CANCER AND PSYCHOLOGICAL DISTRESS: EXAMINING THE ROLE OF NEIGHBORHOOD SOCIAL COHESION

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by

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CHAPTER I
INTRODUCTION AND STATEMENT OF PURPOSE

Cancer affects many individuals worldwide and is one of the leading causes of mortality (World Health Organization [WHO] 2017). In general, cancers can have many causes, ranging from genetic mutations to behavioral risk factors (Else-Quest and Jackson 2014). In the current study, I focus on two different types of cancer: breast and cervical. While the causes of breast cancer vary from individual to individual (i.e., some individuals develop breast cancer from risky behaviors while others develop breast cancer from genetics or “bad luck”), 99% of cases of cervical cancer are caused by the human papillomavirus (HPV), a sexually-transmitted infection (STI) (Dyer 2010; Albini et al. 2015). As such, cervical cancer has the “stigma of self-earned illness” (Kleinman 1988:21-22), while breast cancer can develop from genetic mutations and is considered a “blameless” disease (Dyer 2010; Bell 2014). Therefore, some individuals may feel stigmatized or be stigmatized by others if they are diagnosed with a cancer that is directly linked to individual behavior (e.g., smoking, unsafe sex). In cases of illnesses that are seen as preventable, stigmatization from others may lead some cancer patients to socially isolate themselves or feel socially isolated from others, resulting in reduced perceptions of social support (Drapeau et al. 2012). This study specifically explores the way in which perceptions of social support within the community impacts the relationship between more or less stigmatized cancers and psychological distress.

Social integration, particularly in neighborhoods and communities, has shown to be beneficial for physical and mental health (Durkheim 1897; Yamasaki et al. 2017). The social
environment of neighborhoods, which consists of individual’s perceptions of the degree of social integration and support, can lead to one feeling like they belong and are connected with their neighbors (Gomez et al. 2015). The general thrust of this research suggests that as a form of social support at the community level, individuals may perceive their neighborhood as closely-knit and socially cohesive which may elicit feelings of connectedness (Kawachi and Berkman 2000). A supportive community can help individuals going through a stressful life event, such as cancer, by offering opportunities for emotional support and a sense of psychological belonging (Yamasaki et al. 2017). Thus, perceptions of neighborhood cohesion could potentially help to reduce feelings of psychological distress (Stansfeld 2006). The focal point of this project is the way in which perceptions of communitive supportiveness and interconnectedness can alleviate some of the distress brought on by a breast or cervical cancer diagnosis. To date, research has not yet considered this relationship (Gomez et al. 2015).

Drawing on the stress process model as a theoretical framework, my study contributes to the literature in two ways. I first examine how “stigmatized” and “blameless” cancer diagnoses result in psychological distress. Secondly, drawing from potential moderators outlined by the stress process model, I assess how this relationship might be moderated by social support as reflected in perceptions of community cohesion. Specifically, this research addresses the following questions: (1) Do women with a stigmatized disease (i.e., cervical cancer) experience greater psychological distress than women with a disease perceived as blameless (i.e., breast cancer)? and, (2) Do perceptions of neighborhood social cohesion moderate the effect of a cancer diagnosis on psychological distress?

The findings from this project have the potential to inform public health professionals about the benefits of focusing interventions at the neighborhood level, in addition to the
individual level, in order to alleviate mental health disparities between more or less stigmatized cancer groups. Rather than employing individually based intervention, researchers should focus on developing interventions that consider the structural factors that influence individual outcomes, thus reaching a wide variety of people (Link and Phelan 1995). By looking at differential mental health outcomes based on cancer etiologies and associated blame, researchers can identify and focus on those individuals with cancers who may be more vulnerable to feelings of social isolation and in need of effective social support. Interventions that focus on increasing interaction between residents in neighborhoods, which promotes community attachment and a sense of belonging, could help those who are especially vulnerable to greater psychological distress (Van Gundy et al. 2011; Eldredge et al. 2016).
CHAPTER II
LITERATURE REVIEW

Stress Process Model

Pearlin and colleagues (1981) developed the stress process model as a way to explain the relationship among stressors, social support, and mental health outcomes. According to Pearlin (1989), a stressor is an experience that takes the form of life events or chronic strains. Both life events and chronic strains have been studied separately in order to assess the effectiveness of social support and coping resources (Thoits 1995). However, scholars recognize that these stressors seldom occur separately (Carr and Umberson 2003). In most situations, life events may create chronic strains, or chronic strains may lead to a life event, often referred to as stress proliferation (Pearlin and Bierman 2013).

Cancer is regarded as a chronic stressor because it is a disease that, once developed, is persistent and takes the lives of many individuals (Dunkle-Schetter 1984; Wortman 1984). It can also create related strains, such as financial, physical health, and mental health problems. In this regard, cancer is considered a life event that creates new chronic strains throughout the life course (Dunkle-Schetter 1984). Prior literature has found that the impact of a cancer not only changes individuals’ lives from the moment of diagnosis to possible remission, but it also affects them for the rest of their lives (Dunkel-Shetter 1984; Frank 1995; Bloom 2002; Deimling et al. 2006). In their study on long-term cancer survivors, Deimling and colleagues (2006) found that no matter the number of years after becoming cancer-free, cancer survivors never let go of the
worry surrounding their cancer. However, literature has been sparse in recognizing the impact of different etiologies of cancer on support and mental health outcomes.

Pearlin (1989) argued that research on the stress process should focus on the contextual aspect of individuals’ experiences and the way in which this context shapes their coping and social support resources. Since then, scholars have heeded Pearlin’s call for attention to context, specifically, in the form of neighborhoods (Van Gundy et al. 2011; Hill and Maimon 2013; Wheaton et al. 2013). As a meso-level context, neighborhoods provide individuals with social ties and social support that can benefit mental health (Cutrona et al. 2006; Wheaton et al. 2013). However, in situations when one lacks social ties and social support in the neighborhood context, this could lead to increased psychological consequences (Hill and Maimon 2013). The literature shows that this relationship between neighborhood context and mental health outcomes is becoming a more frequent topic in the stress process and a growing conversation for cancer research (Van Gundy et al. 2011; Hill and Maimon 2013; Gomez et al. 2015). Although on the rise in terms of understanding how the neighborhood contexts influences various relationships, research is still needed on perceptions of neighborhood contexts across subgroup variations (Hill and Maimon 2013). Thus, this research aims to identify variations across different cancers depending on the social context within neighborhoods.

Research using the stress process model notes the unequal distribution of stress: those with lower social status respond to chronic stressors with greater levels of distress (Turner and Marino 1984). This idea illustrates differential vulnerability which is often utilized in the stress process literature. In contrast, differential exposure refers to those of lower status experiencing more stressors than their counterparts (Thoits 1995). The focus of this project is on the differential vulnerability hypothesis which predicts that those of lower social status, namely
those with more stigmatized cancers, will experience greater levels of psychological distress. In addition, this distress may be further exacerbated by inequality in accessing effective coping resources and avenues for social support (Thoits 1995). Groups that are discriminated against or perceive themselves as stigmatized may experience greater distress than those not labeled (Link et al. 1991). In an attempt to reduce the emotional response to the stressor, individuals utilize coping resources and social support. However, the variation in availability and effectiveness of these resources are different for groups that are and are not stigmatized (Link et al. 1991). In the following sections, I highlight the differences in stigmatization of breast cancer and cervical cancer, which I argue could lead to dissimilar mental health outcomes depending on the degree of interconnectedness within the community.

Breast Cancer and Cervical Cancer

As the most frequently diagnosed cancer and the second-leading cause of death among women, breast cancer affects hundreds of thousands of women each year. Breast cancer impacts about 1 in 8 women throughout the life course in the U.S. (DeSantis et al. 2014). There are several risk factors for developing breast cancer, including obesity, lack of physical activity, alcohol use, excessive cigarette smoking, and other adjustable life factors (e.g., postmenopausal hormone use) (ACS 2017). Additionally, breast cancer may also emerge from old age or inherited genetic mutations (e.g., BRCA1 and BRCA2 genes). Medical providers have started urging annual mammogram check-ups at the age of 40 to take precautionary actions against this highly prevalent cancer. Due to the high incidence rate of breast cancer in general, it is a widely studied and researched topic.

Following breast, lung, and colorectal cancer, the fourth most common cancer found in women across the globe is cervical cancer (ACS 2017). The frequency of newly diagnosed cases
of cervical cancer has declined immensely in the past decades for reasons similar to those regarding breast cancer within the U.S. (e.g., increased screening, early detection). However, cervical cancer continues to be a threat to women worldwide, responsible for a steady rate in deaths among women in recent decades (ACS 2017). Almost all cases of cervical cancer (about 99%) are caused by human papillomavirus (HPV) (Dyer 2010). HPV is a common sexually-transmitted infection (STI), but not all women that contract HPV in their lifetime will develop cervical cancer. Considering only 6.5 per 100,000 women are diagnosed with cervical cancer each year, HPV rarely becomes cervical cancer. (ACS 2017). The reason that some women develop cervical cancer from their HPV infection lies in different immune responses to the infection (ACS 2017).

While the risk of developing cervical cancer is relatively low, the risk of contracting HPV is at an all-time high for women (ACS 2017). As the most commonly occurring STI for women, HPV is most likely to affect individuals who are sexually active, especially those who are sexually active at a young age or those that have many sexual partners (ACS 2017). Women typically find out about their HPV status when they receive an abnormal Pap test (a test to check for abnormal cells) as part of a routine gynecological exam. Based on this correlation between HPV and cervical cancer, there is a behavioral factor attached to the diagnosis that is unlike that of breast cancer: sexual activity. The general public seems unaware of this causal relationship and any of the important repercussions of HPV (Shepherd and Gerend 2014; Blake et al. 2015), although awareness of this causal link has increased in recent years due to public health interventions and media advertisement campaigns concerning the consequences of HPV (Schiffman and Saraiya 2017).
Cancer and Stigma

Drawing on Goffman (1963) and the three factors that lead to stigma (physical abnormalities, blemishes of individual behavior, and tribal membership), the focus in this paper is the felt or enacted stigma related to blemishes of individual behavior and the ways in which it interacts with mental health outcomes within the stress process model. Felt stigma refers to the internalization of being discriminated or the fear of discrimination occurring because of stigma (Goffman 1963). Alternatively, enacted stigma refers to the act of discrimination of individuals because of stigma (Goffman 1963). When individuals experience stigmatization, it is likely due to a label given to them when interacting with others (Link and Phelan 2013). The label and stigma attributed to an individual may lead to a loss in social status and, consequently, discrimination from others (Link et al. 2004). When discrimination occurs, individuals are rejected, devalued, and excluded by others, which results in increased levels of distress (Link et al. 2004). Individuals may use methods such as secrecy and withdrawal if they are anticipating discrimination due to their associated stigma (Link et al. 1991). By withdrawing, individuals deny others the opportunity to reject and stigmatize them (Link et al. 1991).

Past research finds that cancer is a stigmatized disease, which may lead individuals with cancer to experience discrimination from others (Else-Quest and Jackson 2014). However, research also shows that stigma associated with cancer is complex and multifaceted in that particular types of cancers are associated with more or less stigma (Lebel and Devins 2008; Marlow et al. 2010). In a review of literature related to stigmatization and cancer types, Lebel and Devins (2008) categorized a variety of cancers, distinguishing those not clearly influenced by individual behavior from those that are. They placed breast cancer under the category of cancers that are not influenced by individual behavior, whereas cervical cancer was lumped with
lung cancer, where individuals clearly contributed to their diseases (Lebel and Devins 2008). Lebel and Devins (2008) justified their classification of breast cancer by suggesting that the etiology of breast cancer was not as clear cut as the etiology of lung cancer or cervical cancer.

For breast cancer, stigma is contingent on the general physical abnormalities associated with cancer more broadly (e.g., chemotherapy-induced alopecia and physical limitations), rather than being related to individual behaviors that caused the disease (Lebel and Devins 2008; Else-Quest and Jackson 2014). This is even further the case if a woman opts for a mastectomy (removal of breast tissue) as a treatment for breast cancer, where stigma arises due to the absence of a stereotypically feminine physical trait (Else-Quest and Jackson 2014). While the stigma associated with breast cancer is still felt by breast cancer patients, it is lessening with the increased public awareness from national efforts such as Breast Cancer Awareness Month and the “wear pink” campaign (Sharf 2001; Gulyn and Youssef 2010). Sharf (2001) argued that due to the very public, personal stories that many high-profile people (e.g., actresses, government officials) are telling about their illness experiences, breast cancer is becoming less stigmatized. Furthermore, the increase in awareness has proliferated the amount of funding for research and availability of social support to help with the well-being of the patient (Else-Quest and Jackson 2014). Social support for breast cancer patients has also increased within communities by implementing an increase in advocacy groups and social support groups (Bell 2014).

Stigmatization of cervical cancer stems from having a “preventable” cancer whose onset many people attribute to risky sexual behavior, such as unprotected sex and multiple sex partners (Perrin et al. 2006; Kahn et al. 2007; Dyer 2010; Shepherd and Gerend 2014). Further, the guilt and shame felt by cervical cancer patients has risen since the introduction of vaccines for HPV in 2006 (Dyer 2010). The promotional strategy of the vaccinations for HPV tends to emphasize
preventative action to eliminate the potential for developing cervical cancer (Dyer 2010). This strategy has shifted the experience of cervical cancer patients from one of internal guilt and shame to one of enacted stigma. Recent work suggests that public awareness of the linkage between HPV and cervical cancer has increased experiences of enacted stigma among patients (Blake et al. 2015). Qualitative research on the stigma of cervical cancer shows that when friends and family members are unaware of the link to HPV, the women with cancer feel supported (Dyer 2010). This perception changes when others learn of the link between cervical cancer and HPV (Dyer 2010).

Compared to other types of cancers, women with cervical cancer are blamed more for their diagnosis than women with a breast cancer diagnosis (Marlow et al. 2010). Although breast cancer is mostly caused by individual behavioral factors, many people do not think that women with breast cancer can be blamed for contributing to their diagnosis. Marlow and colleagues (2010) give several explanations for this finding. First, the heritability of breast cancer may influence the fear of unpredictability and control of the disease. Secondly, due to the high prevalence of this disease, many people personally know someone with breast cancer, reducing the perceived culpability of the person.

Additional research has found that the influence of a cervical cancer diagnosis leads to stigmatizing behaviors from society in general (e.g., advertising for HPV, lack of funding for research) (Wenzel et al. 2005; Dyer 2010; Shepherd and Gerend 2014). Due to the concealable nature of cervical cancer, women may choose not to tell others in their community of their diagnosis because of the connection with HPV (Dyer 2010). According to Link and Phelan (2013), having a concealable illness allows an individual to decide when, how, and what to disclose to others about their illness. Regarding cervical cancer, Dyer (2010) found that some
women may lie about their cancer type (i.e., tell other people that they have uterine cancer) to ease the feeling of embarrassment resulting from the accompanying shame and stigma of their diagnosis. In this sense, the stigmatization of this disease may inhibit women from disclosing their cancer diagnosis. As such, this lack of disclosure limits the resources or emotional support that they can gain from being connected within their community (Dyer 2010).

Cancer and Distress

In previous studies on cancer and psychological distress, research mostly focuses on cancer patients in comparison to individuals without cancer (Hoffman and Recklitis 2009). This is problematic due to some cancers having different etiologies based on the cancer type, making each illness experience fundamentally unique (Lebel and Devins 2008). Lumping all cancers into one category is impractical because of the biological, psychological, and sociological differences between each cancer (Zabora et al. 2001). In studies comparing gynecological cancers, women with cervical cancer significantly expressed more feelings of anxiety and depression (Bradley et al. 2006; Herzog and Wright 2007). Bradley and colleagues (2006) argued that increased distress may be related to the life-style aspect (i.e., risky sexual behavior) that contributed to their diagnosis. Similarly, Wenzel et al. (2005) reported that women who survived cervical cancer and reported greater amounts of distress also were more likely to report lower levels of social support.

Research has explored the importance of social support on mental health outcomes for individuals experiencing felt and enacted stigma due to their cancer (Drapeau et al. 2012; Zabora et al. 2001). Having a cancer that is stigmatized may lessen the amount of perceived support, both at the individual and community levels (Dyer 2010). Much of the literature concerning

\footnote{Wenzel and colleagues’ study (2005) did not include a measure of stigmatization.}
social support as a moderator of the relationship between cancer and distress centers on informal, personal support (Wortman 1984). Specifically, research focuses on social support that abides by the definition provided by House (1981) in which support comes in the form of emotional, appraisal, informational, and instrumental support. However, House (1981) also argued that another key component in individual’s coping with stress is that they feel as if they are a part of a supportive community with mutual help and assistance. This leaves an opportunity for research to examine the effect of community social support as a moderator of this relationship. Previous research has examined the implications of social cohesiveness on mortality, disease prevalence, and mental health (Wen and Christakis 2005; Kerrigan et al. 2006; Jung et al. 2013; Murillo et al. 2016); however, to my knowledge, there is currently no research that investigates the extent to which perceptions of neighborhood social cohesion moderates the effect of a cancer diagnosis on psychological distress.

Similar to the stigma associated with cervical cancer, individuals with other diseases, like HIV, experience psychological distress and issues with social support, such as living in social isolation (Earnshaw et al. 2015). Researchers have found that community interventions that foster improving perceptions of neighborhood cohesion for individuals with HIV are beneficial for mitigating the effects of stigma on depression (Palmer et al. 2011). In light of this finding, women diagnosed with cervical cancer may be aware and ashamed by the link between their cancer and HPV which could cause them to distance themselves from their community (Dyer 2010). Consequently, this lack of community support may lead them to feel increased amounts of psychological distress.
Neighborhood Social Cohesion as Social Support

According to Berkman and Glass (2000), social support is often viewed at the individual level and is perceived to take the shape of many different forms. At the community level, social support may come in the form of neighborhoods or institutional affiliations (Berkman and Glass 2000). As a form of social support, social cohesion at the community level could have similar beneficial properties of informal social support, like from friends or spouses (Kawachi and Berkman 2000). Neighborhood social cohesion represents the mutual trust and support within a community that leads individuals within the community to feel connected and supported by one another (Kawachi and Berkman 2000). Boardman (2004) argued that an individual’s neighborhood could potentially bolster or eliminate the effect of stress on health. The consistent interactions and sense of connectedness with neighbors is not only beneficial, but some neighborhoods might be able to provide valuable resources to help influence health (Boardman 2004). Additionally, there are greater opportunities and availability for accessing health care services and information for individuals living in a highly cohesive and close-knit community (Frumkin et al. 2004).

Within this project, I explore perceptions of neighborhood social cohesion as a form of social support that moderates the relationship between a stressor and an outcome. Typically, when neighborhood social cohesion is examined, scholars use the term collective efficacy. Social cohesion is often embedded in the larger concept of collective efficacy (i.e., social control and social cohesion) (Sampson et al. 1997). However, it is useful for researchers to separate social cohesion and social control to understand the processes of both individually. Focusing solely on social cohesion, previous literature has illustrated the importance of studying this concept as its
own distinct phenomenon in order to capture feelings of social connectedness felt by individuals in their community (Sampson 1991; Kawachi et al. 1997; Lochner et al. 1999; Friedkin 2004).

Referring back to the stress process model that posits that social support can act like a moderator, I argue that as a form of social support, social cohesion moderates the relationship between cancer and distress. Working not as a mediator (that is, directly influencing mental health), perceptions of social cohesion functions as a moderator that affects the impact of cancer on mental health. Social connectedness and a sense of community has been shown to be beneficial for coping with a stressful life event and decreasing feelings of distress (Yamasaki et al. 2017). By allowing opportunities for individuals to feel supported through their community, neighborhoods can potentially act as a buffer between a stressful life event and mental health outcomes. With verbal and nonverbal support, cohesive communities can give individuals emotional support as well resources that foster a healthy mindset (Yamasaki et al. 2017).

However, the support within a community may be lessened for individuals experiencing a stigmatized illness (Ramirez-Valles et al. 2005). For individuals with a chronic stressor, such as cancer, interconnectedness with others can help mitigate the effects of the diagnosis on psychological distress. Considered as an individual-level sense of support and connected within a meso-level context, neighborhood social cohesion acts to benefit social well-being and community interconnectedness (Van Gundy et al. 2011).

Within this project, the social support within neighborhoods may play a role in influencing the relationship between a cancer diagnosis (i.e., chronic stressor) and psychological distress. Perceptions of neighborhood social cohesion serves as a proxy for other forms of social support in this study. Individuals can work together and support one another to impact health related behaviors and feelings of social connectedness in a socially cohesive neighborhood (Fone
et al. 2007). Individuals may develop depression when they feel lonely or isolated from their friends, family, or close-knit community (Frumkin et al. 2004). Moreover, socially isolated individuals are more likely to live in an area that has fewer strong bonds and fewer opportunities to access mental health care services (Kawachi and Berkman 2000).

Supplementary Factors

There are other influences on cancer, perceptions of neighborhood social cohesion, and distress that need to be addressed. First, there are differences in the median age at diagnosis, racial composition, and incidence and mortality rates of breast and cervical cancer. According to cancer trends, breast cancer is typically diagnosed among women that are middle-aged and older (median age at diagnosis of 62 years), while cervical cancer is diagnosed among women that are middle-aged and younger (median age at diagnosis is 49 years) (National Cancer Institute 2014). Although the mortality rate of breast cancer is declining for both white and black women (and has been for decades), the frequency of new diagnoses remains constant for white women, but increases by 0.5% each year for black women (American Cancer Society [ACS] 2017). Conversely for cervical cancer, the incidence rate has remained constant for white women; however, the rate for black women has declined by about 3% (ACS 2017). Cervical cancer has previously been labeled as a “disease of disparity” due to its incidence and mortality rate being associated with race/ethnicity and socioeconomic position. In contrast to breast cancer, whose population is more likely to consist of older individuals of higher socioeconomic position, women who have cervical cancer tend to be younger, black, and poor (Newmann and Garner 2005). This is likely because race/ethnicity and socioeconomic status influence opportunities to access services and treatment for cervical cancer and healthcare in general (Newmann and Garner 2005).
Consistent with literature surrounding the stress process model specifying that demographic and socioeconomic characteristics influence responses to stressors, research on cancer has found differences across several factors. For individuals with cancer, those who are older, white, with high income and education, employed full time, and are married experience less distress than their counterparts (Bloom 1992; Epping-Jordan 1999; Zabora et al. 2001; Culver et al. 2002). Further, those with better health following the cancer diagnosis typically also have better mental health outcomes (Antoni 2013).

As a form of social support, neighborhood social cohesion can influence the effect of a stressor on mental health, however, the perceptions of the neighborhood can be affected by several other factors beyond a cancer diagnosis. Prior literature has found that being older, married, white, employed full-time, with high income and education contributes to being more integrated in the neighborhood and perceiving your neighborhood as close-knit (Austin and Baba 1990; Adams and Serpe 2000; Dassopoulos and Monnat 2011). Further, those that live longer in their neighborhood and own their house feel more embedded in their neighborhood (Schulz et al. 2006). To the extent that the data allows, I account for these various factors that impact the experience of breast and cervical cancer.

Hypotheses

I expect the findings of this project to match the findings in the few previous studies that compared breast cancer and lung cancer: women with breast cancer experienced lower psychological distress due to the hope and sympathy embedded in the awareness of the cancer (Wassenaar et al. 2007; LoConte et al. 2008; Else-Quest et al. 2009; Gulyn and Youssef 2010; Sriram et al. 2015). The prevalence and prominence of breast cancer has resulted in increased visibility and sympathetic attitudes from others concerning the disease (Bell 2014). In this
regard, the support and sympathy from others significantly influences feelings of psychological distress; however, for cancers that are viewed as caused by individual behavior (e.g., cervical cancer and lung cancer), feelings of psychological distress are greater (Gulyn and Youssef 2010). Additionally, differences in social support, specifically at the community level, could affect the amount of psychological distress experienced by the individual with cancer (Yamasaki et al. 2017).

Within this project, I assess community supportiveness and feelings of social connectedness as reflected in perceptions of social cohesion within an individual’s neighborhood. Neighborhoods perceived as more cohesive could provide better social support for individuals with certain types of cancers (Van Gundy et al. 2011). Further, due to the perceived cohesiveness of their neighborhoods in response to a cancer diagnosis, feelings of psychological distress could potentially be reduced (Van Gundy et al. 2011). In summary, the purpose of the study is to investigate if there are differences in psychological distress of cancer patients based on the previously associated stigmas attached the diagnoses and if this relationship is moderated by perceptions of neighborhood cohesion.

- **Hypothesis 1:** Due to prior research stating cervical cancer is stigmatized, I expect to find the effect of a cancer diagnosis on psychological distress is greater for women with cervical cancer than breast cancer.
- **Hypothesis 2:** I expect to find that neighborhood social cohesion moderates the relationship between type of cancer diagnosis and psychological distress.
CHAPTER III

METHODS

For this study, I use cross-sectional data from the 2013 National Health Interview Survey (NHIS) collected by the National Center for Health Statistics, which is a part of the Center for Disease Control and Prevention (CDC). The data, which are publically available, were obtained through ICPSR. The data from this survey are collected annually since 1957 and includes multilevel samples (household, family, person, sample adult, and sample child). The NHIS focuses on observing health behaviors and health statuses of individuals that are civilians who are not institutionalized within the United States. The 2013 data were collected by face-to-face interviews, telephone interviews, and computer-assisted personal interviews. The 2013 NHIS collected data from 41,335 households with 104,520 individuals in 42,321 families. The household level provides a limited amount of information, which consists of basic demographic questions about the individuals at the residence (n=104,520). The family level provides more descriptive information on the family at each residence, which includes variables associated with sociodemographic questions, health statuses, and access to health care services and insurance (n=104,520). The person level includes all individuals that were 18 and older in the household that were willing to participate in the study (n=104,520). Lastly, the sample adult level includes detailed information from one randomly selected individual from each household (n=34,557). For purposes of this project, I merged the household, family, person, and sample adult levels to obtain access to a variety of indicators of SES and neighborhood characteristics. My main independent, moderating, and dependent variables were taken from the adult level sample which
includes adults 18 years and older (n= 34,557). However, my analyses only include the cases that identified as having a previous breast or cervical cancer diagnosis (n= 775).

For the 2013 NHIS data, the response rate was 61.2% for the adult sample. Individuals that identified as Black, Hispanic, or Asian and aged 65 years or older were oversampled to provide a more accurate sample of those populations. The NHIS includes sample weights to adjust for the oversampling of these populations. The sample weights were included in the analyses which allows the sample estimates to be nationally representative. The NHIS obtained informed consent from all participants and de-identified the data. In order for the data to become publicly available, NHIS eliminated any identifying information for the individuals, families, and households. This study was reviewed and approved by Kent State University’s Institutional Review Board.

I use the NHIS data because it contains nationally representative samples, large sample sizes, and a variety of available variables across multi-levels. The data also allow me to analyze cancer types separately rather than studying cancer as a single entity. Further, the data have variables associated with neighborhood characteristics, such as home tenure status, length of time in residence, and perceptions of social cohesion—all of which are relevant to this study. Lastly, I chose to use the data from the year 2013, which is the most updated year of the survey that was available for public use on ICPSR.

Dependent Variable

The variables I use to create the distress variable are all items taken from the Kessler Psychological Distress Scale (K10) (Kessler et al. 2003). The NHIS uses an abridged version with only six of the factors (K6). The K10 and the K6 are commonly used in research as a global measurement of psychological distress and are considered a reliable and valid screening
measurement (Honda et al. 2005; Myer et al. 2008; Paradise et al. 2011; Keller et al. 2012; Rios et al. 2012; Costa et al. 2016). This generic mental distress scale was created to assess depression and anxiety symptoms on a continuum (Kessler et al. 2003). The continuum ranges from individuals who would not meet criteria for a specific disorder to individuals who would formally meet criteria for depressive/anxiety disorders (Myer et al. 2008). Additionally, the K10 and K6 use a 30-day reference assessment which has shown to better screen for depressive symptoms than the General Health Questionnaire 12 (GHQ-12), which uses the “past two weeks” as a reference period for screening (Furukawa et al. 2003). The K6 questionnaire includes six questions that ask the participants how often they felt the following emotions in the last 30 days: so sad that nothing could cheer you up, nervous, restless or fidgety, hopeless, that everything was an effort, or worthless. The responses available for these items were on a 5-point scale (1= All of the time, 2= Most of the time, 3= Some of the time, 4=A little of the time, 5= None of the time). I reverse coded the summed and averaged items so that a higher score on the K6 indicates higher levels of psychological distress. The Cronbach’s alpha score for the scale in this study is 0.87.

Independent Variable

The main independent variable, cancer type, has two categories for the analysis: “breast cancer” (coded as 0) and “cervical cancer” (coded as 1). In the NHIS questionnaire, participants were asked, “Have you ever been told by a doctor or other health professional that you had cancer or a malignancy of any kind?” For the participants that responded “Yes,” they were then asked to indicate what type of cancer it was by selecting an option from a broad list. For purposes of this project, I am only interested in those that indicated a previous breast cancer or cervical cancer diagnosis. There were a total of 584 individuals with breast cancer, 9 of which
were men. Because majority of breast cancer cases deal with women and because cervical cancer only concerns women, the breast cancer cases of men were eliminated from the analyses which results in a total of 575 women with breast cancer. For cervical cancer, there were a total of 200 women.

Moderating Variable

In order to operationalize perceived neighborhood social cohesion, I created a scale from four items measuring perceptions of mutual trust and support within the neighborhood to use as a possible mediator between cancer type and psychological distress. The NHIS asked participants or how much they disagreed or agreed on a 4-point scale (1= Definitely agree, 2= Somewhat agree, 3= Somewhat disagree, 4= Definitely disagree) with the following four statements: 1) “People in this neighborhood help each other out”; 2) “There are people I can count on in this neighborhood”; 3) “People in this neighborhood can be trusted”; 4) “This is a close-knit neighborhood.” I reverse coded these variables and made an aggregated sum so that high values reflect high neighborhood social cohesion, while low values indicate low cohesion. These same items have been used to measure neighborhood social cohesion in previous literature (Sampson et al. 1997; Kerrigan et al. 2006; Rios et al. 2012; Murillo et al. 2016). These studies have all reported consistent Cronbach’s alpha scores which indicate that this scale can reliably and validly measure social cohesion. Cronbach’s alpha for the scale in this study is 0.89.

Additionally, when I incorporate perceptions of neighborhood social cohesion in Model 2 and Model 3, I include two control variables for neighborhood characteristics. The NHIS questionnaire asked participants to choose what their housing tenure status was from three categories: Owned or being bought, renting, or other arrangements. I dichotomized this variable to include two categories: “Renting/other arrangement” (coded as 0) and “Own home” (coded as
1). I coded housing tenure in this way due to the significant effect that owning a house has on perceptions of neighborhood cohesion and psychological distress (Cairney & Boyle 2004; Ellaway et al. 2001). Not only is housing tenure status important for the analysis in this study, but length of time at residence is correlated with neighborhood social cohesion and psychological distress (Austin & Baba 1990; Schulz et al. 2006). In the NHIS questionnaire, the respondents were asked how long they have lived in their neighborhood. Responses fall into the following 5 categories: 1) “Less than 1 year;” 2) “1-3 years” 3) “4-10 years;” 4) “11-20 years;” and 5) “More than 20 years.”

Control Variables

I control for a variety of sociodemographic variables in my analyses. The NHIS survey used racial categories in accordance with the Office of Management and Budget’s (OMB) standards and include the following categories: “White,” “Black or African American,” “American Indian or Alaska Native,” “Asian,” “Race group not releasable,” and “Multiple races.” I recoded the variable to include two categories: “White” (coded as 0) and “Non-white” (coded as 1). I use these categories for race due to the differences between whites and non-whites for perceptions of social cohesion (Echeverria et al. 2008) and psychological distress (Williams et al. 2003). The NHIS questionnaire included marital status by asking participants “Are you now married, widowed, divorced, separated, never married, or living with a partner?” The responses included: “Married- Spouse in household, “Married- spouse not in household,” “Married- Spouse in household unknown,” “Widowed,” “Divorced,” “Separated,” “Never married,” and “Living with a partner.” I collapsed these categories into dichotomous responses to indicate if the respondent was not married/not living with their partner (coded as 0) or married/living with their partner (coded as 1). I chose to recode into these categories because
marriage and cohabitation, as a form of informal support, can impact perceptions of neighborhood social cohesion (Wen et al. 2006) and psychological distress (Williams et al. 2010). I additionally control for age (measured continuously in years), which is associated with perceptions of neighborhood social cohesion (Diez Roux and Mair 2010) and psychological distress (Mirowsky and Ross 2010). Lastly, health status can influence an individual’s mental health (Mirowsky and Ross 2010). I include the respondent’s reported health status which ranges from poor health (coded as 1) to excellent health (coded as 5).

In order to accurately assess the respondent’s SES, I use variables associated with income, education, and work status. At the family level, respondents are asked to give their total family income. The NHIS data contained a grouped version of this variable with four categories to differentiate income groups: “$0 - $34,999” (coded as 1), “$35,000 - $74,999” (coded as 2), “$75,000 - $99,999” (coded as 3), and “$100,000 and over” (coded as 4). In addition to income, I use education as an indicator of SES as a continuous measure. The NHIS questionnaire asked respondents to report their highest level of education completed. Respondents chose responses from “Never Attended/Kindergarten only” (coded as 0) to “Doctoral Degree” (coded as 21). For current work status, respondents were able to choose one of the following categories: “Working for pay at a job or business,” “With a job or business but not at work,” “Looking for work,” “Working, but not for pay, at a family-owned job or business,” and “Not working at a job or business and not looking for work.” For purposes of this current project, I dichotomized these responses into categories: “Not working” (coded as 0) and “Working” (coded as 1). I recoded this variable in this way because research has shown the negative impact that unemployment has on social integration and mental health (Bartley et al. 2006).
Analytical Strategy

For this study, I first calculated summary statistics using means and standard deviations for the total sample which includes all merged levels (Table 1). The observations differ based on the level at which the variable was measured. I then compare the means (or proportions) and standard deviations using t-tests and proportion tests for women with a previous diagnosis of breast cancer or cervical cancer for the dependent variable and independent variables (Table 1). I also provide a correlation matrix will all variables used in the analyses (Table 2). Next, shown in Table 3, I use Ordinary Least Squares (OLS) regression to investigate the effect of a specific cancer diagnosis on psychological distress (hypothesis 1). Model 1 shows the effect of cancer diagnosis on psychological distress while including demographic and SES variables. Model 2 assesses if controlling for neighborhood social cohesion and neighborhood characteristics impacts the effect of a cancer diagnosis on psychological distress. Model 3 includes the interaction term of a cancer diagnosis and perceptions of neighborhood social cohesion while controlling for sociodemographic and neighborhood characteristics (hypothesis 2). The interaction term will illustrate if the effect of a cancer diagnosis on psychological distress is moderated by perceptions of neighborhood social cohesion. Moderation occurs when the relationship between two variables changes depending on the value of a third, moderating variable (Baron and Kenny 1986; Hayes 2013). Further, the interpretation of the moderating effect will include that the difference between breast cancer and cervical cancer will vary based on the difference of the degree of social cohesion. Regression coefficients for Model 3 are shown in Table 3. All analyses were weighted and were completed using STATA 13.
CHAPTER IV

RESULTS

Bivariate Analyses

Table 1 shows the total sample with the mean and standard deviations of all variables in the study. Within the overall sample, the majority of people indicated that their race is white, are not married or living with a partner, have a job, and own a home. Additionally, the individuals in this sample are on average about 49 years old, have an income within the range of $35,00 to $75,000, report very good health, have completed about 13 years of education, and have lived at their residence with the range of 4 to 10 years.

I also performed t-tests (for continuous measures) and proportion tests (for categorical measures) to compare women with a previous diagnosis of either breast cancer or cervical cancer. Compared to the overall sample of the data, the women with a cervical or breast cancer diagnosis are less likely to be married or living with a partner, have lower income, higher education, be older in age, and not as likely to be working. There was no statistically significant difference between the two cancer diagnoses across race, health status, education, and whether they cohabit with a partner or not. However, women with a previous breast cancer diagnosis were more likely than women with cervical cancer to have a higher family income (1.9 versus 1.6, p < .05), own a home (.73 versus .55, p < .001), be older (67.74 versus 51.14, p < .001), not be working (.32 versus .53, p < .001), live longer at their residence (3.75 versus 3.05, p < .001), have higher perceptions of social cohesion (3.24 versus 2.88, p < .001), and have lower psychological distress (1.53 versus 1.84, p < .001). Additionally, the pattern of women with
Table 1. *Unweighted Descriptive Statistics*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total Sample</th>
<th>Breast Cancer (n = 575)</th>
<th>Cervical Cancer (n = 200)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Living with Partner (1= Married/Living with Partner)</td>
<td>34465</td>
<td>0.472</td>
<td>0.499</td>
</tr>
<tr>
<td>Income</td>
<td>95119</td>
<td>2.187</td>
<td>1.130</td>
</tr>
<tr>
<td>Housing Tenure Status (1=Own Home)</td>
<td>102941</td>
<td>0.619</td>
<td>0.486</td>
</tr>
<tr>
<td>Race (1=Non-white)</td>
<td>34557</td>
<td>0.249</td>
<td>0.433</td>
</tr>
<tr>
<td>Health</td>
<td>104385</td>
<td>3.874</td>
<td>1.061</td>
</tr>
<tr>
<td>Age</td>
<td>34557</td>
<td>48.697</td>
<td>18.210</td>
</tr>
<tr>
<td>Work Status (1=Working)</td>
<td>34495</td>
<td>0.645</td>
<td>0.478</td>
</tr>
<tr>
<td>Length of time at Residence</td>
<td>33689</td>
<td>3.086</td>
<td>1.345</td>
</tr>
<tr>
<td>Distress</td>
<td>33402</td>
<td>1.467</td>
<td>0.699</td>
</tr>
<tr>
<td>Neighborhood Social Cohesion</td>
<td>33159</td>
<td>3.039</td>
<td>0.834</td>
</tr>
</tbody>
</table>

*p < .05 **p < .001
Data Source: CDC/NCHS, National Health Interview Survey, 2013
breast cancer being older can lead to an understanding that they are less likely to be working due to retirement. Table 2 presents correlations among all variables in the analyses. Almost all variables are significantly correlated with each other. I assessed multicollinearity with the variance inflation factor and found that none of the variables are highly correlated enough to cause problems in the analyses.

Relationship between Cancer Diagnosis and Psychological Distress

When controlling for demographic characteristics such as income, age, race, living with a partner/marital status, health status, education, and work status, the effect of a cancer diagnosis on psychological distress is statistically significant. Women that indicated they had a previous diagnosis of cervical cancer reported a .142 unit increase in psychological distress. This finding supports my first hypothesis stating that the effect of a cancer diagnosis on psychological distress is higher for women with cervical cancer than women with breast cancer. Looking further at Table 3, the coefficients of income, age, and health status are also statistically significant. An increase in income predicts a decrease in psychological distress by -.08 units. Additionally, an increase in age predicts a decrease in psychological distress by -.008. Lastly, with each unit increase in health status, this model predicts a decrease of -.26 units in psychological distress. The r-squared of this model is .25. This means that this model accounts for approximately 25% of the variance in psychological distress.

In the second column in Table 3, I present the unstandardized regression coefficients for Model 2 which controls for neighborhood social cohesion, length of time at residence, and housing tenure status. After controlling for these three variables, the coefficient for cancer decreased and became insignificant. Within this model, neighborhood social cohesion, income,
Table 2. Correlations among Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cancer</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Neighborhood Social Cohesion</td>
<td>0.1704*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Psychological Distress</td>
<td>-0.1900*</td>
<td>-0.1568*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Living with Partner</td>
<td>0.0125</td>
<td>-0.1005*</td>
<td>0.0993*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Household Income</td>
<td>-0.0998*</td>
<td>-0.1815*</td>
<td>0.1783*</td>
<td>0.4027*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. House Tenure</td>
<td>-0.1698*</td>
<td>-0.1233*</td>
<td>0.2541*</td>
<td>0.2644*</td>
<td>0.4166*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Length of Time at Residence</td>
<td>-0.2334*</td>
<td>-0.0578*</td>
<td>0.1841*</td>
<td>0.0833*</td>
<td>0.1125*</td>
<td>0.4989*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Age</td>
<td>-0.4706*</td>
<td>-0.0326*</td>
<td>0.1811*</td>
<td>0.009</td>
<td>-0.0321*</td>
<td>0.3154*</td>
<td>0.5154*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Race</td>
<td>-0.0021</td>
<td>-0.0061</td>
<td>-0.1127*</td>
<td>-0.1224*</td>
<td>-0.1112*</td>
<td>-0.1759*</td>
<td>-0.0761*</td>
<td>-0.0744*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Health Status</td>
<td>-0.0045</td>
<td>-0.3306*</td>
<td>0.1024*</td>
<td>0.0794*</td>
<td>0.2425*</td>
<td>0.0412*</td>
<td>-0.1158*</td>
<td>-0.2782*</td>
<td>-0.0587*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Education</td>
<td>-0.0068</td>
<td>-0.1184*</td>
<td>0.1076*</td>
<td>0.0740*</td>
<td>0.2067*</td>
<td>0.1343*</td>
<td>-0.0370*</td>
<td>-0.0974*</td>
<td>-0.0159*</td>
<td>-0.0456*</td>
<td>1</td>
<td></td>
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<tr>
<td>12. Work Status</td>
<td>0.1924*</td>
<td>-0.1267*</td>
<td>-0.0299*</td>
<td>0.0781*</td>
<td>0.2614*</td>
<td>-0.0449*</td>
<td>-0.2064*</td>
<td>-0.4561*</td>
<td>-0.0185*</td>
<td>0.3235*</td>
<td>0.2318*</td>
<td>1</td>
</tr>
</tbody>
</table>

*p<.05
Table 3. *Ordinary Least Squares Regression Results*

<table>
<thead>
<tr>
<th></th>
<th>Psychological Distress</th>
<th>Model 1&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Model 2&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Model 3&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer (1=Cervical Cancer)</td>
<td>0.142*</td>
<td>0.113</td>
<td>0.523*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.066)</td>
<td>(0.067)</td>
<td>(0.215)</td>
<td></td>
</tr>
<tr>
<td>Neighborhood Social Cohesion</td>
<td>-</td>
<td>-0.101**</td>
<td>-0.055</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
<td>(0.040)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer x Neighborhood Social Cohesion</td>
<td>-</td>
<td>-</td>
<td>-0.133*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.066)</td>
<td></td>
</tr>
<tr>
<td>Length of Time at Residence</td>
<td>-</td>
<td>0.029</td>
<td>0.030</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.024)</td>
<td>(0.025)</td>
<td></td>
</tr>
<tr>
<td>House Tenure Status (1=Own Home)</td>
<td>-</td>
<td>-0.084</td>
<td>-0.080</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.071)</td>
<td>(0.071)</td>
<td></td>
</tr>
<tr>
<td><strong>Sociodemographic Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>-0.086**</td>
<td>-0.075*</td>
<td>-0.074*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.030)</td>
<td>(0.030)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.009***</td>
<td>-0.008**</td>
<td>-0.007**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td></td>
</tr>
<tr>
<td>Race (1=Non-white)</td>
<td>-0.116</td>
<td>-0.139</td>
<td>-0.126</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.087)</td>
<td>(0.087)</td>
<td>(0.087)</td>
<td></td>
</tr>
<tr>
<td>Living with Partner (1=Married/LwP)</td>
<td>-0.073</td>
<td>-0.042</td>
<td>-0.046</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.058)</td>
<td>(0.061)</td>
<td>(0.061)</td>
<td></td>
</tr>
<tr>
<td>Health Status</td>
<td>-0.261***</td>
<td>-0.244***</td>
<td>-0.241***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.045)</td>
<td>(0.025)</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-0.011</td>
<td>-0.012</td>
<td>-0.010</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.009)</td>
<td>(0.009)</td>
<td></td>
</tr>
<tr>
<td>Work Status (1=Working)</td>
<td>-0.058</td>
<td>-0.076</td>
<td>-0.078</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.061)</td>
<td>(0.061)</td>
<td>(0.061)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.344***</td>
<td>3.501***</td>
<td>3.286***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.211)</td>
<td>(0.223)</td>
<td>(0.247)</td>
<td></td>
</tr>
<tr>
<td>R-Square</td>
<td>0.247</td>
<td>0.253</td>
<td>0.257</td>
<td></td>
</tr>
</tbody>
</table>
age, and health status are statistically significant. For each unit increase in perceptions of neighborhood social cohesion, psychological distress decreased by .101 units. As an individual perceives their neighborhood to be more socially cohesive, their psychological distress decreases. Further, as income increases, psychological distress decreases by .075 units. Likewise, an increase in age predicts a .008-unit decrease in psychological distress. Lastly, with each unit increase in health status, psychological distress decreases by .244 units. The r-squared for this model is .25. This means that this model accounts for 25% of the variance in psychological distress. Although the r-squared changed minimally from Model 1 to Model 2 (.2472 to .2527), this change was significant, meaning that adding the neighborhood variables significantly add to the explained variance (F (3, 684) = 4.10, p < .01).

When neighborhood social cohesion and neighborhood characteristics were added in the regression model, the cancer variable was no longer statistically significant. Although not a complete mediation analyses, and given that cancer diagnosis become significant again in Model 3, I argue that this demonstrates further, along with the theoretical justification for using moderation, that perceptions of neighborhood social cohesion are better thought of as a moderator.

Model 3 shows the unstandardized regression coefficients for the independent variables, the controls, and the interaction term for cancer and neighborhood social cohesion. Based on the significance of the interaction term, the relationship between cancer diagnosis and psychological distress varies based on the degree of neighborhood social cohesion. For women with cervical cancer, each one-unit increase in neighborhood social cohesion is correlated with a .188 unit decrease in psychological distress ($b = -0.133 - 0.055$, $p < .05$). Compared to women with breast cancer, women with cervical cancer report .523 units increase in psychological distress when all
other variables are kept constant. However, when women with cervical cancer have a one-unit increase in perceptions of neighborhood social cohesion, the comparison to breast cancer changes to .39 units. This finding suggests that neighborhood social support moderates the relationship between cancer diagnosis and distress. In highly cohesive neighborhoods, women with cervical cancer experience an associated psychological benefit while women with breast cancer do not.

Similar to Models 1 and 2, the variables income, age, and health status are statistically significant. With each unit increase in income, psychological distress decreases by .074 units. As age increases, there is a decrease in psychological distress by .007 units. Lastly, with each unit increase in health status, psychological distress decreases by .241 units. The r-squared for this model changes minimally from Model 2 (.253 to .257). After performing an F-test in order to compare models, I find that the r-squared change from Model 2 to Model 3 is significant after adding the interaction term (F (1, 684) = 4.02, p < .05). A visual representation of the interaction is shown in Figure 1. This figure illustrates that women with cervical cancer show an association of decreased psychological distress with higher neighborhood social cohesion. In contrast, psychological distress for breast cancer does not depend on different levels of neighborhood social cohesion.
Figure 1. Psychological distress: Interaction between cancer diagnosis and perceptions of neighborhood social cohesion.
CHAPTER V
DISCUSSION

Drawing on the stress process model, I explore the effects of a chronic stressor on mental health and the way in which social support mitigates this relationship (Pearlin et al. 1981). Specifically, I investigate the effect of more or less stigmatized cancer diagnoses on mental health. I also examine the moderating effect of community supportiveness on the relationship between cancer and distress. After controlling for sociodemographic and neighborhood characteristics, my study presents two findings that illustrate the importance of understanding the etiology of cancers and the effects of community connectedness on mental health. First, I find that women with cervical cancer express greater psychological distress than women with breast cancer. Additionally, I find that for women with cervical cancer, perceptions of highly cohesive neighborhoods influence the level of distress.

Prior research exploring cancer as a chronic stressor leading to mental health outcomes has typically focused on cancer as a single entity (Lebel and Devins 2008). However, some research has further investigated this relationship by comparing etiologically different cancer diagnoses and the detrimental effects on mental health—although these primarily focused on comparing breast cancer to lung cancer (Ell et al. 2008; Else-Quest et al. 2008; Gulyn and Youssef 2010; Bell 2014). Similar to lung cancer, in that individual behavior is overwhelmingly the cause of disease, cervical cancer is often linked to stigma, discrimination from others, and the internalization of shame and blame (Else-Quest and Jackson 2014). In contrast, breast cancer is supported by the public with sympathy, funds for research, and an abundance of community
support (Bell 2014). Based on previous research finding differences between these two cancers on etiology (ACS 2017), internalization of stigma (Lebel and Devins 2008), and perceptions from others (Dyer 2010; Bell 2014), I hypothesized that women with cervical cancer would have greater psychological distress than women with breast cancer. Although this hypothesis was supported, the findings need to be interpreted with caution given the lack of measures of perceived or internalized stigma.

Since cervical cancer almost always results from the contraction of HPV, women with this disease often internalize feelings of shame and self-blame and also may experience discrimination when telling others about their cancer (Dyer 2010; Shepherd and Gerend 2013; Blake et al. 2015). Because others may view HPV as linked to sexual promiscuity, they may view women with cervical cancer as having a preventable or self-earned disease (Else-Quest and Jackson 2014). In contrast, women with breast cancer are not typically seen as having a preventable disease, even though it is most often brought on by poor health behaviors such as obesity, smoking, or alcohol (Bell 2014; ACS 2017). These differences in internalization of stigma and discrimination or sympathy received from others may be what lies in the difference between individual mental health outcomes across these two cancer diagnoses. My finding that these two cancer groups differ in distress is consistent with literature comparing lung cancer and breast cancer in which individuals with lung cancer experience more distress (Wassenaar et al. 2007; LoConte et al. 2008; Else-Quest et al. 2009; Sriram et al. 2015; Zabora et al. 2015).

Prior literature involving the stress process model contends that the effects of a chronic stressor on mental health might be buffered in the presence of social support (Wheaton 1985; Aneshensel 2009). The findings of this study suggest that this is true specifically for women with cervical cancer. Women with cervical cancer when perceiving their neighborhood as
unsupportive, have significantly higher levels of psychological distress than women with breast cancer. This suggests that when perceiving themselves to be socially isolated and unconnected with their community, these women typically have higher levels of distress. However, when perceiving their neighborhoods as highly cohesive, women with cervical cancer express lower levels of psychological distress. Thus, when given a high amount of social support in their community, women with cervical cancer benefit in that their distress is lower than it is for those that perceive low cohesion in their neighborhood.

For women with breast cancer, perceptions of neighborhood social cohesion were not a significant factor. Women with breast cancer at low cohesive perceptions of their neighborhood, showed lower levels of psychological distress than women with cervical cancer. Furthermore, when perceiving their neighborhoods as highly cohesive, women with breast cancer still fare better than women with cervical cancer in terms of level of psychological distress, although the change from low cohesion to high cohesion is negligible. This finding suggests that the support within a community does not benefit women with breast cancer to the same extent that it does for women with cervical cancer. Within highly cohesive neighborhoods, the mental health disparity between these two groups of women is essentially narrowed. Consistent with previous literature, this might be due to the fact that women with breast cancer have been shown to primarily rely on informal support from family and friends (Bloom 1992), likely because they feel more comfortable reaching out for support.

The intent of the present study was not necessarily to find ways to improve mental health outcomes for all individuals with cancer, but instead, to focus on groups that may be disadvantaged even further because of their type of cancer. The results of this study showcase the way in which the support of a community can narrow the gap in mental health disparities.
between these two cancer types: one cancer type which signifies the bulk of public awareness of cancer and obtains large amounts of monetary and emotional support compared with one cancer type that symbolizes cancers seen as preventable and self-earned.

The results from this study could potentially have important implications for policy. For example, the findings demonstrate that perceived support and connectedness in the community and neighborhood can mitigate psychological distress, specifically for those that are stigmatized or discriminated against. Instead of addressing mental health outcomes from individual to individual, policy makers can focus on meso-level components, such as neighborhoods, to focus on employing interventions (Link and Phelan 1995; Aneshensel 2009; Wheaton et al. 2013). Link and Phelan (1995) argued that health policy makers should focus on proposing interventions aimed to benefit groups of people instead of tailoring help towards singular individuals. As they find that structural factors are fundamental causes of disease, interventions thus should target structural factors (Link and Phelan 1995). Link and Phelan (1995) also posited that if health policy makers create interventions for multiple diseases, rather than just one disease, more people will stand to benefit. For example, creating interventions for those with cervical or lung cancer, who are stigmatized for having a preventable cancer, more people will be reached and helped. By employing interventions for social support at the neighborhood level, groups of individuals disadvantaged by stigma and discrimination can be influenced and given the social support that is needed to help reduce psychological distress. Scholars have previously identified effective interventions that target those that might feel detached from the community (Van Gundy et al. 2011). Interventions that increase interaction among residents can potentially reach a variety of individuals to increase their degree of interconnectedness in their neighborhood (Eldredge et al. 2016).
Limitations and Future Directions

The study’s findings should be considered in light of several limitations. First, I am relying on self-reported measurements for the variables in the analyses which leaves the possibility that responses are biased. However, the NHIS contains reliable and valid measures of the key variables in this study (Kessler et al. 2003; Sampson et al. 1997). As a second limitation, the NHIS data do not include any descriptive information of the neighborhood area. Therefore, I was unable to include specific characteristics of the neighborhoods (i.e., suburban, urban, or rural), which research shows that results in variability of perceptions of social cohesion (Van Gundy et al. 2011). Adams (1992) studied the effect of urban or suburban neighborhood on feelings of self-efficacy, satisfaction with their neighborhood, and satisfaction with their quality of life. He found that individuals living in suburban neighborhoods were no more likely to feel more satisfied with their quality of life and the area they lived. Additionally, those from the suburban neighborhoods were not found to have stronger feelings of self-efficacy. Due to differences in characteristics of neighborhoods, future research should untangle suburban, rural, and urban neighborhoods to interpret if these characteristics influence cohesion differently. Furthermore, future research should also explore other neighborhood characteristics such as perceptions of neighborhood disorder, neighborhood SES, and type of neighborhood, such as rural, suburban, or urban and its ability to influence individual’s adaptation to cancer diagnoses. Adding descriptive components about neighborhoods could add objective data about neighborhood characteristics (Gomez et al. 2015). For those in lower class neighborhoods, research shows that neighbors and other individuals outside of the family influence mental health outcomes as important forms of social support (Mesch and Manor 1998; Ross and Jang 2000).
With this in mind, future research should examine the way in which neighborhood SES, along with individual SES, impacts perceptions of social cohesion for those with cancer.

In addition to lacking descriptions for neighborhoods, this project lacks the direct measure of feelings and perceptions of stigmatization of a cancer diagnosis. By using prior literature that studied the feelings of a breast or cervical cancer diagnosis and survivorship, I am inferring the difference in internalization and experience of stigma based on the specific cancer type. This current project is also limited in that there is no measurement for the stage of cancer when it was diagnosed. It is widely known from previous literature that psychological distress differs based on the progression and prognosis of cancer (Brown et al. 2003; Deimling et al. 2006). Similarly, patients may require different amounts of social support based on the stage of cancer (Faller et al. 2017). Therefore, the overall moderation of social cohesion may differ for those with cancer that has metastasized than for those whose cancer is localized. Next, as indicated in prior research, some individuals might be selected into or out of specific neighborhoods due to their health status (Diez Roux and Mair 2010). Additionally, concerning the neighborhood concept, neighborhood is not clearly defined in the survey, so I am unable to know if individuals interpret neighborhood as strictly their spatial contexts or if they include community groups. Lastly, the NHIS is an annual, cross-sectional survey, which lacks a longitudinal component that would be interesting and crucial to add into this project. With only cross-sectional data, I lack the ability to make a causal argument; however, the addition of longitudinal data would allow me to address the sequence of the variables in my conceptual model (George 1999). Moreover, with longitudinal data I could explore a life course perspective to examine if an individual’s perceptions of neighborhood social cohesion and psychological
distress change over time: from onset of the illness to later in life. This is a potential area for future research.

Conclusion

Stigma, neighborhood social cohesion, and psychological distress have all been studied separately in prior research; however, the proposed research takes a unique approach to these concepts. My hypothesis, that psychological distress will differ based on the cancer diagnosis, was supported. This hypothesis is based on previous literature that has focused on cervical cancer being negatively stigmatized as linked to sexual promiscuity while breast cancer is viewed as a blameless, less stigmatized cancer. My results suggest that women with cervical cancer express higher levels of psychological distress. Additionally, my hypothesis that community cohesion moderates the relationship between a type of cancer diagnosis and psychological distress was supported, indicating the importance of community support.

Social support is recognized in previous literature as being beneficial for survival from cancer (Helgeson and Cohen 1996; Sammarco 2001; Glaser and Glassman 2014; Morse et al. 2014), although specific types of cancers may need specialized forms of support to assist with coping and stress (Ell et al. 1989; Ell et al. 1992; Blanchard et al. 1995). The well-known campaigns for breast cancer research and support are increasing awareness of the risks associated with breast cancer, as well as emphasizing the importance of preventative care and specialized support systems (Maxwell 2015). However, organizations formed for cancers such as cervical cancer have yet to reach the same levels of public awareness in improving psychological well-being and increasing social support (Else-Quest and Jackson 2014). In the instances when interventions are put forth to help cancers with this specific, preventable stigma, the attempts are made for increasing awareness that HPV causes cancer rather than emphasizing care for those
currently with cervical cancer (Dyer 2010). Social connectedness has been shown to have powerful effects on mental health (Yamasaki et al. 2017). Specifically, when a stigmatized individual feels supported and interconnected with others, feelings of distress are buffered (Palmer et al. 2011). Conversely, if a stigmatized individual is lacking feelings of social support within their community, their mental health could be negatively affected. The findings of this study highlight the importance of implementing policies that target specific cancers that may be stigmatized as preventable, thus resulting in these groups being more vulnerable to greater psychological distress than cancers that are less stigmatized.
REFERENCES


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