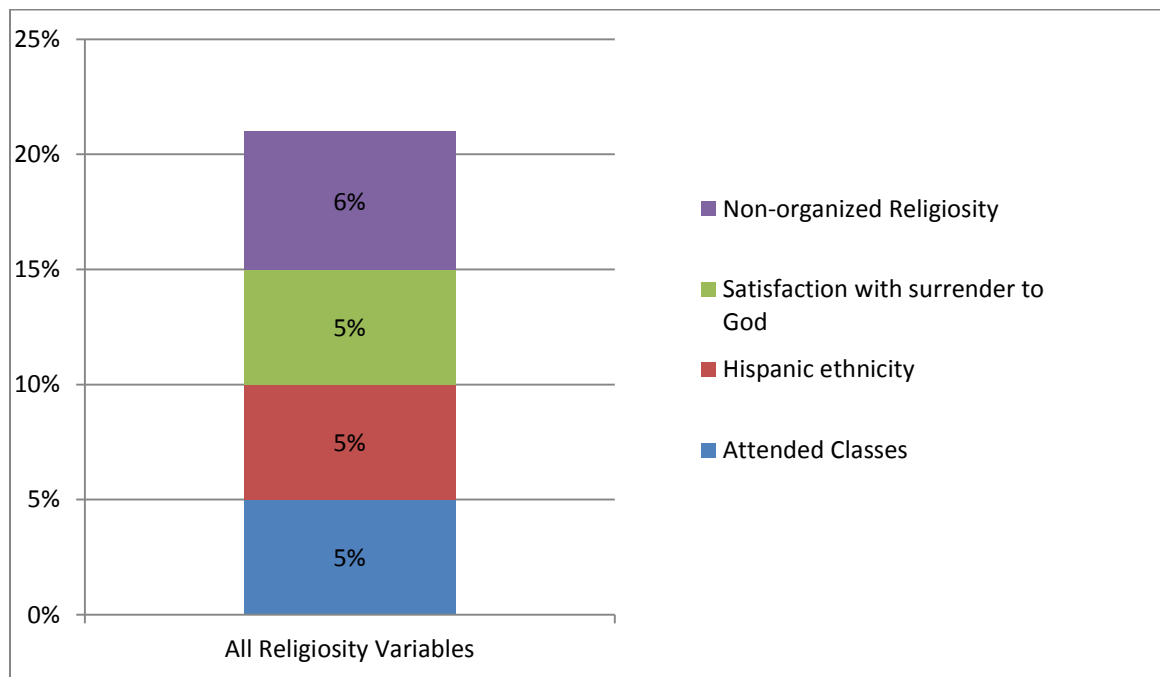


Figure 6.  Percentage of variance in health-promoting behaviors accounted for in model
with all religiosity variables entered.  These percentage scores are based upon the $R^2$
change at each step of the multiple linear regression model.

**Multiple linear regression with individual religiosity variables.** When only one religiosity variable was entered into block two of the statistical model at a time, Hispanic ethnicity and whether women attended classes at the centers continued to significantly explain 10% of the variance in the health-promoting behaviors of the pregnant women; however, four religiosity variables explained additional variance in health-promoting behaviors above the other variables in the models. Organized religiosity, non-organized religiosity, intrinsic religiosity, and satisfaction with surrender to God explained additional variance in health-promoting behaviors in their individual models (see Figure 7). Of interest is that neither organized nor non-organized religiosity had significant associations with health-promoting behaviors when analyzed in univariate
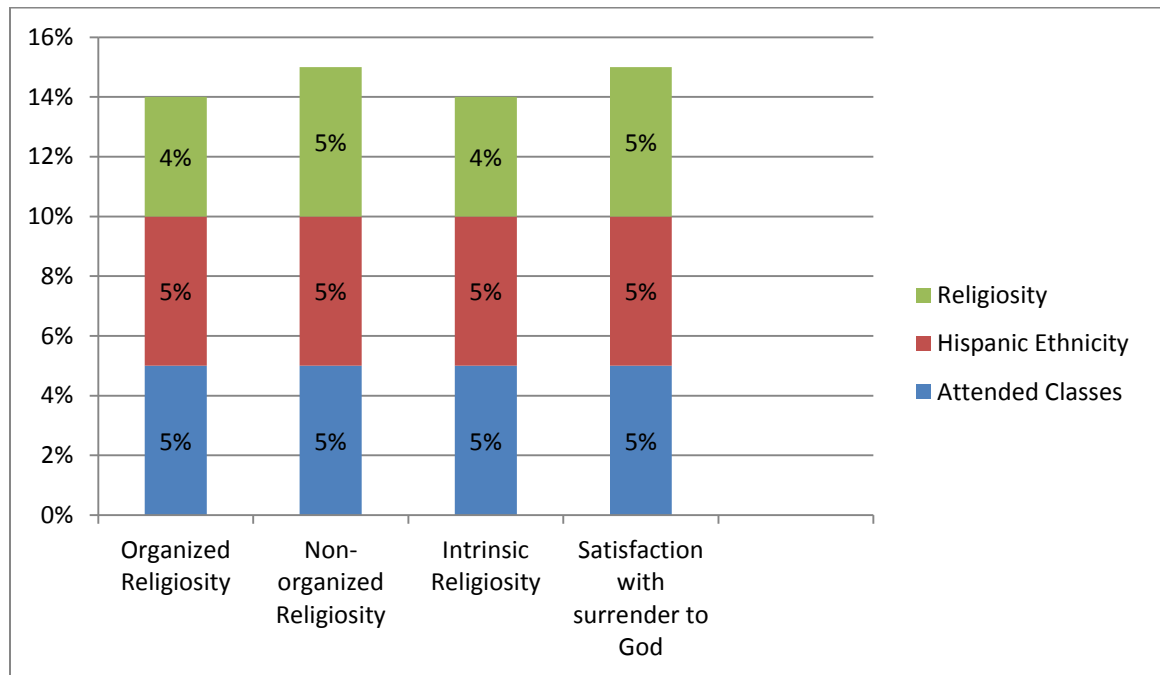


Figure 7. Comparison of percentages of variance in health-promoting behaviors accounted for in individual religiosity models. These percentage scores are based upon the $R^2$ change at each step of the multiple linear regression models.

analyses, yet explained additional variance in health-promoting behaviors when analyzed with other variables in multivariate analysis.

Based upon the $R^2$ change, each religiosity variable accounted for either 4% or 5% additional variance in their respective multiple linear regressions (Tables 10, 11, 12, and 13). Organized religiosity (having attended religious services at least weekly) and high level of intrinsic religiosity accounted for 4% of the additional variance in health-promoting behaviors of pregnant women at Pregnancy Resource Centers, while non-organized religiosity (praying or reading religious materials at least daily) and satisfaction with surrender to God accounted for an additional 5% of the variance. It is interesting to note that non-organized religiosity and satisfaction with surrender to God accounted for more variance in health-promoting behaviors in their individual models and also were the significant predictors in the multiple linear regression when all religiosity variables were entered at one time.

In the sections below, each variable that was significantly related to health-promoting behaviors in pregnant women at Pregnancy Resource Centers is discussed. Variables significantly related to health-promoting behaviors whether in univariate or multivariate statistics are discussed related to current literature in the area as well as how the variable specifically relates to Pender's Health Promotion Model (Pender et al., 2002, 2011).

### Discussion of Variables Relationships with Health-Promoting Behaviors

There were eight variables that were significantly related to health-promoting behaviors in this dissertation study. If pregnant women reported they were of

Hispanic ethnicity, were unsure of their pregnancy intention, or attended classes at the Pregnancy Resource Centers, there was a statistically significant relationship with health-promoting behaviors. Organized, non-organized, and intrinsic religiosities were positively related to health-promoting behaviors, as was religious commitment and satisfaction with surrender to God. Religious affiliation and satisfaction with religious attendance were not significant variables in this study. Each variable will be discussed below.

**Hispanic Ethnicity**

Hispanic ethnicity had a significant inverse relationship with health-promoting behaviors of pregnant women at Pregnancy Resource Centers. Women who reported they were of Hispanic ethnicity had lower HPLP II scores (indicating fewer health-promoting behaviors) compared to women who did not report Hispanic ethnicity. In addition, in multivariate linear regressions, Hispanic ethnicity was significant predictor of fewer health-promoting behaviors, except when satisfaction to surrender to God was entered into the multiple linear regression model (which will be discussed in the surrender to God section below).

In this dissertation research, English-speaking pregnant women who were of Hispanic ethnicity reported fewer health-promoting behaviors than women who were not of Hispanic ethnicity, which was similar to several studies noted in the literature. For example, Esperat et al. (2007) studied African American and Mexican American pregnant women and determined Mexican American pregnant women had significantly fewer health-promoting behaviors than African American pregnant women. Page (2007)

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reported that the level of acculturation of women of Hispanic ethnicity was significantly related to health behaviors during pregnancy, noting that women who were less acculturated (speaking only Spanish) had fewer health risk behaviors than more acculturated (English-speaking) Hispanic women.  Gollenberg, Pekow, Markenson, Tucker and Chasan-Taber (2008) reported similar findings indicating pregnant women who were bilingual or spoke only Spanish were less likely to smoke during pregnancy. Hispanic women in this study were only English-speaking and as such represent the more acculturated group of Hispanic women who speak English rather than Spanish. Therefore, the results of this study appear to be consistent with previous studies regarding health behaviors in pregnant women of Hispanic ethnicity.  Pregnant women who are of Hispanic ethnicity but English speaking (indicating more acculturation) are more likely to report health risk behaviors during pregnancy (Gollenberg et al., 2008; Page 2007), and as noted in this study,  have fewer health-promoting behaviors than non-Hispanic pregnant women.

Hispanic ethnicity is a personal factor of the individual characteristics and experiences category in the Revised Health Promotion Model (see Figure 1).  As an inherited characteristic, the mechanism for how Hispanic ethnicity influences "beliefs, affect, and enactment of health-promoting behavior" (Pender et al., 2002, p. 64) is unclear.  It is interesting to note that although some researchers have reported fewer health-promoting behaviors in women of Hispanic ethnicity (Esperat et al, 2007; Gollenberg et al., 2008; Page, 2007), this differs based upon acculturation (Bond et al., 2002; Page, 2007) and has not necessarily translated into poorer birth outcomes for infants of Hispanic mothers (Dalmida et al., 2010).  In fact, in 2010 infant mortality rates

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of Hispanic women were lower than the average infant mortality rate in the United States overall (Matthews & MacDorman, 2013).  This *Hispanic Paradox* has continued to be investigated by researchers seeking to clarify and further explore this phenomenon (Shaw & Pickett, 2013; Wakeel, Witt, Wisk, Lu, & Chao, 2014).  Overall, continued research to identify the factors influencing health-promoting behaviors in pregnant Hispanic women is recommended.

**Unintended Pregnancy**

Pregnancy intention is a personal factor in the individual characteristics and experiences category of the Revised Health Promotion Model (see Figure 1).  No statistically significant difference was noted in health-promoting behaviors of pregnant women when pregnancy intention was categorized as unintended verses intended pregnancies.  Pregnant women who reported "I did not want to be pregnant, but now I'm glad I am" accounted for nearly half of all unintended pregnancies.  Comparing pregnant women who reported "I did not want to be pregnant, but now I'm glad I am" to the other categories of unintended pregnancy did not reveal any statistically significant differences in health-promoting behaviors between the groups.

The only statistically significant finding was in six women who reported they were unsure about their pregnancies.  The mean score on the HPLP II for those women was significantly lower than for all other categories of pregnancy intention.  However, due to the small number of women reporting "unsure" of their pregnancy intention, these results must be interpreted with caution.  In addition this is contradictory to the research study conducted by Orr et al. (2008), who reported that women with unwanted

pregnancies were more likely to have negative heath behaviors during pregnancy than women who reported they were unsure of their pregnancy intention.

Unintended pregnancy is a personal factor in the Revised Health Promotion Model and an acquired characteristic of the pregnant women. In this study, pregnancy intention did not appear to influence the "beliefs, affect, and enactment of health-promoting behavior" (Pender et al., 2002, p. 64) and no significant association was noted between unintended pregnancy and the frequency of health-promoting behaviors. In previous studies, some researchers identified that unintended pregnancy was associated with unhealthy behaviors during pregnancy (Chisolm et al., 2014; Humbert et al., 2011, McCrory & McNaly, 2013). Other researchers reported that when they controlled for socioeconomic and familial variables, the association between unintended pregnancies and unhealthy behaviors was small or no longer significant (Gipson et al., 2008; Terplan et al., 2014). In addition, several researchers have reported fewer *healthy* behaviors in women with unintended pregnancies (Cheng et al., 2009; Dott et al., 2010); such as Humbert et al. (2011) who noted that women with unintended pregnancies were less likely to use WIC services than women with intended pregnancies. Since specific unhealthy behaviors were not investigated as part of this research study, it is not possible to know whether unhealthy behaviors would have been significantly associated with unintended pregnancy in this sample of pregnant women at Pregnancy Resource Centers. Therefore, research to further explore pregnancy intention is needed.

Two recent research studies, (Kost & Lindberg, 2015; Lindberg, Maddow-Zimet, Kost, & Lincoln, 2014) included a variable on the extent of the mistiming of pregnancy to investigate why research results related to pregnancy intention and maternal health

behaviors are inconsistent. After adjusting for demographic and socioeconomic characteristics through propensity score weighting, pregnancies that were unwanted were less likely to be recognized in the first 6 weeks, had later initiation of prenatal care (Kost & Lindberg, 2015; Lindberg et al., 2015), and lower birth weight babies (Kost & Lindberg, 2015) than intended pregnancies. In addition, pregnancies that were mistimed by more than 2 years were less likely to be recognized in the first 6-8 weeks (Kost & Lindberg, 2015; Lindberg et al., 2015), less likely to have early prenatal care, and were more likely to report exposure to smoke during pregnancy (Lindberg et al., 2015) than intended pregnancies. Lindberg et al. (2015) reported women with mistimed pregnancies less than two years did not have significant associations with negative healthy behaviors during pregnancy. These results indicate the need for measuring the extent of mistimed pregnancies when studying pregnancy intention.

While the mechanisms are unclear, no statistically significant difference was found between pregnant women who reported unintended pregnancies and pregnant women who reported intended pregnancies and the frequency of their health-promoting behaviors in this study. It is possible that measuring the extent of the mistimed pregnancies would have provided additional insight into the relationship between pregnancy intention and health-promoting behaviors in this dissertation study. In light of these new research study reports, further studies including the extent of mistimed pregnancies are warranted.

**Attending Classes**

There are many services offered at the Pregnancy Resource Centers including Medical Services (pregnancy test, ultrasound); Bible Study (or any biblically based

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parenting class); Classes (parenting, healthy relationships, life skills); and Supportive Services (*Earn While You Learn* [Heritage House '76, 2014], counseling). Although, 90% ($n = 78$) of pregnant women in this study received some type of service at the Pregnancy Resource Centers, the largest percentage of services reported by the pregnant women was participation in classes such as parenting, healthy relationships, and life skills classes. In univariate analysis, pregnant women who reported attending classes at the Pregnancy Resource Centers had significantly higher scores on the HPLP II than women who did not attend classes. In addition, in multivariate linear regressions, attending classes at the Pregnancy Resource Centers was a significant predictor of more frequent health-promoting behaviors in pregnant women, except when satisfaction to surrender to God was entered into the multiple linear regressions (which will be discussed in the surrender to God section below).

As mentioned, the classes at the Pregnancy Resource Centers are varied but include parenting, healthy relationships, and life skills classes (Family Research Council, 2012). Parenting classes can include prenatal classes focusing on changes within the pregnant women as well as nutritional information for pregnancy. Additional topics can include important information for after the baby is born including expected behaviors by ages. Although these classes are not specifically biblically based, the center volunteers are willing to provide faith-based support, such as praying for the pregnant woman if she requests prayer.

In a study by Mendelson et al. (2008) a parish nurse intervention program was studied to determine the effects of an educational program with faith-based support on gestational diabetes. Mendelson et al.'s experimental study randomized pregnant women

into two groups; the Care as Usual group (a standard education program in the State of California) or into the Parish Nurse Intervention Program (the standard approach and Parish Nurse Protocols including offering prayer and encouraging a spiritual connection appropriate to the pregnant woman's belief system). The results of Mendelson et al.'s (2008) study indicated pregnant women who attended the Parish Nurse Intervention Program had more health-promoting behaviors following the intervention than the women who had the Care as Usual approach. While the general content of the programs was similar, adding the faith-based component of prayer and making a spiritual connection appeared to provide an additional benefit to the pregnant women (Mendelson et al., 2008).

Although there was no explicitly Christian component to the parenting classes at the Pregnancy Resource Centers that the pregnant women reported attending in this dissertation study, it is possible that the volunteers did infuse religious content in such ways as offering to pray with the pregnant women and as such may have provided additional faith-based support to the women. Attending class at the Pregnancy Resource Centers was significantly related to more frequent health-promoting behaviors in pregnant women in this dissertation study. Whether this was influenced by the educational content or the environmental context was not able to be determined by this descriptive correlational study.

Services obtained at the Pregnancy Resource Centers are considered an interpersonal influence within the behavior-specific cognitions and affect category of the Revised Health Promotion Model (see Figure 1). Classes obtained at the Pregnancy Resource Centers are an interpersonal influence that may encourage the pregnant women

to engage in health-promoting behaviors because the center volunteers "model the behavior" or "expect the behavior to occur," as theorized by Pender et al. (2002, p. 64). According to Pender et al. (2011), interpersonal influences (such as classes at the Pregnancy Resource Centers in this study) are factors in the Health Promotion Model that may be able to be used as interventions to potentially modify the health-promoting behaviors of an individual. For example, a faith community nurse could offer a nutrition class at a Pregnancy Resource Center and through this intervention a pregnant woman may choose to change her nutritional habits, thereby increasing her health-promoting behaviors.

This is the first research study to investigate health-promoting behaviors in pregnant women at Pregnancy Resource Centers. It is therefore unknown whether similar results would be reported with other samples of pregnant women at Pregnancy Resource Centers in other locations. Since this study was not seeking understanding of causation, judgment cannot be made as to whether attending classes influenced health-promoting behaviors, rather only that a relationship exists. Further research is necessary to investigate the relationship between classes taken at the Pregnancy Resource Centers and health-promoting behaviors in pregnant women.

**Religiosity**

When seeking to understand the relationship between religiosity and health-promoting behaviors in pregnant women, several dimensions were studied. This dissertation study defined religiosity in five ways; as organized religiosity, non-organized religiosity, intrinsic religiosity, religious commitment, and religious affiliation. In

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addition, the pregnant women in this study were asked if they were satisfied with their religious commitment as part of the instrument on religious commitment.

**Religious affiliation.** Pregnant women at these Pregnancy Resource Centers in eastern Pennsylvania were primarily of Christian faith (76%, $n = 65$). However, 16% ($n = 14$) of the women reported they had no religious affiliation. In 2014, aggregate statistics reported for clients of over 1000 Pregnancy Resource Centers identified that 60% of the clients were Christian while 9.76% reported no religion (eKyros.com, 2014). This supports the belief that Pregnancy Resource Centers, though Christian-based, serve individuals of various religions and those who report no religion at all.

Since many of the pregnant women in this study wrote in "Christian" rather than identifying a particular denomination, the religious affiliation variable was re-categorized into Christian-Protestant, Christian–Catholic, Christian-other, other religion, and no religion. In this dissertation study, there was no significant relationship between religious affiliation and health-promoting behaviors of the pregnant women at the Pregnancy Resource Centers. However, other researchers have reported differences in health behaviors based upon religious affiliation (Baron et al., 2013; Mann et al., 2010; Najman et al, 1988; Page et al., 2009). For example, according to Baron et al. (2013) individuals who reported no religion were more likely to smoke than individuals who were Islamic, Christian Protestant or Christian Catholic religions.

Within the Revised Health Promotion Model (see Figure 1), religious affiliation is a personal factor in the individual characteristics and experiences category. Pender proposed that an acquired characteristic, such as religious affiliation, would influence someone's health-promoting behavior (Pender et al., 2002). However, a pregnant

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woman's religious affiliation did not appear to be related to the behavioral outcome of health-promoting behaviors in these pregnant women at Pregnancy Resource Centers in eastern Pennsylvania. It should be noted that a person could report a religious affiliation yet not actually participate in the religion. The next variable to be discussed specifically identified individuals that attend religious services.

**Organized religiosity.** High levels of organized religiosity (attending religious services once a week or more) was reported by only 27% ($n = 23$) of the pregnant women in this study. In multivariate analysis, a high level of organized religiosity did explain additional variance in health-promoting behaviors above and beyond what was explained by Hispanic ethnicity or having participated in classes at the Pregnancy Resource Centers. Although attendance at religious services once a week or more was a predictor of more frequent health-promoting behaviors, reporting Hispanic ethnicity and having obtained classes at the Pregnancy Resource Centers were stronger predictors of health-promoting behaviors than organized religiosity in the multiple linear regression model (see Table 10).

Organized religiosity (attendance at religious services) and health behaviors during pregnancy have been studied by several researchers (Burdette et al., 2012; Gillum & Sullins, 2008; Mann et al., 2007; Page et al., 2009). The results of this dissertation research were similar to the published literature. Previous research with pregnant women noted that, after adjusting for a variety of demographic and social variables, increased frequency of religious service attendance was associated with fewer unhealthy behaviors (Burdette et al., 2012; Gillum & Sullins, 2008; Mann et al., 2007; Page et al., 2009). Only Burdette et al. (2012) investigated whether frequency of religious attendance was

associated with better nutrition, a healthy behavior during pregnancy.  Burdette et al. noted increased frequency of attendance at religious services was associated with a greater likelihood of better maternal nutrition.

Organized religiosity is considered an interpersonal factor of the behavior-specific cognitions and affect category within the Revised Health–Promotion Model in this study (see Figure 1).  According to the Health-Promotion Model, interpersonal influences include the norms of significant others and can influence whether an individual will be more or less likely to engage in health-promoting behaviors (Pender et al., 2011). Researchers have pondered the reasons that individuals who attend religious services more frequently exhibit fewer unhealthy behaviors, such as illicit drug or alcohol use (Page et al, 2002).  It has been reported that individuals who attend religious services more frequently may more closely ascribe to the tenets of the faith, and therefore, would avoid behaviors that might be discouraged or even prohibited in the religion (Page et al., 2009).  In addition, participation in formal religious activity may also provide positive role models and reinforcement for expected behaviors (Page et al., 2009).  However, it could be argued that the influence of religious service attendance might be related to the underlying motivations for the attendance.  For instance, attendance at religious services could be motivated by guilt, or familial or cultural expectations that have little to do with an actual *desire* to be attending a religious service (Clements et al., 2013).  In such a case, a relationship between the behavior of attending a religious service and other behaviors in a person's life, such as health-promotion behaviors, may not truly be reflective of organized religiosity.

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In this dissertation study, it is unknown what motivated the pregnant women to attend religious services as well as what emphasis was placed on health-promoting behaviors at the religious services. However, attending religious services at least once a week explained additional variance in health-promoting behaviors above and beyond what was explained by Hispanic ethnicity and having attended classes at the Pregnancy Resource Centers. In addition, although not associated with health-promoting behaviors in univariate analysis, organized religiosity was a predictor of more frequent health-promoting behaviors of pregnant women at Pregnancy Resource Centers in multivariate analysis.

**Non-organized religiosity.** Although, non-organized religiosity was not significantly associated with more frequent health-promoting behaviors in univariate analysis, in multivariate analysis, increased frequency of non-organized religiosity did explain additional variance in health-promoting behaviors above and beyond what was explained by Hispanic ethnicity or having participated in classes at the Pregnancy Resource Centers. Increased frequency of non-organized religiosity (pregnant women who reported personal prayer or reading religious materials at least daily) was a significant predictor of health-promoting behaviors in these pregnant women at Pregnancy Resource Centers. In fact, non-organized religiosity was a stronger predictor of health-promoting behaviors than whether the pregnant woman attended classes at the Pregnancy Resource Centers (see Table 10).

While few research studies have investigated non-organized religiosity, the results of this dissertation research were similar to the limited published literature. In previous research, more frequent reports of prayer or personal bible reading (non-organized

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religiosity) were associated with reduced odds of tobacco use (Mann et al., 2007), and more frequent reports of social support (Dalmida et al, 2010). However one specific finding noted in the literature but not investigated in this research was that Mann et al. (2010) noted more frequent reports of prayer and bible reading were associated with higher negative stress experiences in English-speaking Hispanic women, but not Spanish-speaking Hispanic women. Further research into the relationships between Hispanic ethnicity and non-organized religiosity in pregnant women at Pregnancy Resource Centers may provide insight about additional factors associated with non-organized religiosity and health-promoting behaviors.

Non-organized religiosity is a personal factor of the individual characteristics and experiences category in the Revised Health Promotion Model (see Figure 1). Personal time spent in prayer or in reading religious materials can "influence beliefs, affect, and enactment of health-promoting behaviors" (Pender et al., 2002, p. 64). Many religions do emphasize the importance of individuals taking care of their physical bodies (I Corinthians 3:16, New International Version; Scheib, 2013; Stacey, 2008) and personal reading of religious materials may provide an influence on the person's health-promoting behaviors. Although this study was not intended to determine causation, the relationship between personal factors of religiosity, such as non-organized religiosity, and health-promoting behaviors in pregnant women at Pregnancy Resource Centers remains. Since little research has been conducted on this type of religiosity, continued research on non-organized religiosity in pregnant women would provide additional information into this relationship.

**Intrinsic religiosity.** Intrinsic religiosity seeks to identify whether a person's religious faith permeates all of their life, not so that a person gains some reward, but that the faith itself is the reward (Allport & Ross, 1967). While organized and non-organized religiosity could be identified through observing an individual, intrinsic religiosity is something that is deeply personal and requires a person to share personal feelings about religion in his or her life. The Duke University Religion Index asks women to respond to three statements to measure intrinsic religiosity [see Appendix B] (Koenig & Bussing, 2010; Koenig et al., 1997). One statement is "My religious beliefs are what really lie behind my whole approach to life." For those who have high intrinsic religiosity, following religious tenets is part of their lifestyle and as such, religions and religious organizations that promote good health may influence positive health-behaviors.

High intrinsic religiosity was reported by 55% ($n = 47$) of the pregnant women in this study. In addition, high intrinsic religiosity was significantly associated with more frequent reports of health-promoting behaviors. In the multiple linear regression model that included intrinsic religiosity, intrinsic religiosity explained variance in health-promoting behaviors of pregnant women at Pregnancy Resource Centers, above and beyond what was explained by Hispanic ethnicity and having attended classes at the Pregnancy Resource Centers. However, Hispanic ethnicity, attending classes at the Pregnancy Resource Centers, and intrinsic religiosity were equal predictors of health-promoting behaviors in the pregnant women at the Pregnancy Resource Centers, with high intrinsic religiosity related to more frequent reports of health-promoting behaviors.

Only one study was found investigating intrinsic religiosity and unhealthy behaviors in pregnant women. In the research conducted by Mann et al. (2007), intrinsic

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religiosity was not significantly related to recent tobacco use in pregnant women from three southern obstetrical practices, although organized and non-organized religiosity were significantly related to lower odds of recent tobacco use. Mann et al.'s report appears to conflict with the results of this dissertation study, which indicated higher intrinsic religiosity was associated with more frequent health-promoting behaviors in pregnant women at the Pregnancy Resource Centers. Unfortunately, Mann et al. (2007) did not indicate the number of women who reported high intrinsic religiosity in his research study, limiting the ability to compare and contrast the results of his research study to the results obtained in this dissertation research. Therefore, since the results of Mann et al.'s study on intrinsic religiosity appear to conflict with the results of this dissertation study, further studies with healthy behaviors during pregnancy and intrinsic religiosity are warranted.

Intrinsic religiosity is a personal factor of the individual characteristics and experiences category of the Revised Health Promotion Model (see Figure 1), and it does appear to have a relationship with health-promoting behaviors in this sample of pregnant women at Pregnancy Resource Centers. Few researchers have studied the relationship of intrinsic religiosity and health-promoting behaviors in pregnant women, in fact, only one study was found as reported above. It would seem that pregnant women who report high levels of intrinsic religiosity, indicating that their faith permeates all of their life, should also report more frequent health-promoting behaviors as noted in this dissertation study, since many religions encourage individuals to care for their physical bodies as discussed above. However, in the limited studies on intrinsic religiosity there is no consensus on whether intrinsic religiosity does have a positive relationship with health-promoting

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behaviors.  Continued research in this area would provide additional insight regarding relationship between intrinsic religiosity and health-promoting behaviors in pregnant women.

**Religious commitment.**  Religious commitment includes both surrender to God and attendance at religious services; thus identifying both internal feelings about religious commitment (surrender to God) as well as outward expressions of commitment through service attendance (Clements et al., 2013).  Pregnant women were asked to respond to two questions about surrender to God which included: "When my understanding of a problem conflicts with God's revelation (this means that God showed you something), I will submit to God's definitions"; and "Although I may not see results from my labor (this means work that you do.  It's not talking about birthing a baby), I will continue to implement God's plans as long as God directs me to do so" (see Appendix D).

In this dissertation study, 40% ($n = 34$) of the pregnant women reported high religious commitment.  Religious commitment was significantly associated with health-promoting behaviors in univariate analysis.  Pregnant women with high levels of religious commitment reported higher scores on the HPLP II (indicating more frequent health-promoting behaviors) than women with lower levels of religious commitment.  However, religious commitment was not a significant predictor of health-promoting behaviors in multivariate analysis.  Although no other research has been found investigating religious commitment and health-promoting behaviors in pregnant women, Clements et al. (2013) conducted a study investigating religious commitment (surrender to God) in pregnant women and levels of prenatal stress.  Clements et al. reported that women who were more surrendered to God had lower prenatal stress levels.

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**Satisfaction with religious commitment.** Satisfaction with religious commitment specifically asks respondents to indicate whether they are satisfied with their level of surrender to God and satisfied with their attendance at religious services (Cyphers & Clements, 2015). This religiosity measure provides the pregnant woman the opportunity to further clarify her feelings about her own religiosity by indicating her own satisfaction with her religious commitment (satisfaction with surrender to God and satisfaction with religious services attendance). In this study, women who were satisfied with their level of surrender to God reported more frequent health-promoting behaviors than women who were not satisfied with their level of surrender to God. However, a pregnant woman's satisfaction with attendance at religious services did not have a statistically significant relationship with health-promoting behaviors.

Satisfaction with religious commitment is a new construct that has been used in only one previous study (Cyphers & Clements, 2015). It is interesting to note that satisfaction with surrender to God did not mean that the pregnant woman necessarily had a high level of religious commitment. *Satisfaction* with surrender to God, regardless of level of religious commitment, did appear to have a significant relationship to health-promoting behaviors of pregnant women, although the mechanism of this action is unknown. It is interesting that satisfaction with religious service attendance was not significantly related to health-promoting behaviors, indicating that satisfaction *alone* was not the significant predictor of more frequent health-promoting behaviors but specifically *satisfaction with surrender to God*.

In multivariate analysis, when satisfaction with surrender to God was added with all other religiosity variables into block two of the blocked stepwise multiple linear

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regression, classes obtained at the Pregnancy Resource Center was no longer a significant predictor of health-promoting behaviors. In addition, when only satisfaction with surrender to God was entered into block two of the blocked stepwise multiple linear regression, Hispanic ethnicity and classes obtained at the Pregnancy Resource Center were no longer significant predictors health-promoting behaviors. Therefore, satisfaction with surrender to God confounded the relationship between health-promoting behaviors and Hispanic ethnicity and whether the women attended classes at the Pregnancy Resource Center, making satisfaction with surrender to God the only variable that explained variance in the health-promoting behaviors of the pregnant women.

Religious commitment and satisfaction with religious commitment (including satisfaction with surrender to God and satisfaction with religious service attendance) are personal factors in the individual characteristics and experiences category of the Revised Health Promotion Model (see Figure 1). Religious commitment includes surrender to God's ways (Wong-McDonald & Gorsuch, 2000) and according to Clements et al. (2013) may "identify individuals who trust God to be benevolent and powerful" (p. 98). Pregnant women who are more surrendered to God and who also attend religious services may represent women for whom the tenets of their faith are guiding principles in their lives, including perhaps the importance of taking care of their physical bodies, as evidenced by more frequent reports of health-promoting behaviors. However, while religious commitment was significantly related to health-promoting behaviors in pregnant women in univariate analysis, it did not explain additional variance in health-promoting behaviors in this sample of pregnant women at Pregnancy Resource Centers.

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As previously stated, when pregnant women were satisfied with their surrender to God there was a statistically significant relationship with more frequent health-promoting behaviors; and in fact, satisfaction with surrender to God confounded the relationship between health-promoting behaviors and Hispanic ethnicity and classes obtained at the Pregnancy Resource Centers. Satisfaction with surrender to God may represent a measure of peace with one's religion, which in itself may be associated with positive choices including choices related to healthy behaviors.

## Summary

Overall, several dimensions of religiosity did explain some of the variance in health-promoting behaviors in pregnant women at Pregnancy Resource Centers in this study, above and beyond whether the woman was of Hispanic ethnicity or attended classes at the Pregnancy Resource Centers. Specifically, pregnant women who attended religious services at least weekly; or who reported personal prayer or reading of religious materials at least daily, reported high intrinsic religiosity, or satisfaction with surrender to God also reported more frequent health-promoting behaviors, after accounting for other factors such as Hispanic ethnicity and classes attended at the Pregnancy Resource Centers. Each dimension of religiosity is different from the others and therefore, a person could exhibit more than one type of religiosity at one time. It is possible that the relationship between religiosity and health-promoting behaviors could be increased when an individual reports high levels of religiosity in more than one dimension of religiosity.

## Health-Promotion Model

The Health Promotion Model (Pender et al., 2002, 2011) provided the theoretical framework for this dissertation research. The Revised Health Promotion Model included

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individual characteristics and experiences; behavior specific cognitions and affect; and

the behavioral outcome of health-promoting behaviors. The personal factors within the

individual characteristics and experiences category included demographics, pregnancy-

related variables, and religiosity (see Figure 1). Of the personal factors within the

Revised Health Promotion Model studied in this dissertation, only Hispanic ethnicity and

religiosity were significantly related to health-promoting behaviors. The specific

religiosity variables within the personal factors that were significantly related to health-

promoting behaviors included non-organized religiosity, intrinsic religiosity, religious

commitment, and satisfaction with surrender to God.

The behavior specific cognitions and affect category of the Revised Health

Promotion Model included interpersonal influences, such as services obtained at the

Pregnancy Resource Centers and religiosity (see Figure 1). Interpersonal influences that

were significantly related to health-promoting behaviors included organized religiosity

and whether the pregnant women obtained classes at the Pregnancy Resource Centers.

While it is possible that interpersonal influences of religiosity might have occurred at the

Pregnancy Resource Centers through bible studies or biblically-based pregnancy classes,

only nine women reported participating in a bible study or any biblically-based parenting

class (10%, $n = 9$). Therefore, it may be that the religiosity reported by the pregnant

women in this study was not significantly influenced by the services received at the

Pregnancy Resource Centers (interpersonal influences); however this could not be

determined in this descriptive correlational dissertation study.

Proposition one, "prior behavior and inherited and acquired characteristics

influence beliefs, affect, and enactment of health-promoting behavior" (Pender et al.,

2002, p. 64), was supported through this research by identifying an association between Hispanic ethnicity, religiosity, and health-promoting behaviors in the pregnant women at the Pregnancy Resource Centers. Hispanic ethnicity had a negative relationship with health-promoting behaviors, while religiosity had a positive relationship with health-promoting behaviors. The relationship between classes obtained at the Pregnancy Resource Center and health-promoting behaviors, as well as the relationship between organized religiosity and health-promoting behaviors, supported proposition eight, "persons are more likely to commit to and engage in health-promoting behaviors when significant others model the behavior, expect the behavior to occur, and provide assistance and support to enable the behavior" (Pender et al., 2002, p. 64).

The assumption upon which the above propositions are made is that "Individuals in all their biopsychosocial complexity interact with the environment, progressively transforming the environment and being transformed over time" (Pender et al., 2002, p. 63). Pregnant women came to the Pregnancy Resource Centers for a variety of reasons. Some came only to receive free pregnancy tests, while other stayed for classes and other services offered at the centers. Recognizing that a person's individual characteristics and experiences (such as personal factors) as well as the behavior-specific cognitions and affect (such as interpersonal influences) interact in a transformative manner to influence the health-promoting behaviors of pregnant women, provides a framework for beginning to understand health-promoting behaviors in pregnant women at Pregnancy Resource Centers.

<center>**Recommendations**</center>

**Nursing Research**

      **Religiosity and health-promoting behaviors.**  While many researchers have investigated whether there is a relationship between religiosity and specific unhealthy behaviors during pregnancy (Burdette et al., 2012; Gillum & Sullins, 2008; Jesse & Reed, 2004; Mann et al., 2007; Page et al., 2009), very few have investigated the relationship between religiosity and healthy behaviors during pregnancy (Burdette et al., 2012), especially considering several dimensions of religiosity (Mann et al., 2007).  It was clear in this dissertation study that not all of the religiosity variables were significantly related to health-promoting behaviors.  In addition, the interaction between variables in multivariate analyses changed which specific religiosity variables explained health-promoting behaviors in the pregnant women.  Additional research to look at health-promoting behaviors including nutrition or physical activity, for example, and specifically studying various dimensions of religiosity could provide more information about the relationship between religiosity and health-promoting behaviors in pregnant women.

      **Satisfaction with surrender to God.**  Further research with the Religious Surrender and Attendance Satisfaction Scale (RSASS) instrument, including satisfaction with surrender to God and satisfaction with religious attendance as separate subscales of the satisfaction with religious commitment component of RSASS, could provide additional insight into the relationship between satisfaction with religious commitment and health-promoting behaviors.  Research to elucidate the relationships between satisfaction with surrender to God and other variables, such as inner peace, are needed to

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more fully understand how satisfaction with surrender to God may be related to health-promoting behaviors.  Continued research into the relationship among Hispanic ethnicity, classes obtained at the Pregnancy Resource Centers, and satisfaction with surrender to God would be beneficial to explore the confounding relationship among these variables. Lastly, research focusing on individuals who report they would like to be more religiously committed (they report they are not satisfied and want to be more religiously committed) may provide an opportunity to conduct a randomized clinical trial to determine if religious commitment can be increased through a faith-based intervention.

**Unintended pregnancy and Pregnancy Resource Centers.**  Consistent with reports from the Family Research Council (2009, 2012), there were a high percentage of pregnant women in this study who reported their pregnancies were unintended.  Although there was no statistically significant relationship between unintended pregnancy and health-promoting behaviors in this sample of pregnant women at Pregnancy Resource Centers in eastern Pennsylvania, unintended pregnancies remain a public health concern and continue to be a priority objective in Healthy People 2020 (DHHS, 2013b).

Previous researchers have had conflicting results as to whether unintended pregnancies are associated with maternal risk factors, such as unhealthy behaviors, once the statistical analysis is adjusted for demographic, socioeconomic, and family variables (Gipson et al., 2008; Terplan et al., 2014).  In this study, pregnancy intention was not related to health-promoting behaviors, in either bivariate or multivariate analysis. Although this is unusual, the health-promoting behaviors studied were all expected health behaviors and did not include information about any unhealthy behaviors the pregnant women may have been exhibiting.  Therefore, further research including unhealthy

pregnancy behaviors would enhance the understanding of how unintended pregnancy is related to health in pregnant women at Pregnancy Resource Centers.

Due to the conflicting reports regarding pregnancy intention and maternal health behaviors during pregnancy, recent research with unintended pregnancies recommended including the extent of the mistimed pregnancy as a variable for pregnancy intention research (Kost & Lindberg, 2015; Lindberg et al., 2015). Continued research investigating unintended pregnancies at Pregnancy Resource Centers should consider including the extent of mistimed pregnancies as a variable for pregnancy intention to further elucidate this phenomenon. Analyses should continue to include all categories of pregnancy intention separately, at least initially, to assure any variations in pregnancy intention are able to be identified in the analysis.

Particular areas of research at Pregnancy Resource Centers could include a variety of different topics. For instance, since having an unintended pregnancy did not have a negative relationship with the spiritual growth subscale of the HPLP II (including the pregnant woman's outlook on the future, her belief that her life had purpose, or how she felt about herself growing and changing in positive ways), research at Pregnancy Resource Centers could provide the opportunity to investigate whether there is a relationship between visiting Pregnancy Resource Centers and women's attitudes about an unintended pregnancy. Further research could be conducted to determine if services provided at Pregnancy Resource Centers are a mediating factor between unintended pregnancy and health-promoting behaviors of pregnant women at Pregnancy Resource Centers. In addition, research could be conducted with women who report unintended pregnancies who visit Pregnancy Resource Centers and those who do not visit Pregnancy

Resource Centers, to offer additional insight into the relationship between visiting

Pregnancy Resource Centers and health-promoting behaviors during pregnancy or if a

difference exists in the onset of prenatal care depending on whether they visit the centers.

Lastly, it is recommended that research with Pregnancy Resource Centers in the

future include a qualitative component to allow the participants to more fully express

their thoughts.  Several paper surveys were received with hand written notes that were

not entered into the database and were not included in this dissertation research.

Including this type of data in the future would provide a richer description of the

experiences of pregnant women at Pregnancy Resource Centers.

**Nursing Theory**

Pender's Health-Promotion Model is a multidimensional framework for exploring

a person's health-promoting behavior (Pender et al., 2011).  Individual characteristics and

experiences include personal factors that "influence beliefs, affect, and enactment of

health-promoting behavior" (Pender et al., 2002, p. 64).  Behavioral specific cognitions

and affect include interpersonal influences that may make a person "more likely to

commit to and engage in health-promoting behaviors" (Pender et al., 2002, p. 64).

Religiosity had not been formally studied within the Health Promotion Model previously.

As both a personal factor and an interpersonal influence, religiosity was found to have a

relationship with health-promoting behaviors in this dissertation study.  Further research

including religiosity as a component of Pender's Health-Promotion Model will provide

additional insight into the relationship between religiosity and health-promoting

behaviors.  In addition, further explication of the Health Promotion Model could include

religiosity as a factor under individual characteristics and experiences as well as under

behavioral specific cognitions and affect enhancing the holistic perspective of Pender's model.

**Nursing Practice**

Sixty-two percent of pregnant women (*n* = 56) in this dissertation study reported their pregnancy was unintended. Pregnancy Resource Centers offer a unique avenue to provide nursing care to women who report having an unintended pregnancy. Nurses may be able to partner with Pregnancy Resource Centers to assist with referrals to prenatal care as well as provide specific education to meet the needs of the pregnant women who visit the Pregnancy Resource Centers.

**Faith-Community nursing.** While nurses have a unique opportunity to care for pregnant women at Pregnancy Resource Centers, faith community nurses are also uniquely trained to provide faith-based support to the pregnant women (American Nurses Association & Health Ministries Association, 2012). Faith-community nurses can partner with Pregnancy Resource Centers to offer educational classes to help meet specific identified needs of the pregnant women in the community (Balint & George, 2015). Based upon the results of this study, it is recommended that Pregnancy Resource Centers and faith-community nurses consider offering classes that include information on following a planned exercise program.

In a recent study by Barakat et al. (2014), regular planned exercise improved blood pressures and was not associated with maternal or fetal risks in the pregnant women who participated in the study. In addition, Yamamoto, McCormick, and Burris (2013) reported only 17.9% of healthcare providers counsel pregnant women about diet and exercise during preventive healthcare visits. Since 62% (*n* = 56) of pregnant women

in this dissertation study attended some kind of classes at the centers, and attendance at classes was significantly related to health-promoting behaviors in pregnant women at Pregnancy Resource Centers, encouraging Pregnancy Resource Center staff to offer classes about physical activity during pregnancy could improve health-promoting behaviors in physical activity.

**Policy.**  Of the unintended pregnancies in the United States, 40% end in abortion [surgical or medical] (Finer & Zolna, 2014).  In the state of Pennsylvania in 2007, 55% of the unintended pregnancies ended in live birth, while 33% ended in abortion [type unspecified] (Finer & Kost, 2011).  The current national policies regarding unintended pregnancy focus on prevention of the unintended pregnancy through family planning and use of birth control (DHHS, 2013b).  However, as noted in this study, some pregnant women who report their pregnancy as unintended do change their minds about their feelings regarding the pregnancy.  In fact, 30% ($n = 26$) of the pregnant women in this study reported they initially did not want to be pregnant but now were glad they were.

Although prevention of unintended pregnancy is an important public health concern, additional emphasis on the care of women with unintended pregnancies may be a public health concern that has been overlooked.  While education and support services received through traditional obstetrical services (including hospital-based prenatal education and health care provider prenatal education, for example) provide an important role in improving maternal and fetal health outcomes, community-based support services may also provide an added measure of support for these vulnerable individuals.

Therefore, community-based support services for women with unintended pregnancies, including services provided at faith-based centers such as Pregnancy

Resource Centers, could be recognized as a part of overall health care services offered to pregnant women, especially those with unintended pregnancies. In some communities, organizations have begun to coordinate care and work cooperatively to provide more efficient and cost-effective care to these pregnant mothers. For example, during this research study, Planned Parenthood sent several women to a Pregnancy Resource Center for free ultrasounds to determine the length of the baby's gestation. In other communities, a partnership exists between the Special Supplemental Nutrition Program for Women, Infants and Children [WIC] and Pregnancy Resource Centers, providing information about resources and services available to women in each location (Hussey, 2013).

Cooperation and coordination of efforts by both public and private organizations to provide holistic care to pregnant women who experience an unintended pregnancy could provide options for women who may need additional services beyond what can be obtained solely through traditional healthcare provider options. While faith-based services may not be appropriate for all individuals, this study indicates services at Pregnancy Resource Centers can be associated with better health-promoting behaviors for some women.

### Conclusions

Pregnant women who visit Pregnancy Resource Centers include women who vary in many ways including for instance, age, educational level, family structure, pregnancy intention, and religiosity. Though it is unknown why women first visit the centers, many pregnant women do come to receive some sort of free services that are provided there. Nurses, including faith-community nurses, have the opportunity to offer educational

programs to meet specific needs of the pregnant women who visit the centers and to assist in making referrals to prenatal care (Balint & George, 2015). Although Pregnancy Resource Centers are usually affiliated with the Christian faith, women of all religions and with no religion visit the centers for the services provided.

While there are variations in the levels of religiosity of the pregnant women who attend Pregnancy Resource Centers, higher levels of religiosity did have a significant relationship with more frequent health-promoting behaviors in this sample of pregnant women. Collaboration and cooperation within public and private organizations, including Pregnancy Resource Centers, to provide holistic care for pregnant women could offer a valuable approach to care of pregnant women, including some women who report unintended pregnancies.

APPENDICES

Appendix A
Research Information Form

We will be conducting a research study on the health practices and religious faith of pregnant women at Pregnancy Resource Centers.  The research will include completing an online survey here at the center.  You must be able to read and write English.  If you would like to participate in filling out the survey, here are a few questions?

1.  Are you 18 years or older?
   ☐ Yes      ☐ No

2.  When did you find out you were pregnant? _____ Have you known about this pregnancy for two months or more?
   ☐ Yes      ☐ No

If you are 18 years or older, have known you are pregnant for two months or more, and can read and write English, you can participate in the study!  When you participate you will be helping us learn more about how to help pregnant women.  Also, when the survey is complete, you can enter to win a drawing for a $50 gift certificate.  It's just a little thank you for your time.

☐  I would like to take the survey now.

☐  No thank you, I do not want to participate.

☐  I would like more information.

If you have questions about participating in the survey, please call Natalie Cyphers PhD (c), RN, the researcher, at 484-515-5200.

1. How old are you now (in years)? _____

2. What race do you consider yourself to be? (You may select more than one of these categories.)

    ☐ White
    ☐ Black or African American
    ☐ Asian
    ☐ Native Hawaiian or Other Pacific Islander
    ☐ American Indian or Alaska Native
    ☐ Other race

3. Do you consider yourself to be of Hispanic, Latino, or Spanish origin?

    ☐ No, not of Hispanic, Latino, or Spanish origin
    ☐ Yes, Mexican, Mexican American, Chicano
    ☐ Yes, Puerto Rican
    ☐ Yes, Cuban
    ☐ Yes, other Hispanic, Latino, or Spanish origin

4. What is your marital status?

    ☐ Married
    ☐ Never married not living with partner
    ☐ Never married living with partner
    ☐ Divorced not living with partner
    ☐ Divorced living with new partner
    ☐ Separated
    ☐ Widowed

5. What was your total household income last year, from all sources?

    ☐ less than  $5,000
    ☐ $5,000-9,999
    ☐ $10,000-14,999
    ☐ $15,000-19,999
    ☐ $20,000-29,999
    ☐ $30,000-39,999
    ☐ $40,000-49,999
    ☐ $50,000-59,999
    ☐ $60,000-$69,999
    ☐ $70,000-79,999
    ☐ $80,000-89,999
    ☐ $90,000-99,999

&#9633; greater than $100,000

6. What is the highest grade you completed? _____

7 If you went to college, how many years did you complete?_____

8. What is the highest degree you have earned? _____

9. How many total pregnancies have you had? _____

10. How many live children have you given birth to? _____

11. How many weeks pregnant are you (count from last menstrual period) _____

12. How long have you known you are pregnant? _____

   (please write if this is in days, weeks or months)

Appendix C
Duke University Religion Index

Duke University Religion Index. (Koenig & Bussing, 2010, p. 79)

1.  How often do you attend church or other religious meetings?

> 1- Never; 2-Once a year or less; 3- A few times a year; 4-A few times a month; 5-
>
> Once a week; 6-More than once a week.

2.  How often do you spend time in private religious activities, such as prayer, meditation

or Bible study?

> 1- Rarely or Never; 2-A few times a month; 3- Once a week; 4-Two of more
>
> times/week; 5-Daily; 6-More than once a day.

The following section contains 3 statements about religious beliefs or experiences.

Please mark the extent to which each statement is true or not true for you.

3.  In my life, I experience the presence of the Divine (i.e. God)

> 1- Definitely *not* true; 2-Tends *not* to be true; 3- Unsure; 4-Tends to be true; 5-
>
> Definitely true of me

4.  My religious beliefs are what really lie behind my whole approach to life.

> 1- Definitely *not* true; 2-Tends *not* to be true; 3- Unsure; 4-Tends to be true; 5-
>
> Definitely true of me

5. I try hard to carry my religion over into all other dealings in life.

> 1- Definitely *not* true; 2-Tends *not* to be true; 3- Unsure; 4-Tends to be true; 5-
>
> Definitely true of me

Permission to Use the Duke University Religion Index

RE: Use of the Duke University Index of Religiosity

Harold Koenig, M.D. <harold.koenig@duke.edu>
Mon 11/11/2013 8:15 AM
To:
Linda K. George, Ph.D. <linda.george@duke.edu>;
Cyphers, Natalie;
You replied on 11/11/2013 8:44 AM.
Natalie – you have permission to use the DUREL.  See attached for scale, scoring, and psychometrics.  HK

**From:** Linda K. George, Ph.D.
**Sent:** Monday, November 11, 2013 12:09 AM
**To:** Cyphers, Natalie
**Cc:** Harold Koenig, M.D.
**Subject:** RE: Use of the Duke University Index of Religiosity

Dear Ms. Cyphers,

Dr. Harold Koenig is the primary architect of the DUREL.  I know that he will give you permission to use the scale, but it is our policy that he be the person to do so.  I have copied Dr. Koenig on this email and am confident that he will complete the permission process very quickly.

Good luck with your research!

Linda K. George
Professor of Sociology
Duke University

Appendix E
Religious Surrender and Attendance Satisfaction Scale

1.  When my understanding of a problem conflicts with God's revelation (this means that God showed you something), I will submit to God's definitions
 ☐ Never True of Me
 ☐ Occasionally true of me
 ☐ Fairly often true of me
 ☐ Very often true of me
 ☐ Always true of me

How do you feel about your rating on this item (Question above)?
 ☐ I wish this were less true of me
 ☐ I am satisfied with my rating
 ☐ I wish this were more true of me

2.  Although I may not see results from my labor (this means work that you do. It's not talking about birthing a baby), I will continue to implement God's plans as long as God directs me to do so
 ☐ Never True of Me
 ☐ Occasionally True of Me
 ☐ Often True of Me
 ☐ Very Often True of Me
 ☐ Always True of Me

How do you feel about your rating on this item (Question above)?
 ☐ I wish this were less true of me
 ☐ I am satisfied with my rating
 ☐ I wish this were more true of me

3.  How often do you go to religious services?
 ☐ Never
 ☐ 1-2 times a year
 ☐ Every month
 ☐ 1-2 times a month
 ☐ Every week
 ☐ More than 1 time/week

How do you feel about your rating on this item (Question above)?
 ☐ I wish this were less true of me
 ☐ I am satisfied with my rating
 ☐ I wish this were more true of me

HEALTH-PROMOTING LIFESTYLE PROFILE II
DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits.  The questions about exercise *refer to exercises appropriate for women during pregnancy that do not overexert or exhaust a pregnant woman*
Please respond to each item as accurately as possible, and try not to skip any item.
Indicate the frequency with which you engage in each behavior by circling:

N for never, S for sometimes, O for often, or R for routinely

| | | |
|---|---|---|
| 1. | Discuss my problems and concerns with people close to me. | N S O R |
| 2. | Choose a diet low in fat, saturated fat, and cholesterol. | N S O R |
| 3. | Report any unusual signs or symptoms to a physician or other health professional | N S O R |
| 4. | Follow a planned exercise program. | N S O R |
| 5. | Get enough sleep. | N S O R |
| 6. | Feel I am growing and changing in positive ways. | N S O R |
| 7. | Praise other people easily for their achievements. | N S O R |
| 8. | Limit use of sugars and food containing sugar (sweets). | N S O R |
| 9. | Read or watch TV programs about improving health. | N S O R |
| 10. | Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber). | N S O R |
| 11. | Take some time for relaxation each day. | N S O R |
| 12. | Believe that my life has purpose. | N S O R |
| 13. | Maintain meaningful and fulfilling relationships with others. | N S O R |
| 14. | Eat 6-11 servings of bread, cereal, rice and pasta each day. | N S O R |
| 15. | Question health professionals in order to understand their instructions. | N S O R |
| 16. | Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week). | N S O R |
| 17. | Accept those things in my life which I cannot change. | N S O R |
| 18. | Look forward to the future. | N S O R |
| 19. | Spend time with close friends. | N S O R |
| 20. | Eat 2-4 servings of fruit each day. | N S O R |

| | | | |
|---|---|---|---|
| 21. | Get a second opinion when I question my health care provider's advice. | N S O R |
| 22. | Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling) | N S O R |
| 23. | Concentrate on pleasant thoughts at bedtime. | N S O R |
| 24. | Feel content and at peace with myself. | N S O R |
| 25. | Find it easy to show concern, love and warmth to others. | N S O R |
| 26. | Eat 3-5 servings of vegetables each day. | N S O R |
| 27. | Discuss my health concerns with health professionals. | N S O R |
| 28. | Do stretching exercises at least 3 times per week. | N S O R |
| 29. | Use specific methods to control my stress. | N S O R |
| 30. | Work toward long-term goals in my life. | N S O R |
| 31. | Touch and am touched by people I care about. | N S O R |
| 32. | Eat 2-3 servings of milk, yogurt, or cheese each day. | N S O R |
| 33. | Inspect my body at least monthly for physical changes/danger signs. | N S O R |
| 34. | Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking). | N S O R |
| 35. | Balance time between work and play. | N S O R |
| 36. | Find each day interesting and challenging. | N S O R |
| 37. | Find ways to meet my needs for intimacy. | N S O R |
| 38. | Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, or nuts group each day. | N S O R |
| 39. | Ask for information from health professionals about how to take good care of myself. | N S O R |
| 40. | Check my pulse rate when exercising. | N S O R |
| 41. | Practice relaxation or meditation for 15-20 minutes daily. | N S O R |
| 42. | Am aware of what is important to me in life. | N S O R |
| 43. | Get support from a network of caring people. | N S O R |
| 44. | Read labels to identify nutrients, fats, and sodium content in packaged food. | N S O R |
| 45. | Attend educational programs on personal health care. | N S O R |
| 46. | Reach my target heart rate when exercising. | N S O R |
| 47. | Pace myself to prevent tiredness. | N S O R |

| 48. | Feel connected with some force greater than myself. | N  S  O  R |
| 49. | Settle conflicts with others through discussion and compromise. | N  S  O  R |
| 50. | Eat breakfast. | N  S  O  R |
| 51. | Seek guidance or counseling when necessary. | N  S  O  R |
| 52. | Expose myself to new experiences and challenges. | N  S  O  R |

# Appendix G
## Permission to Use the Health-Promoting Lifestyle Profile II

**University of Nebraska Medical Center**

COLLEGE OF NURSING
Community-Based Health Department
985330 Nebraska Medical Center
Omaha, NE 68198-5330
402/559-6382
Fax: 402/559-6379

Dear Colleague:

Thank you for your interest in the *Health-Promoting Lifestyle Profile II.* The original *Health-Promoting Lifestyle Profile* became available in 1987 and has been used extensively since that time. Based on our own experience and feedback from multiple users, it was revised to more accurately reflect current literature and practice and to achieve balance among the subscales. The *Health-Promoting Lifestyle Profile II* continues to measure healthpromoting behavior, conceptualized as a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization and fulfillment of the individual. The 52-item summated behavior rating scale employs a 4-point response format to measure the frequency of self-reported health-promoting behaviors in the domains of health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management. It is appropriate for use in research within the framework of the Health Promotion Model (Pender, 1987), as well as for a variety of other purposes.  The development and psychometric evaluation of the English and Spanish language versions of the original instrument have been reported in:

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. Nursing Research, 36(2), 76-81.

Walker, S. N., Volkan, K., Sechrist, K. R., & Pender, N. J. (1988). Health-promoting lifestyles of older adults:  Comparisons with young and middle-aged adults, correlates and patterns. Advances in Nursing Science,11(1), 76-90.

Walker, S. N., Kerr, M. J., Pender, N. J., & Sechrist, K. R. (1990). A Spanish language version of the Health-Promoting Lifestyle Profile. Nursing Research, 39(5), 268-273.

Copyright of all versions of the instrument is held by Susan Noble Walker, EdD, RN, FAAN, Karen R. Sechrist, PhD, RN, FAAN and Nola J. Pender, PhD, RN, FAAN. The original *Health-Promoting Lifestyle Profile* is no longer available. You have permission to download and use the HPLPII for non-commercial data collection purposes such as research or evaluation projects provided that content is not altered in any way and the copyright/permission statement at the end is retained. The instrument may be reproduced in the appendix of a thesis, dissertation or research grant proposal. Reproduction for any other purpose, including the publication of study results, is prohibited.  A copy of the instrument (English and Spanish versions), scoring instructions, an abstract of the psychometric findings, and a list of publications reporting research using all versions of the instrument are available for download.

Sincerely,
Susan Noble Walker, EdD, RN, FAAN
Professor Emeritus

Informed Consent

A person who is to participate in the research must give his or her informed consent to such participation. This consent must be based on an understanding of the nature and risks of the research. This document provides information that is important for this understanding. Research projects include only subjects who choose to take part. Please take your time in making your decision as to whether to participate. If you have questions at any time, please call the researcher, Natalie Cyphers, at 484-515-5200.

You are invited to be in a research study about the health promoting practices and religiousness of pregnant women at Pregnancy Resource Centers.  The purpose of this research study is to look at how religiousness and other things, like how old you are or how you feel about being pregnant, are related to health promoting behaviors in pregnant women.  By looking at these things we may be able to find ways to help women be healthier during pregnancy and also help babies be healthier.

Approximately 100 people will take part in this study.  Your participation in the study will last approximately 15 minutes.

When you mark "yes" on the bottom of the page, you will be indicating you agree to participate in the study.  The survey will ask you questions about your health practices, religiousness, and general questions about you and your pregnancy.  You can skip any question that you prefer not to answer.

There are no known risks to you or your baby if you participate in this study.  However, answering the questions may make you think about your own religiousness or health practices which could make you feel uncomfortable.  You could have those same feelings if someone asked you about those things in your day to day life.  However, if you are uncomfortable with any of the questions, you can choose to skip the question or stop the survey at any time.

You may not benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because we will have learned about the religiousness and health promotion of pregnant women at Pregnancy Resource Centers.

If you choose not to participate in the study, it will not impact your ability to receive services at the center.

You will not have any costs for being in this research study.

You also will not be paid for being in this research study.  However, when you complete the survey you will receive a gift certificate valued at five dollars or less. You can also enter to win a $50 gift certificate at the end of the survey.

The University of North Dakota and the research team are receiving no payments from other agencies, organizations, or companies to conduct this research study.

Your name will not be on any of the information that we ask about for this study.  No information that could identify you is saved with the survey.  All of the information will be kept private.  If we write a report or article about this study, we will describe the study results in a summarized manner so that you cannot be identified.

Your participation is voluntary. You may choose not to participate and you may discontinue your participation at any time without affecting the services you receive at this center.

The researcher conducting this study is Natalie Cyphers.  If you have questions about the research please contact Natalie Cyphers at 484-515-5200 or Dr. Elizabeth Tyree at 701-777-4522.   If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at **(701) 777-4279**. You may also call this number about any problems, complaints, or concerns you have about this research study.  You may also call this number if you cannot reach research staff, or you wish to talk with someone who is independent of the research team.  General information about being a research subject can be found by clicking "Information for Research Participants" on the web site: http://und.edu/research/resources/human-subjects/research-participants.cfm

I have read and understand the above consent form and desire of my own free will to participate in this study.
- ☐ Yes
- ☐ No

Appendix I
Categorization of Variables

Each variable was evaluated to determine the best method of categorizing the variable for data analysis. Several concerns were noted when women reported the number of services they received at the Pregnancy Resource Center. For example, 23 women wrote in responses such as "weekly", "every appointment" or "monthly" for the number of times they had received services, rather than an actual number. Women who reported "a couple" were recorded as two visits. Women who reported "several" were recorded as three visits. Some of the weekly visits were estimated based upon the number of visits the participant had since determining she was pregnant. However, to assure accuracy of the data, this variable was categorized to include, no visits, 1-5 visits, 6-10 visits and over 11 visits. While a pilot study was conducted, this unusual response pattern was not identified in the pilot study and therefore, could not be corrected during that time.

Another variable was answered in an unexpected manner by many women. When reporting religious affiliation, the responses available in the survey included Protestant, Catholic, Muslim, other, and no religion. However, 27.9% reported their religion as *other* and then wrote in Christian. Including Protestant, Catholic, and *Other* Christian responses, 75.6% (*n* = 65) of all participants reported they were of the Christian faith. Therefore, the religious affiliation variable was re-categorized to include Christian-Protestant, Christian–Catholic, Christian-other, other religion and no religion. For analysis, this variable was dichotomized to *Christian*, with all Christian categories considered together, and *other* indicating either other religion on no religion.

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In addition, several variables were dichotomized for data analysis. Age was dichotomized based upon the median value of 25 years, with 18-25 years and 26-39 years being the categories. Highest grade was dichotomized with 12$^{th}$ grade or less in one category and all other values in the second category to separate those with high school or lower education from those with higher educational attainment. Total numbers of pregnancies was dichotomized by one to two pregnancies in one category and three of more in the second category because 55% ($n = 47$) of the women had one or two pregnancies. The number of live children was dichotomized into zero and one child in one category and two or more in the second category as 70% ($n = 60$) of the women had either zero or one child. Weeks pregnant was dichotomized into 11-26 weeks and 27-39 weeks because 27 was the median and also 27 weeks is the beginning of the third trimester. Weeks known pregnant was dichotomized into 8-22 weeks and 23-29 weeks as the median value was 23 weeks.

UNIVERSITY OF **UND** NORTH DAKOTA

INSTITUTIONAL REVIEW BOARD
c/o RESEARCH DEVELOPMENT AND COMPLIANCE
DIVISION OF RESEARCH
TWAMLEY HALL ROOM 106
264 CENTENNIAL DRIVE STOP 7134
GRAND FORKS ND 58202-7134
(701) 777-4279
FAX (701) 777-6708

December 26, 2013

Natalie A. Cyphers
219 Moorestown Drive
Bath, PA 18014

Dear Ms. Cyphers:

We are pleased to inform you that your project titled, " Religiosity and Health-Promoting Behaviors of Pregnant Women at Pregnancy Resource Centers" (IRB-201312-222) has been reviewed and approved by the University of North Dakota Institutional Review Board (IRB). The expiration date of this approval is December 1, 2014.

As principal investigator for a study involving human participants, you assume certain responsibilities to the University of North Dakota and the UND IRB. Specifically, any adverse events or departures from the protocol that occur must be reported to the IRB immediately. It is your obligation to inform the IRB in writing if you would like to change aspects of your approved project, prior to implementing such changes.

When your research, including data analysis, is completed, you must submit a Research Project Termination form to the IRB office so your file can be closed. A Termination Form has been enclosed and is also available on the IRB website.

If you have any questions or concerns, please feel free to call me at (701) 777-4279 or e-mail michelle.bowles@research.und.edu.

Sincerely,

Michelle L. Bowles, M.P.A., CIP
IRB Coordinator

MLB/jle

Enclosures

## REPORT OF ACTION: EXEMPT/EXPEDITED REVIEW
### University of North Dakota Institutional Review Board

**Date:** 12/9/2013                    **Project Number:** IRB-201312-222

**Principal Investigator:** Cyphers, Natalie

**Department:** Nursing

**Project Title:** Religiosity and Health-Promoting Behaviors of Pregnant Women at Pregnancy Resource Centers

The above referenced project was reviewed by a designated member for the University's Institutional Review Board
on ___12/10/2013___ and the following action was taken:

☐ Project approved. **Expedited Review** Category No. _____

  Next scheduled review must be before: _____

  ☐ Copies of the attached consent form with the IRB approval stamp dated _____
  must be used in obtaining consent for this study.

☒ Project approved. **Exempt Review** Category No. _____2_____

  This approval is valid until ___DEC - 1 2014___ as long as approved procedures are followed. No
  periodic review scheduled unless so stated in the Remarks Section.

  ☐ Copies of the attached consent form with the IRB approval stamp dated ___N/A___
  must be used in obtaining consent for this study.

☐ Minor modifications required. The required corrections/additions must be submitted to RDC for review and
  approval. **This study may NOT be started UNTIL final IRB approval has been received.**

☐ Project approval **deferred. This study may not be started until final IRB approval has been received.**
  (See Remarks Section for further information.)

☐ Disapproved claim of exemption. This project requires Expedited or Full Board review. The Human Subjects
  Review Form must be filled out and submitted to the IRB for review.

☐ Proposed project is not human subjects research as defined under Federal regulations 45 CFR 46 or 21 CFR 50 and
  does not require IRB review.

  ☐ Not Research          ☐ Not Human Subject

**PLEASE NOTE:** Requested revisions for student proposals MUST include adviser's signature. All revisions
MUST be highlighted and submitted to the IRB within 90 days of the above review date.

☒ Education Requirements Completed. (Project cannot be started until IRB education requirements are met.)

cc: Dr. Elizabeth Tyree

_Michelle N Bowles_ 12/10/2013
Signature of Designated IRB Member        Date
UND's Institutional Review Board

If the proposed project (clinical medical) is to be part of a research activity funded by a Federal Agency, a special assurance
statement or a completed 310 Form may be required. Contact RDC to obtain the required documents.

(Revised 10/2006)

# PROTOCOL CHANGE FORM
## University of North Dakota Institutional Review Board

Please complete this form and attach revised research documents for any proposed change to your protocol, consent forms, or any supportive materials (such as advertisements, questionnaires, surveys, etc.). All changes must be highlighted. Any proposed change in protocol affecting human participants must be reviewed and approved by the IRB prior to implementation, except where an immediate change is necessary to eliminate a hazard to the participant.

**Principal Investigator:** Natalie A. Cyphers

Telephone: 610-509-6163          E-mail Address: Natalie.Cyphers@my.und.edu

Complete Mailing Address: 219 Moorestown Dr. Bath, PA 18014

School/College: University of North Dakota          Department: College of Nursing and Professional Disciplines

Project Title: Religiosity and Health-Promoting Behaviors of Pregnant Women at Pregnancy Resource Centers

**Proposal Number:** IRB- 201312-222          **Approval Date:** 12-26-2013

### THE CURRENT STATUS OF THE PROJECT IS (Check one)

X          Project currently in progress. Number of subjects enrolled is:     **72**

_____          Project not yet started. No subjects enrolled.

_____          Project closed to subject entry.

1. Briefly describe and explain the reason for the revision or amendment and the justification for the change. Include a copy of affected protocol pages and consent form with specific changes highlighted.

I am writing to request an extension of my IRB approval until December 9, 2016.

2. Does the change affect the study or subject participation (procedures, risks, costs, etc.)?          Yes     X     No

Please explain:

3. Does the change affect the consent document?          Yes     X     No

If yes, include the revised consent form(s) with the changes highlighted, and a clean copy of the revised consent form(s).

By signing below, you are verifying that the information provided in the Human Subjects Review Form and attached information is accurate and that the project will be completed as indicated.

Signatures:

_Natalie A. Cyphers_          10-13-14
Principal Investigator          Date:

_Elizabeth Tyree_          10/15/14
Student Adviser (if applicable)          Date:

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