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Disparity of Breast Cancer Survival in African American Women vs. Caucasians: Examination of Potential Origins

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**DISPARITY OF BREAST CANCER SURVIVAL IN AFRICAN AMERICAN
WOMEN VS. CAUCASIANS: EXAMINATION OF POTENTIAL ORIGINS**

by
Mary Collier

A THESIS

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CHAPTER ONE

INTRODUCTION

Background and Significance

Breast cancer remains the most commonly diagnosed cancer in women of all racial groups (Joslyn & West, 2000). In the United States, 30 % of all cancers diagnosed are breast cancer; the mortality is second only to lung cancer in women (16% vs 25% respectively) (Joslyn & West, 2000). According to the American Cancer Society (2003), the overall incidence of breast cancer has increased since 1980. Interestingly, between 1992 and 2000, the incidence rate for Caucasians has increased at a rate of 0.9% per year, and the rates among African American women has stabilized (American Cancer Society, 2003). Despite the overall rise in breast cancer incidences, the mortality rate declined from 1992 to 2000. The decline for Caucasians was at a rate of 2.6% per year and the rate of mortality decline for African Americans was 1.1%. The disparity in breast cancer mortality between African American and Caucasian women began to widen in the 1980s, and in 2000, there has been over 30% excess deaths among African Americans compared to Caucasians (American Cancer Society, 2003). African American women have the highest mortality from breast cancer than any other racial group, even though Caucasians have a higher incidence. The National Cancer Institute (2002) reported for years 1996-2000, the breast cancer incidence per year per 100,000 females in African American women compared to Caucasians was 121.7 versus 140.8. The mortality rate was 35.9 for African Americans compared to 27.2 for Caucasians.

According to the existing data, there are serious gaps in breast cancer survival between African American women and Caucasians that warrant further research. The

disparity cannot be ignored by the nursing profession. Nurses must be aware of critical health trends that exist in the population. If nurses are aware of the disparity, interventions can be designed to address the problem through education and potential treatment alterations based upon race.

Problem Statement

The problem that exists is that research consistently demonstrates that African American women have higher breast cancer mortality rates than Caucasian women. To date, despite the substantial number of studies that have focused on this problem, the origin of the disparity has not been identified.

Purpose of Study

The purpose of this study is to assess if the mortality disparity between African American and Caucasian women diagnosed with breast cancer exist in our sample and if present, then further explore how survival is impacted by potential contributing variables to the mortality difference.

Research Questions

1. Is there a mortality disparity between African American and Caucasian women diagnosed with breast cancer in our sample?
2. If the disparity exists, is the difference in survival related socioeconomic status, age, stage at presentation or presenting pathological features of the tumors at diagnosis?

Framework

Neuman's System Model is the theory of framework chosen for this study.

Neuman considers an individual as an open system that interacts with the environment, and at the core of the individuals is a basic structure. The basic structure includes factors common to all organisms necessary for survival such as temperature range, response pattern, genetic structure and organ strength (Neuman, 1995, p. 27). This basic structure includes physiologic, psychological, sociocultural, developmental and spiritual variables. Outside of the basic structure are the lines of resistance, these concentric lines represent the internal factors of an individual that help defend against stressors and protect the basic structure. Encircling the line of resistance is the normal line of defense, this is the individual's usual state of well being; this line develops over time and is a representation of internal and external factors and adaptation (Reed, 1993, p. 8). Finally, there is the flexible line of defense, which is a concentric line representative of a protective barrier that prevents stressors from breaking through to the normal line of defense; this circle is dynamic and can change quickly over time (Neuman, 1995, p.27). Over time, the structure of an individual is bombarded by stressors, which is any environmental force that alters the systems stability; this can be intrapersonal, interpersonal, or extrapersonal. The degree of reaction is the amount of system instability that occurs after exposure to a stressor (Webb, 1995). The instability that occurs is affected by the strength of the stressor, the individuals ability to defend itself, and by outside sources such as nurses who help to lessen the impact of the stressor by primary, secondary or tertiary prevention.

Neuman's System Model describes the individual as a unique open system, interaction with the environment, responding to stressors and adapting either through their own resources or by the aid of external sources. Likewise, understanding and identifying the origin of the disparity in survival between African American and Caucasian women necessitates viewing the African American women as a distinct individual, interacting with the environment, and coping with both external and internal stressors.

Viewing the African American women as a dynamic composite of interrelationships between physiological, psychological, sociocultural, developmental and spiritual factors helps to understand the uniqueness of each individual (Freese, 2002). In addition to gaining insight on the distinctive nature of the women, it is also essential to understand their internal and external make up. This includes the basic structure, specifically genetic framework, are African American women more prone to developing biologically more aggressive breast cancers than Caucasian women?

Socioeconomic status also may play a role in the instability of the core structure of African American women compared with Caucasian in terms of breast cancer mortality. Due to a number of external factors, African American women have had higher levels of poverty than Caucasians. In 1997, the U.S. Bureau reported a higher number of black living in poverty than whites, 26.5% and 11% respectively (Bauquet and Commisky, 1999). Therefore, many African American women are left with weaker flexible lines of defense due to poor economic resources. Poor economic resources weaken the normal and flexible line of defense in many ways;

internal stress affects the body physiologically manifested by hypertension or decreased immunity. Also, the lack of financial resources influences an individual's ability to seek health care for wellness visits and when there is an acute or chronic health condition. Low economic resources also affect the intensity of stressors attacking the African American women, due to the high level of anxiety and obstacles commonly associated with low income.

Methods of prevention including mammograms, breast self exams and clinical exams are all means of reacting to either a potential or actual stressor of breast cancer. The three levels of prevention, primary, secondary, and tertiary are influenced by internal and environmental factors. Internally, the African American women's willingness to participate in all three levels of prevention impact the likelihood of survival from breast cancer. Likewise, the external environment, including the healthcare system, impacts the African Americans participation in preventive activities through providing education, care and healthcare access.

Definitions of Terms and Concepts

Conceptual and Operational Definitions

Staging.

Breast cancer is staged using a TNM classification system. The stages range from Stage I to IV (Stage II has subsets A and B), and are based upon size of primary tumor (T), involvement of axillary lymph nodes lateral to the affected breast (N), and the presence or absence of metastasis to distant organs or nodes other than the lateral axillary nodes. Stages are directly related to prognosis and treatment, with I having the best prognosis and IV having the poorest (Dollinger, Mulvihill, Rosenbaum, & Tempero, 2002).

Hormone sensitivity.

This is the measurement of protein receptors for estrogen and progesterone in breast cancer tissue. The tumor content of these receptors, negative or positive, correlates with prognosis and response to hormonal therapy. Thus, women with hormone positive tumors will have a reduced risk of recurrence with the use of hormonal therapy; women with hormone receptor positive tumors typically have better outcomes particularly if they are pre-menopausal (Dollinger et al., 2002).

Access to care.

Defined as an individual's ability to attain medical care in terms of availability of care, transportation, or in relation to economic factors (Bibb, 2001). For the purpose of this study, socioeconomic factors are defined as relating to or concerned with the interaction of social and economic factors (Grace, A. 2002). This includes demographic characteristics such as age, race, and income. The income is based upon the average household income in the zip code where the subject resides.

The demographic data, tumor stage, and hormone receptor status is measured based on the data in the Tumor Registry at a medium sized indigent hospital in the southeast. Access to care cannot be quantitatively measured, but all patients at this hospital are eligible for access to care regardless of health insurance coverage or ability to pay. In addition, all patients are provided with free transportation by the medical center to and from the facility for medical appointments, test and treatments. Therefore, all patients who choose to receive care at this facility have no access barriers in terms of economic status, availability of care, or transportation.

Major Assumptions

An assumption of this study is that all individuals in the medium sized city in the southeast realize the availability of medical care at the medical facility regardless of economic status. An additional assumption is that information in the tumor registry was gathered and transferred correctly.

Major Limitations

A limitation of the study is that the results cannot be generalized to findings in tumor registries in private hospitals, private and indigent hospitals typically differ dramatically in the average demographics of the population served, including income and race. Another limitation of the study is that the subjects' preventive screening is not measured. Thus, there is no information provided as to whether the subjects performed breast self exams regularly, or had regular mammograms of clinical breast exams. Another limitation is that the economic status is not based upon individuals' yearly income, rather on inferences from average income in the zip code where they reside.

Significance of the Study

Further research into the breast cancer survival disparity between African American and Caucasian women will provide nurses with a better understanding of ways to intervene and begin to eliminate the disparity if it exist. If the reason for the difference in survival is better understood by nurses, then interventions can be modified to address the issue. For example, if research proves that African American women have biologically more aggressive tumors than Caucasian, then nursing interventions should focus around earlier detection and modifying treatment plans to

be more specific to the tumor characteristics by race. If the reason for the distinction between African Americans and Caucasian women is socioeconomic, then nurses should begin to plan interventions around improving access to care, both preventive and treatment oriented. If there proves to be no difference in survival, further research should be done to assess the survival outcomes throughout the United States, to explore the role of indigent hospitals in our healthcare system.

Summary

Since 1992, the breast cancer incidence rate for Caucasians has steadily risen, while the incidence for African American women has stabilized. Despite the overall leveling of breast cancer incidence, the five year survival rate is significantly lower for African Americans compared with Caucasians. From 1992 to 1999, the five year survival for African Americans was 74% compared with 88% for Caucasians (Jemel et al., 2004). To date, no definitive reason for decreased survival for African American women has been identified, possible influences that have been suggested include genetically more aggressive tumors in African Americans, difference in socioeconomic status, barriers to healthcare access, and/or reduced utilization of preventive tools. By exploring the potential influencing factors that possibly contribute to the higher mortality in African American women there will be increased knowledge in this arena, encouraging nurses and other health care workers to formulate specific methods to aid in the endeavors to decrease African American mortality from breast cancer.

CHAPTER 2 REVIEW OF LITERATURE

The purpose of this review was to focus on literature discussing the potential causes for the survival disparity in African American women and Caucasian women involving four concepts: tumor pathology, socioeconomic status, access to care and utilization of screening tools. There has been much research on this topic, this study limits scope of the studies and literature reviewed to 1998 through current. The disparity in survival between the two races has been consistently confirmed in the literature, and the cause has been narrowed primarily to the four concepts discussed in this review. Although, the majority of studies reviewed focus on one or two potential causes for mortality difference, no studies were found that focused on several influencing factors concomitantly. Typically, the researcher was able to confirm the correlation between the explored factor and the mortality, but no study to date can definitely identify the specific cause/causes.

Internet resources used to acquire information were Medline and CINAHL in the McKee Library database at Southern Adventist University and Erlanger Medical Center Library. Keywords used were “African American breast cancer survival”, “African American breast cancer socioeconomic”, “African American mammogram” and “African American breast cancer access to care”.

Differences in Tumor Pathology

The biological pathogenesis of breast cancer is complex. In breast cancer there is an alteration in the DNA of the breast tissue. Several genes linked with tumor development. The role of the p53 gene is to stop uncontrolled cell reproduction. If there is a defect in the p53 gene, defective cells can proliferate and

grow into large, aggressive tumors. Other tumor related genes include the presence of a familial mutated gene called BRCA1 and the HER2 gene. The HER2 gene is amplified in approximately 25% of breast tumors; HER2 signals growth to the nucleus and is associated with a poor prognosis (Huether & McCance, 2002). The Bcl-2 gene is a proto-oncogene that acts to suppress or stop apoptosis (cell death) and in turn promotes breast cancer due to rapid proliferation of cells (Huether & McCance, 2002).

Hormones, specifically estrogen and progesterone are growth factors for many breast tumors. Approximately one third of breast cancers are dependent on progesterone and/or estrogen for their growth. Cancers that lack hormone receptors are associated with poor prognosis, particularly in pre-menopausal women (Huether & McCance, 2002).

The staging of breast cancer is based upon three variables, tumor size, lymph node involvement and distant metastasis; this is also called TNM staging. There are five stages based upon the extent of the variables, Stage 0 has the best prognosis with Stage IV having very poor prognosis. Treatment choices are based upon the tumor stage and hormone receptor status (Huether & McCance, 2002).

Hunter (2000) explored the tumor biology characteristics of African American compared with Caucasian women. The review of literature included various studies relating to the pathological difference in tumor types of each race. Hunter (2003) explained that it is “Well established the breast carcinoma in African American women is biologically more aggressive, with poorly differentiated tumors, high grade nuclear atypia and less estrogen receptor positivity” (p. 2000). Chen et al. (1994), (as cited in Hunter, 2000) examined the histological characteristics of 963

African American women, adjusting for age, stage, geographic location; their tumors had higher grade nuclear atypia, higher mitotic activity, and more tumor necrosis than Caucasians. Hunter also examines literature regarding the NCI Black/White Cancer Survival Study; a comparison of p53 gene alterations in 45 African American and 47 Caucasian patients. Results of the study showed that African Americans who possessed the gene alteration had a four to five excess risk of death from their breast cancer than those who did not have the alteration. Alternately, Caucasian's who had p53 gene alteration did not carry the same risk of death. African Americans also had higher S-phase fraction than Caucasians. Hunter (2000) also reviewed two additional studies that showed no difference in cellular biology between African Americans and Caucasians. Suggestions were made for further research into this area and its relationship to breast cancer survival.

Brinker, Covington, Hall, Kotwall, & Maxwell (2003) explored prognostic factors in early stage (I and II) breast cancer for African American women compared with Caucasian. The objective was to distinguish any prognostic factors in early stage breast cancer that differed among race. By limiting the study to early stage tumors, the focus was placed solely on the biologic features of tumors in African American and Caucasian women and their prognosis.

The sample was women presenting to a large regional referral medical center in southeastern North Carolina from 1990-1999. Medical records of 910 women with early stage breast cancer were reviewed. There were 153 tumors in 150 African American women and 773 tumors in 760 Caucasian women analyzed. Pathology reports were reviewed by a surgeon. Cases were excluded if they met any of the following criteria: ductal carcinoma in situ, lobular carcinoma in situ, unknown

tumor size, tumor >39 mm, multicentric disease, Paget's disease, stage III or IV disease or local recurrence.

Prognostic factors were analyzed included the following: patient age (>50 or <50 years old), histology (ductal or lobular), tumor size (<20mm or >20mm), tumor palpability, high proliferation indices, tumor grade, estrogen and progesterone receptor status, tumor lymphatic/ vascular invasion, and nodal status (Brinker et al., 2003). Analysis of the data was done using Chi-square to test for differences in the distribution, $P < 0.05$ was considered statistically significant. SAS software was used to determine relative risk (RR) and 95% confidence interval (CI) for each of the variables (Brinker et al., 2003).

The average age of the patients was 59.3 years for black women and 62.4 for white ($P=0.02$). Black women had more negative prognostic factors than white women across the board. Black women were significantly more likely to be less than 50 years of age (RR = 1.8), present with palpable disease (RR = 1.3), poorly differentiated tumors (RR = 1.5), have ER-negative tumors (RR = 1.7), have PR negative tumors (RR = 1.4), have higher proliferation indices (RR = 1.9), and have node positive disease (RR = 1.6) (Brinker et al., 2003). The five year survival rate for black women was not surprisingly lower for blacks than for whites (86.4% vs., 93.5%). The log-rank test comparing survival curves produced a statistic of 3.959 and was compared with chi square distribution at $\alpha = 0.05$ [$X^2(1) = 3.841$]. There was a difference in the survival probability that met the 95% CI (Brinker et al., 2003).

Based on the results, Brinker et al. (2003) concluded that black women have significantly more aggressive tumors than white women when controlling for age

and stage. The presented tumor pathology is assumed to be predictive of survival. Therefore, if the survival of black women with breast cancer is to be improved, the aggressive pathological features of the tumors cannot be ignored. Brinker et al. (2003) suggested that taking into account the negative prognostic features of many tumors in the African American population; treatments should be altered, even in the early stage setting.

The strengths of the study include the large sample size, the consistency of the findings among the African American breast cancer population, and the innovative design of the study (looking only at early stage breast cancer). One limitation of the study was that there were no graphs or charts to aid in clarifying the data. Tables were presented listing the data in columns, but visual representation of the data would have been helpful due to the substantial data. A second limitation was that there was no recommendation for further study (Brinker et al., 2003).

Dignam (2000) explored the research surrounding the prognosis of breast cancer in Caucasians compared with African American women. The researcher uses both historic and recent literature to present an in depth look at the multiple causes theorized to be linked to the poor breast cancer prognosis in African American women. The first factor was the advanced stage of disease at diagnosis. Studies such as the 1996 SEER program (as cited in Dignam, 2003) reported that African American women consistently present with a more advanced stage of breast cancer than Caucasians. Findings also suggest that even when the stage at diagnosis for blacks is the same as whites, the black women still experience a poorer survival rate (Dignam, 2003).

A second factor researched by Dignam (2003) was the pathological tumor characteristics. Multiple studies have been done such as a survey by the American College of Surgeons and by the University of Texas have found that black women present with estrogen and progesterone negative tumors more often than white women. A study done at Birmingham's University Hospital, compared the estrogen and progesterone receptors of their patients and found that African-American women were more likely to have negative tumors. NCI's BWCSS also found that African American women had significantly poorer prognosis based on their tumor characteristics. The poor characteristics found include negative hormone receptors, high grade nuclear atypia, and poorly differentiated tumors (Dignam, 2003). Dignam (2003) concludes that, "Results from the studies suggest that the tumor characteristics of African American women have poorer prognostic features in comparison to Caucasians, even when stage is comparable" (p. 55).

Chu, Henson, and Levine (2003) conducted a study regarding histological tumor grade, stage, and survival of breast carcinoma in African American women and Caucasians. The problem addressed was African American women diagnosed with breast cancer have a poorer survival rate than Caucasian women. The hypothesis was that the aggressive tumor contributed to the advanced stage and poor survival rate of African American women. No theory of framework or review of literature was discussed in this study.

Data was collected from the SEER program from 1992 to 1999. The SEER program covered 11 geographic areas and represented approximately 12% of the US population. There were 20,064 white and 2,828 black women with breast cancer studied. The pathology reports of diagnosed breast cancer were reviewed. The

breast cancers were staged using the TNM classification into four stages. The tumors were then put into four classes based on grade. The tumor grade was dependent upon tumor size (parameters given). The tumors were grouped by race (black and white) and by age (<50 or >50 years of age). The findings were reported using bar graphs. The six year survival rate was also looked at using death certificates. The patients anonymity was kept, this was the only ethical consideration addressed.

The findings showed that African-American women had higher grades and stage of tumors regardless of age compared with Caucasians. In both age groups, Caucasians had proportionally more Grade I and II tumors, and African American had a higher proportion of Grade III tumors for all stages. Findings also showed that the six year survival for African American in (<50 years of age) was consistently lower than Caucasians (0.84 vs. 0.68), although this was not statistically significant, it was a consistent finding in 11 or 14 combinations of stage and grade that were analyzed. The six year survival was also found to be poorer in African American women >50 years of age in 12 of 13 combinations were evaluated. The overall survival difference was 0.86 vs. 0.74, this was not statistically significant, but notable (Chu et al., 2003).

Chu et al. (2003) concluded that the findings suggest that African American women have biologically more aggressive tumors than Caucasians. Chu et al. (2003) emphasized two key points. First, much research has been focused on socioeconomic facts, access to care, less utilization of screening and treatment differences as the potential cause of the disparity of survival, Chu et al. (2003) suggested that the findings of the study related to the histology of the tumors must be

considered as a potential cause. Secondly, Chu et al. (2003) emphasized that the higher grade tumors were found in all tumor stages compared with Caucasians. Therefore, early detection in the African American population still may not improve the disparity. Limitations of the study include the subjective assessment of the grade of tumors by practitioners; this assessment is a, "Function of education and practice experience, which varies among institutions" (Chu et al., 2003, p.916).

In summary, the literature reviewed suggests that African American women have biologically more aggressive tumors than Caucasians. This would suggest that more research needs to be done to explore this arena giving practitioners necessary data to plan treatments appropriately for African American and Caucasian women. Also, though the studies reviewed did suggest clinically more aggressive tumors in African American women, emphasis was also made that this factor alone cannot account for the disparity.

Socioeconomic Factors

Differences in the distribution of socioeconomic factors by race have been suggested as a reason for the disparity of breast cancer survival in African American and Caucasian women (Baquet & Commiskey, 1999). Baquet & Commiskey (1999) conducted a descriptive study looking at socioeconomic status as a risk factor for breast cancer survival, incidence, and mortality. Multicultural populations were grouped into five classes: American Indians/Alaska Natives; Asians and Pacific Islanders; African Americans; Caucasians; and Hispanic/non-Hispanic ethnicity. Data on the five population categories were collected from four sources. One source was the National Cancer Institute Surveillance, Epidemiology, and End Result Program (NCI SEER program). NCI SEER is a data registry that collects

information regarding cancer incidence, mortality and survival from geographic regions. The U.S. Bureau of the Census was used to collect data on health insurance, poverty, income and education of the population under investigation. The National Center for Health Statistics (NCHS) and Behavioral Risk Factor Surveillance System was used to collect information regarding mammogram use (Baquet & Commiskey, 1999). Results found that the breast cancer incidence rates from 1998-1992 were highest for white (111.8 per 100,000) and third highest from blacks (95.4 per 100,000). Mortality rates for the same time period were highest for blacks (31.4 per 100,000) and second highest for whites (27 per 100,000). Five year survival rates for blacks were 70% compared with whites at 86% (Baquet & Commiskey, 1999). The socioeconomic level of the same population group was studied by Baquet and Commiskey (1999), results showed that 26.5 % of black individuals and 23.6% of black families live in poverty as defined by the U.S. Bureau of the Census. Comparatively, 11% of white individuals and 8.6% of families lived in poverty. Also 21.5 % of blacks had no insurance, whereas 15% of whites were uninsured. The results suggested that low socioeconomic status correlates with advanced disease at diagnosis and carries a high mortality rate. Higher socioeconomic status was associated with less advanced disease at diagnosis and higher survival rates (Baquet & Commiskey, 1999). Despite the findings, the researchers emphasized socioeconomic factors alone did not explain survival disparity, and that further research was needed in this area. The limitation of the study was cited as the difficulty in measuring an individual's income; The U.S. Census was an estimate on the subject's income based upon their address, and can not be considered completely accurate (Banquet & Commiskey, 1999).

Edwards, Lannin, Matthews, Mitchell, F. Swanson, & M. Swanson (1998) conducted a long term study to evaluate the influence of socioeconomic and cultural factors on racial difference in breast cancer prognosis. The population consisted of 540 women who were diagnosed with breast cancer between 1985 and 1992 at the University of Eastern North Carolina. A control group of 414 women was also established from the community with similar age, race and area of residence. Two methods were used to collect data. The subjects' medical charts were reviewed to assess for tumor stage, and both the control group and the subjects were interviewed by a trained resident of the community. The interview consisted of 173 questions that was developed by a cultural anthropologist and was orally administered (Edwards et al., 1998).

Edwards et al. (1998) reported that of the 540 patients interviewed, 17.4% presented with TNM stage of III or IV disease. The following characteristics were found to be significant predictors of advanced stage at diagnosis: being African American (odds ratio [OR], 3.0: 95% confidence interval [CI], 1.9-4.7); having low income (OR, 3.7: 95% CI, 2.1-6.5); having no private health insurance (OR 2.5 95% CI, 1.6-4.0); and putting off seeking medical treatment because of money (OR 1.6; 95% CI, 1.1-2.5) (Edwards et al., 1998). Cultural beliefs were also found to be significant predictors of advanced stage. One example of a cultural belief is that "air causes cancer to spread" (OR, 2.8: 95% CI, 1.8-4.3). Folk beliefs were more common among the African American subjects and those with lower economic status (Edwards et al., 1998).

Upon data analysis, Edwards et al. (1998) found that the OR for advanced stage of breast cancer at diagnosis of African Americans compared with Caucasians

drops from 3.0 to 1.8 when the socioeconomic or cultural variables were considered. When both variables were added to the model the OR dropped to 1.2. Therefore, Edwards et al. (1998) concluded that it appears that race, socioeconomic status, and cultural beliefs play a role in the prognosis disparity among the black and white women. One limitation of the study was the lack of discussion of the control group. It would have been advantageous to look at the control group's socioeconomic status compared with their cultural beliefs. Also, whether the results of the study can be generalized to a broader population is a question since the study focused solely on a rural community.

Social and economic factors were investigated by Dignam (2003) as a potential contributing factor in the poor breast cancer survival in African American women. Dignam presented multiple studies that suggested there was an association between women's income level and survival, regardless of the race. One such study noted was done using the 1990 census. Socioeconomic measures for 1,132 white and 253 black patients with breast cancer diagnosed between 1974 and 1985 revealed that low socioeconomic status strongly correlated with poor prognosis. Another study cited was done in 1986 and looked at the correlation between income, stage at diagnosis and race in breast cancer cases listed in the New York City Cancer Registry between 1976 and 1981. The study compared 47,198 whites and 4,443 blacks. Results showed a significant association between black/white diseases stages by per capita income. African American women with higher incomes demonstrated a minimal difference in stage at presentation compared with Caucasian women with similar income. Dignam (2003) also noted that measuring social and economic

factors is difficult because of limited information; rather this is usually inferred from the geographic location of the population.

Baquet & Commiskey (1999) found that a significantly higher number of African American women live in poverty compared with Caucasians. Studies suggest that an individual's income level correlates with their breast cancer prognosis and survival. Based upon literature reviewed, the findings warrant further research in this area to assess exactly what association low income has with poor disease prognosis. What is the cause, is it lack of education, lack of access to care or apathy? What core issue related to low income causes the decrease in breast cancer survival? Is this a separate variable from race, or are they connected?

Access to Medical Care

Bibb (2001) defined access to care as, "those dimensions that describe the potential and actual principally in terms of availability of care or in relation to economic factors and health insurance coverage" (p. 711). It also was suggested by Bibb (2001) that barriers to access can occur both at a health care setting or in an individual's willingness to seek healthcare due to economic concerns or personal motivation. In researching the effect access to care has on stage at diagnosis of breast cancer in African American and Caucasian women, Bibb (2001) developed a descriptive comparative study with the purpose of identifying the relationships between potential access, realized access and stage diagnosis. The framework for the study was based upon the Aday/Anderson Framework for the Study of Access. The sample population consisted of 573 (90%) Caucasian women and 62 (10%) African American women that were diagnosed with breast cancer or receiving treatment at the Naval Medical Center (NMC) in California between 1988 and 1997.

All participants were part of the military system. Military Health Services health care policy provides equal access and care to all active duty, retired members and family members. The instrument used was the Breast Cancer Medical Record Data Collection Sheet. Data was collected from the NMC. Approval for the study was acquired from the Scientific Review Committee of the NMC (Bibbs, 2001).

Bibb (2001) found that 59% of African American women were diagnosed with breast cancer of stage 2 or higher compared with 41% of Caucasians. 46% of blacks discovered their tumors incidentally, 18% discovered them through breast self exam, and 21% of tumors were detected through mammogram. In contrast, 30% of whites found their tumors through incidentally, 9% through intentional breast exam and 52% by mammogram.

Bibbs concluded, "This profile for African American women mirrors the profile for African American women diagnosed outside of the system and has specific implications for the provision of breast health care and education to American American women" (p. 717). Recommendations were made to encourage health care providers to stop focusing on access and begin to address issues of willingness and necessary education to encourage black women to seek out breast care and perform monthly self breast exams. Limitations of the study include small sample size of African American women (10%) and its design of collecting data solely from the tumor registry (Bibbs, 2001).

In light of the overwhelming research that demonstrates African American women diagnosed with breast cancer experience shorter survival time than Caucasians, Optenberg, Spinks, & Wojcik (1998) focused in on one alleged cause, unequal access to health care. The purpose of their study was to explore the

differences in survival between African American women and Caucasian women whose breast cancer is diagnosed and treated in the US military health system. The stated hypothesis was, "Equal access to health care facilities, including the opportunity to receive similar medications and methods of treatment within similar time frames should diminish differences in survival rates among racial groups" (Optenberg et al., 1998, p. 1311).

The study was a retrospective review of breast carcinoma cases in the Department of Defense (DoD) Central Tumor Registries years 1975 to 1994. The population consists of 6577 women (5879 Caucasian, 698 African American) who were beneficiaries of the DoD and diagnosed and treated in U.S. Military health care facilities. The age span was 19-97 years of age. Multiple variables were looked at. Clinical variables included date of diagnosis, date of treatment, date of last contact, type of cancer, stage of tumor, pathological primary tumor size, and number of positive axillary lymph nodes, overall grade and type of treatment. Treatment was broken down into four categories; radiotherapy (hormone therapy and radiation), hormone therapy, chemotherapy and all treatment combined with surgery. Demographic variables included age, ethnicity, marital status, military dependent status, family history of disease (any cancer) and tobacco and alcohol use. A third variable was equal access, which included method of treatment and waiting time between diagnosis and treatment. The final variables considered were stage at diagnosis and recurrence rate (Optenberg et al., 1998).

The characteristics of African American and Caucasian women were compared using the Students t-test and chi square analysis. A Kaplan-Meier estimate of survival curves showed a statistically significant ($P=0.0001$) difference in survival

between the races. Tumor stage at diagnosis was the strongest predictor of survival. Of note there was no statistical difference in survival by stage between African American and Caucasians, except for stage II (0.017). African American women were diagnosed more frequently at Stages II and III than Caucasian, 48.86% vs. 38.65% respectively.

Results showed no difference between the races in the area of method of treatment and waiting time between diagnosis and treatment. The average wait time was 21.15 days for African American and 29.51 days for Caucasians. Surgery was the most common treatment for both races. Caucasian women had higher reporting of tobacco and alcohol use than African American women (31.7 vs. 25.6 tobacco use, 25.5 vs. 31.4% alcohol use). The recurrence rate was not significantly different between the races (Optenberg et al., 1998)

The results of the study showed that the five year mortality rate for African American women was 1.37 that of Caucasian women, 24.77% versus 18.08% respectively. In the DoD system this number is better than results of SEER, which has a five year risk of death at 1.86 for African American women compared with Caucasians, 34.2% versus 18.4% respectively. Though there is a significant difference in survival between the races, this study does suggest that equal access to care reduces the disparity. Future research suggestions included studying the tumor biology, socioeconomic status, and cultural considerations that could play a role in the disparity (Optenberg et al., 1998). Limitations of the study include limited information from the tumor registry such as whether the women participated in preventive screening or their socioeconomic status. Another limitation of the study is that the lifestyles, resources, education levels and support were similar in the

subjects (Optenberg et al., 1998). Therefore, these could be contributing factors in the improved outcome for African American military women. Strengths of the study included the large sample size, the high number of variables examined and lack of opportunity for bias in exploring the data.

Access to medical care is a fundamental area to be explored when researching the difference in prognosis of breast cancer between African American and Caucasian women. In the United States there is a wide range of availability of health insurance and health care access. Retrieving medical care is a “strong factor in contributing to stage and survival differences among multicultural populations” (Hunter, 2000, p. 1199). Though studies show that equal access to health care does improve the survival difference, it does not completely eliminate the disparity (Optenberg et al., 1998).

Utilization of Screening Tools

Buchner & Jazieh (2002) state, “Screening mammography improves the chance of early detection of breast cancer, leading to better outcome among screened women” (p. 1145). Buchner & Jazieh (2002) looked at the phenomena of mammography rates in Arkansas based upon race and age, to identify any disparities in obtaining mammograms.

Buchner & Jazieh (2002) conducted a comprehensive survey of 112 mammography centers throughout Arkansas. Patient demographic and mammography exam data was collected. Demographic information collected included age, race, zip code of residence, insurance status, and date and type of mammogram. The women were put into two groups, age 40-64 and >65. Using the Arkansas Mammography Data Collection Project Database, the mammography type,

insurance, and race were calculated for each group. Data was collected on 133,549 women. The mammography rates were 23.3% for the younger group and 21.7% for the older group. Most of the mammograms were described as screening, 60%. Race data was accessible for 64,526 women. African American women were less likely to get mammograms than Caucasian women in both age groups (8.0% vs. 11.3%, $P < .001$ in younger women and 7.2% vs. 11.6, $P < .001$) (Buchner & Jazeih, 2002).

Analysis of the data by Buchner & Jazeih (2002) revealed interesting results; African American women were less likely to obtain a preventive mammogram than Caucasian women. Conclusions were made that this result could be a contributing factor to the high mortality rate of breast cancer among African American women. Recommendations were made for further studies that could help design public health intervention to address this trend. The most significant limitation of this study was a lack of a research question or hypotheses.

Barron, Foxall, & Houfek (2001) also examined the ethnic influences on breast and gynecological screening practices. Barron et al. (2001) noted that recent literature and studies show that despite the availability of breast screening tools, African American women tend to use them less than Caucasians. They suggest that this trend creates disproportionately high mortality of breast cancer in African American women. The purpose of the study was to examine the ethnic influence on body awareness, trait anxiety, and breast cancer screening practices (Barron et al., 2001).

The design of the study is a comparative, descriptive secondary analysis. The sample was obtained through random and convenience sampling. Initially, names were selected from a residential mailing list in a large city in the Midwest. Women

were sent letters and then followed by telephone calls from a research nurse. To increase the number of African American women, convenience sampling was also used. Women were either approached or telephoned from predominantly ethnic churches and communities. The final sample included 138 Caucasians and 37 African American women. Informed consents were obtained from each subject prior to initiation of the study. The inclusion criteria were that subjects be >19 years of age and have no personal history of breast cancer. Structured questions were given in the subjects' home, the test took approximately 45-60 minutes to administer. Four instruments were used. The first interviewee was asked the following questions: "During the past year how many times did you examine your breasts?"; "During the past five years how many times did a health care provider examine your breasts?"; and "How many mammograms did you have during the past five years?" The responses were open ended and coded as discrete numbers. The second instrument was an 18-item, seven point Likert-type scales ranging from one (not true at all) to seven (very true about me). The objective is to measure self awareness of bodily processes. A third instrument was the Trait Anxiety Inventory (TAI), a 20 item four point Likert scale ranging from one (never) to four (always). The goal was to measure an individual's level of anxiety. The final instrument was perceived risk of breast cancer which was measured using the open ended question was "How concerned are you about getting breast cancer?" Demographic information was also collected on the subjects. The Pearson product moment correlation coefficients were used to establish the correlation of body awareness, trait anxiety, and perceived risk to the three measures of breast cancer screening. The alpha was set form 0.05 for analysis (Barron et al., 2001). The results of the research listed are listed in Table 1.

Table 1

Descriptive Statistics for Caucasians and African American Women (2001)

Variables	x	SD
Body Awareness		
Caucasian	77.32	17.16
African American	74.94	21.19
Trait Anxiety		
Caucasian	35.84	9.75
African American	34.38	4.47
Perceived risk		
Caucasian	4.03	1.91
African American	3.81	2.38
Screening Practices		
Breast Self Exam (last year)		
Caucasian	8.76	9.72
African American	23.30	62.86
Clinical breast exam (last five years)		
Caucasian	4.35	2.74
African American	4.33	2.52
Mammogram (last five years)		
Caucasian	2.95	1.94
African American	3.56	1.91

In examining the results and how they relate to breast cancer screening. Several themes appear. African American women reported more frequent BSE and mammogram than Caucasian women; there was minimal difference in CBE. Foxall et al. (2001) noted that these results were inconsistent with previous studies that have found that African American had fewer mammograms than Caucasian women. Barron et al. (2001) state, "The increased use could partially be a results of multiple efforts, such as improved access and increased funding, particularly through the American Cancer Society and Medicare reimbursement" (p. 733). African American women reported the lowest level of perceived risk for developing breast cancer. Findings also reported that African Americans had the least awareness of their bodies; therefore they could be less aware of bodily changes that could signal development of breast changes. High anxiety in the African American population correlated with decreased use of mammograms (Barron et al., 2001).

Further research was suggested in the areas of determining how women perceive their cancer risk. Another suggestion was to examine what a women's criteria is for a BSE. Limitations include selection bias and participant bias. The only method of data collection of screening practices was the patients own word, there was no external guarantee of the accuracy of their reports (Barron et al., 2001).

Barton, Elmore, Kreuter & Reisch (2000) looked at utilization of breast cancer screening tools in a HMO. National surveys show that African American women obtain less breast cancer screening than white women. Many theorize that the rationale for this phenomena is the financial barrier. The objective of the study by Barton et al. (2000) was to eliminate this factor by looking at the screening practices of participants (see Table 2) in an HMO where access to medical care was equal.

The samples were selected through random sampling. Women were chosen from members of an HMO, Harvard Pilgrim Health Care, which is a large HMO in New England. Women were included in the study if they met the following inclusion criteria: health coverage was obtained from Harvard Pilgrim Health Care solely between July 1, 1983 and June 30, 1995; and did not have a history of breast cancer, prophylactic mastectomy or breast implants during the study period. A total of 2072 women met the inclusion criteria. Abstractors reviewed the medical records of all the subjects, and reviewed 27% of the patients charts individually (Barton et al., 2000).

Table 2

Characteristics of HMO Study Members by Race (2000)

Characteristic	African American (n=261)	Whites (n=1,811)
Age as of 1983, mean, y	50	52
Annual estimated household income, mean, \$	41,713	58,542
Body mass index, mean		
1983-1988	28.4	25.8
1988-1993	29.4	26.2
Estrogen ever used, %	21.1	29.5
Family history of breast cancer, %	17.0	17.0

Multiple variables were assessed using the individuals' chart. Demographic information included race, age and estimated household income. The household income was figured by taking the address of the subject, comparing it with the median income from the U.S. Census tract data for that area. Other factors

considered include estrogen use and family history of breast cancer. The racial differences in mammogram recommendation by the primary care physicians and the subject's compliance with the recommendation were also explored. The goal of data analysis was to compare demographic information, clinical history, compliance and screening rates between the races, χ^2 and t test were used. The SAS version 6.04 was used for data analysis (Barton et al., 2000).

The patient characteristics reported by Barton et al. (2000) were as follows: 12.2% African American and 84.6% Caucasian; age in 1983 ranged from 40 to 69 with a median age of 52; African American women had a lower estimated income, higher body mass index and were less likely to use estrogen; and no significant difference in family history of breast cancer. In regards to screening recommendations and utilization, practitioners documented recommending a screening mammogram significantly more often for African American women (70%) than for Caucasians (64%, $\chi^2 = 12.4$, $P < .001$). African American (76%) women had lower compliance rates than Caucasians (82%, $\chi^2 = 13.64$, $P < .001$). The average numbers of screening mammograms reported were 3.93 for African Americans and 4.49 for Caucasians. Clinical breast exams reported were 4.92 for African Americans and 5.35 for Caucasians. The control variables (age, income, and estrogen and body mass index) were used in the analysis because they varied by race and could be contributing factors to screening. After adjusting for individual variables, the differences in mammogram use remained and the CBE was no longer significant. The results were compared with the National Health Interview Survey (NHIS) data and participants in the HMO had higher use of screening tools for African Americans (HMO 69% vs NHIS 30%) and Caucasians (HMO 78% vs NHIS

39%). The reported absolute difference in between African Americans and Caucasians in both studies (NHIS and HMO) was 9% (Barton et al., 2000).

The discussion by Barton et al. (2000) centered around possible explanations why the difference in screening use still existed after taking financial barriers out of the configuration (the HMO provided free mammograms). Possible explanations included lack of knowledge, cultural beliefs, lack of transportation, or distrust of physicians and health procedures. Despite the persistent disparity in screening utilization, the study report that women of both races in the HMO did have higher rates of screening than the national average (Barton et al., 2000). Limitations reported include potential difficulties comparing national data to the studies findings: national data was self-reported, whereas this study was based upon chart reviews. Another limitation was that the study did not address the mortality or morbidity of the sample; this could have enhanced the analysis of the true impact of screening use (Barton et al., 2000). No recommendations were made for further study and there was no theory of framework in the report. Strengths include the large sample size and the lack of opportunity for bias in analyzing the medical charts versus self reports.

Summary

The reviewed literature supports the conclusion that African American women experience higher mortality from breast cancer than Caucasian women. Based upon the literature reviewed, the origin of the disparity seems to be multi-factorial. Factors include the aggressive nature of the African American women's breast tumor, lower overall socioeconomic status, impaired access to care, and possibly poorer utilization of screening tools.

Studies regarding the breast tumor pathology of African American women all had similar findings, they present more frequently than Caucasian women with tumor characteristics that have poorer prognosis (Dignam, 2003). Hunter (2000) states "Breast carcinoma in African American women is biologically more aggressive, with more poorly differentiated tumors, high grade nuclear atypia, and less estrogen receptor positivity (p.1200). Chu et al. (2003) also concluded that African American women, regardless of age, presented with more aggressive tumors for all stage of disease and each tumor size above 1.0 cm (p. 908). Brinker et al. (2003) found that blacks presented significantly with "higher-grade tumors, hormone receptor-negative tumors, higher proliferation indices, and node-positive disease (p. 372). Of note, all studies reviewed asserted that tumor pathology alone did not fully account for the disparity and that further research in this area was needed.

The research reviewed regarding socioeconomic status concurs that studying this element is difficult because of lack of sufficient data relating socioeconomic status and breast cancer mortality. Edwards et al. (1998), concluded that socioeconomic status and associated cultural beliefs were strong prognostic indicators of late stage presentation, associated with poor prognosis. Baquet & Commiskey (2000) stated that "Lower socioeconomic status is related to poorer health outcome, including higher breast carcinoma mortality, higher stage at diagnosis, and poorer breast carcinoma survival" (p.1262). These findings correspond with Edwards et al (1998). One notable difference between the two studies is that Baquet & Commiskey (2000) did not explore the cultural beliefs associated with lower income. Dignam (2003) also found that there was a negative correlation between socioeconomic status and breast cancer survival.

Researchers concurred that equal access to health care improves, but does not eliminate, the breast cancer survival difference between African Americans and Caucasians. The two articles explored research studies looking at populations with equal access to health care to assess if the equal access impacted the breast cancer survival between the races. Bibb (2001) found that barriers “seemed to occur at the individual level (versus health care system)” (p.717). Optenberg (1998) also found that an equal access health care system did not eliminate the increased mortality for African American women. Both studies, when comparing their data to national data did show increased survival in the African American women in the equal access health system. These studies suggest that further research in this area is need to discern whether African American women are less likely to seek health care because of economic barriers, or if the barriers are internal.

The studies exploring the under utilization of screening tools as a contributing factor in breast cancer mortality in African American women presented conflicting results. Barron et al. (2001) and Buncher & Jazieh (2002) concurred that African American women were less likely to obtain mammograms than Caucasians. Barton et al. (2000) found that African American women, in a HMO who offered free mammograms, obtained the mammograms at similar rates compared to the Caucasians in the same HMO. The conflicting data suggest that research in this area is crucial to assess whether this is an area that health care workers need to focus on as a contributing factor to breast cancer mortality disparity, or if mammograms really make a difference in early detection and survival.

CHAPTER THREE METHODOLOGY

Research Design

This research study was designed to determine if there was a survival difference in our sample of African American and Caucasian women diagnosed with breast cancer at a large medical center in the southeastern United States. If there had been a disparity, then a regression analysis would have been done to examine the relationships between survival and stage at diagnosis, hormone receptor status, survival, age and socioeconomic status. A descriptive comparative design will be used for this research study. The strengths of this type of design include the ability to explore data on a large population over time with minimal expense. In addition, the design would allow the researcher to explore the relationship between many variables simultaneously. A weakness may be the records are dependent upon physicians, nurses and patients providing all of the data correctly and fully.

Population and Sample

The population for this study consisted of all Caucasian and African American women diagnosed with breast cancer or receiving initial treatment at the medical center between January 1, 1997 and December 31, 2000. The sample size was 401 women. The sampling criterion is any African American and Caucasian woman diagnosed with breast cancer in the given time frame at the cooperating facility, stages I through IV. If the patient has two separate diagnosis of breast cancer, only the first diagnosis will be used. Records will be excluded if the subject's information is not complete, such as the physician not filling out the appropriate papers or if the survival data on the patient is not current.

A random sampling method will be utilized. Study eligibility includes only women with diagnosis of breast cancer will be explored, versus all the women with records in the tumor registry. A strength is also the large sample size. For example an indigent hospital was used that treats every individual diagnosed with breast cancer, they are offered treatment at the tumor clinic regardless of their insurance or ability to pay. This may skew the sample population to over represent individuals with sparse economic resources due to the services provided by this facility. Therefore generalizability is limited.

Setting

The setting for this research study will be at a large teaching, public medical center in a medium sized city in the southeast, it is located in downtown. The population of the city is approximately 156,000. The population consists of 59.7% Caucasian and 36% African American (AreaConnect, 2000). The medical center runs a "Tumor Clinic", which is a clinic within the hospital that offers free care to any patient diagnosed with cancer at the facility. All oncologists who practice there alternate days providing free care to the patients in the clinic, the clinic is also staffed with two full time RNs. In addition, all patients who chose to receive treatment are provided with free van transportation to and from the medical center whenever needed if they live in the county. If they live outside the county lines, a social worker arranges free transportation for them to and from the hospital. All medications that the patient needs are also provided to them free of charge.

The source of data that will be utilized is the tumor registry. The tumor registry is a data records system that keeps records on all cancer patients diagnosed at the medical center. Information includes demographic, pathological, and survival

status, records have been kept since 1980, and computerized since 1990. The strength of this setting is that the tumor registry allows the researcher to collect a large volume of data on each subject with minimal expense and allows for multiple variables to be explored. A weakness of this study is that individuals who are treated at the center may not be proportionally representative of the population in the city. Because the medical center is an indigent hospital there will be a disproportionately higher number of subjects with low socioeconomic status than if the study was conducted at a private hospital. Another drawback is that the data sources at the facility do not contain specific income levels, only information that suggests the economic resources, such as employment status, zip code and health insurance status.

Ethical Considerations

Approval to conduct this research study was obtained from the Thesis Committee at Southern Adventist University. Internal Review Board permission was excluded at the cooperating facility since it was a retrospective study.

Protection of human subjects' rights will be employed in various ways in this research study. All the information that is collected will remain confidential throughout the collection process and thereafter. The identities of the subjects will not be revealed at any point in the study or after it is complete. Specifically, the data collected on individuals in the tumor registry will not have identifiers on it; each subject will be assigned a random numeric code. The raw data collected will be transferred from paper to computer disk and both the papers and computer disk will be kept in a lock box. If a subject comes from a zip code with five or less representatives in the registry, then the subject will be eliminated. All identifiers will

be removed in presentation of the data. Data will be kept for one year after the research is complete in a lock box and then the papers will be shredded and disposed and the computer disk will be erased.

Instrumentation

The investigator retrieved data from the tumor registry in the form of an Excel spread sheet prepared by the tumor registry coordinator.

Data Collection

The researcher requested specific data from the Tumor Registry Coordinator at the cooperating facility. Requested data included all breast cancers diagnosed between 1997 and 2000, including stage at diagnosis, race, age, hormone status, zip code, date of diagnosis and survival in months. This data from the tumor registry was transferred manually by the researcher into the SPSS program. The subjects had random numeric identifiers initially when the Tumor Registry Coordinator presented the data on the spread sheet. The data on the spreadsheet and the transferred data on a computer disk was kept in a lock box during collection and thereafter. After one year, the data will be shredded and the computer disk will be erased. No training will be required; the data collection was done by the researcher and the Tumor Registry Coordinator at the cooperating facility.

Data Analysis

Data will be analyzed using SPSS, the Statistical Package Analysis for the Social Sciences, version 12.A 0.05 level will be used to indicate statistical significance for all statistical procedures. Descriptive statistics (mean, frequency, distribution) are used to summarize demographic characteristics of the sample. A t test was used to determine if there was a survival difference between the two races.

If there was a survival difference, then regression analysis was to be used to explore contributing factors including age, stage at diagnosis, tumor features and socioeconomic status.

Limitations

Limitations of the method chosen include incomplete insight into the true economic status of the subjects. Basing the average income on suggestive factors such as marital status, type of insurance and residence will give limited portrayal of the socioeconomic level. Also, the method of gathering data does not include information related to the preventive measures that the population utilized. This variable would have been helpful to gain a higher level of understanding of the relationship between screening tools and mortality among the two races. Due to the data collection method chosen, this information could not have been obtained without the researcher contacting each subject individually.

Another limitation is that the researcher does not gather data relating to comorbidities of the subjects. Therefore, there is no way of assessing whether stage at diagnosis is related to pre-existing conditions. In relation to patient's survival, the study assumes that the patient's expiration, if applicable, is related to the breast cancer and does not take into account the possibility of another condition causing the patient's expiration.

Significance of Potential Findings

Findings of the study would be of considerable benefit to the participating medical center in giving ideas as to how to better serve the African American population by implementing strategies to reduce mortality from breast cancer. In order to come up with a solution, the problem must first be identified. Therefore,

isolating the cause/causes of the disparity, specifically the medical center population will enable the facility to develop specific tactics to increase African American survival rates from breast cancer.

The findings could also be generalized to other indigent hospitals in the United States. The primary reason indigent hospitals may benefit is because providing care to all individuals regardless of financial resources negates a common variable, access to care, which has been shown to inversely correlate with breast cancer mortality. Therefore, indigent hospitals will likely have similar patient populations as the participating medical center could benefit from the results of the study because of the higher level of understanding of the source of the problem in the population they serve.

CHAPTER FOUR RESULTS

The purpose of this chapter is to present this study's findings regarding survival disparity between African American and Caucasian women as related to the research questions. The chapter will also include the demographics of the sample.

Demographics

The sample size was 401 women diagnosed with breast cancer between 1997 and 2000 in an indigent hospital in an urban setting. Of the 401 women, 84.1% ($N=338$) were Caucasian and 15.9% were African American ($N=63$). The average survival in months for Caucasian women ($M=57.27$, $SD=30.99$) was greater than in the African American women studied ($M=50.98$, $SD=23.12$). However the difference in survival between the two races was not statistically significant ($t=1.867$, $p=.065$, $df=108.22$).

Research Questions

The research questions with the respective results are as follows:

1. Is there a mortality disparity between African American and Caucasian women diagnosed with breast cancer in our sample?

After analyzing the data, the t-test results showed that while there was a difference in breast cancer survival rates between African American and Caucasian women in the study sample, it was not statistically significant.

2. If the disparity exists, is the difference in survival related socioeconomic status, age, stage at presentation or presenting pathological features of the tumors at diagnosis?

The data was analyzed using a t-test which did not detect any significant difference in survival years between African American and Caucasian women

diagnosed with breast cancer. Since no survival difference was found, no further data analysis was performed.

CHAPTER FIVE DISCUSSION

Based upon the literature reviewed, studies consistently demonstrated a survival disparity between African Americans and Caucasians in a variety of settings. A number of variables have been hypothesized as potential contributing cause of the disparity, but as to date, according to the literature reviewed, there has been no single cause identified. Therefore, the purpose of this study was to retrieve data from an indigent hospital that offered medical treatment to all patrons regardless of ability to pay, and determine if the survival disparity was present in this particular population. If the survival difference was present, then the goal of the study was to explore contributing potential factors, tumor pathology, stage at diagnosis, age and socioeconomic status, and assess the impact on survival.

After gathering data and reviewing the results, no significant survival difference was found between Caucasian and African American women diagnosed with breast cancer in the study sample. Therefore, it was not necessary to complete further data analysis.

In this chapter, the impact of these studies' results will be explored by comparing them to Neuman Systems Model and to the literature review. An analysis of the meaning of the findings is based upon the researcher's experience. The significance of the findings for the body of nursing knowledge as recommendations for further research will also be included.

Discussion

The findings of the study demonstrated that there was not a significant survival disparity in the examined population. The majority of the literature reviewed showed a significant survival difference between African American and Caucasian

women diagnosed with breast cancer. For example, Brinker et al. (2003) explored a sample in a larger medical center in North Carolina that consisted of 910 women, 150 African Americans and 760 Caucasians, with early stage breast cancer. This study demonstrated a significant five year survival difference between Caucasian and African American (93.5% vs., 86.4%). The study performed was similar to Brinker et al. (2003) in regards to the percentage of African American and Caucasian participants (16% and 84% in Brinker et al. (2003), and 15.7% and 84.3% in this study), as well as the settings being in the Southeast. But the two studies contrasted in survival outcomes. The Brinker et al. (2003) study was larger in sample size (910 vs. 410) than this study. There was no reference made in Brinker et al. (2003) that the hospital provided indigent care.

Another research study by Chu, Henson, and Levine (2003) examined data collected in the SEER over seven years. The sample size was 20,064 Caucasians and 2, 828 African Americans and was across eleven geographic areas. The findings showed that the six year survival rate was not different between African Americans and Caucasians (0.84 vs. 0.68). This was the only study reviewed that did not show a significant survival difference between the two races. Chu, Henson and Levine (2003) and this research study were similar in disproportionate sample size between the races and lack of significant findings. But the two studies were not comparable in relation to sample size, geographic location, and source of data (indigent hospital registry versus NCI registry).

Dignam (2003) explored the role of socioeconomic status in relation to survival. Data were used from the New York City Cancer Registry between 1976 and 1981, comparing 47,198 Caucasians and 4,443 African Americans diagnosed

with breast cancer. Results showed that there was no significant difference in survival when the African American women had higher incomes. Although Dignam study and this research study are very different as far as sample size, location and exploration of socioeconomic data of the sample, there are some interesting conclusions that can be inferred. Dignam (2003) found that African American women with higher economic status had no significant survival difference from Caucasians. This study's setting in an indigent hospital where medical treatment is given to all women regardless of economic status also showed no survival difference. These two studies suggest that when socioeconomic status between the two races is even, there is no survival difference (Dignam, 2003).

Optenberg, Spinks and Wojcik (1998) explored mortality disparity of women diagnosed and treated in the US military health systems. The hypothesis was "Equal access to health care facilities, including the opportunity to receive similar medications and methods of treatment within similar time frames should diminish differences in survival rates among racial groups" (Optenberg et al., 1998, p. 1311). Using retrospective review of breast cancer cases in DoD tumor registries, the sample size was 6577 (88% Caucasian, 12% African American). Results showed that there was a significant difference in the five year mortality rates between the two races: 18.8% for Caucasians and 24.77 % for African Americans. These results were compared with national SEER data which showed a larger disparity between Caucasians and African Americans, 34.2% versus 18.4% respectively. The methods used in the Optenberg et al. (1998) study were essentially the same as this study. In addition, both an indigent hospital sample and the sample from the military had equal access to care, in that in both studies there are no barriers to health care

financially. It is surprising that the two studies differed in results, although interesting that the Optentberg et al. (2003) study demonstrated a smaller disparity than the national SEER study.

The Neuman Systems Model partially supports the results of this study. This framework was chosen because it helps portray African American women as being unique open system that interact with the environment, responding and adapting to stressors based upon their resources or with the aid of external resources. Based upon the literature reviewed, the majority of studies reveal that there is a statistically significant difference between African American and Caucasian women, with many potential contributing variables: access to care, socioeconomic status, and pathological features of the cancer. Neuman Systems Model serves as a solid framework when considering the multiple contributing factors to the development and course of breast cancer in African American women. However, this study showed no significant difference between African American and Caucasian women with breast cancer, which limits the use of this framework. The primary portion of the Neuman System Model that can be applied is the role of secondary prevention and its impact. Secondary prevention relates to symptomatology following a reaction to stressors, and treatment to reduce the effects (Neuman, 1995, p. 19). Based upon the literature reviewed, African American women have a higher rate of poverty than Caucasians, therefore it can be inferred that there is impaired access to health care based upon the way the health care system is set up in the United States. But, in this study, the secondary prevention (equal access to health care in an indigent hospital), following a stressor invasion (breast cancer diagnosis) facilitates a survival from breast cancer that is not statistically different from Caucasians. In conclusion, due to

the unexpected results of the study, there are only elements of the Neuman Systems Model that are applicable.

Conclusion

The results of the data showed no significant survival difference between African American and Caucasian women with breast cancer diagnosed at the participating facility between 1997 and 2000. Therefore, the answer to the first research question, "Is there a mortality disparity between African American and Caucasian women diagnosed with breast cancer?" showed no significant disparity existed. The second research question, "If the disparity exists, is the difference in survival related to socioeconomic status, age, stage at presentation or presenting pathological features of the tumors at diagnosis?" could not be answered due to the lack of disparity in the sample. These findings were not expected. The majority of the findings in the literature reviewed revealed a significant survival disparity between African American and Caucasian women with breast cancer. Dignam (2003) conducted the only study reviewed that did not show a significant survival disparity. Therefore as result of the literature reviewed and the researcher's personal experience with breast cancer patients, the results were not anticipated.

Significance of Findings

Due to the way the US health care system is set up, it is difficult for the findings from this study to be practically utilized by the nursing sciences. Nursing intervention directed at eliminating the disparity is somewhat limited. There are areas that nurses can act based upon deductions from research findings. These areas include things like setting up health fairs in African American neighborhoods. This would allow nurses to reach the African American women and educate them on the

importance of breast self examinations. In the process of educating the women on prevention, nurses could inform them of services offered at indigent hospitals as well as state and federal health care plans such as Medicaid or Medicare. Nurses, when joined together, also have the ability to make dynamic impacts on government legislation and funding. For example, if a state nurses association were to get involved, they could educate their legislators on research findings showing survival rates of African Americans. The goal for the nurses would be to solicit financial support for indigent hospitals performing these services and for more health fairs that allow nurses to reach the community and educate.

Recommendations for Further Research

Nursing research has a profound impact on the advancement of the profession. Nurses often have keen insight into situations that the scientific and psychological communities overlook. Therefore, it is essential that nurses continue to conduct research. When research is performed, not only are nurses discovering better ways of caring for patients, but also educating the community on the value of nursing as a profession.

Due to the understanding that research is a process, there is always need for further studies that would shed insight on previous studies. This research study is no exception, and additional studies are warranted to clarify the findings and their significance. In this particular study, it would have been advantageous to have a larger sample size, looking at data from the years 1990 to 2000 would have been beneficial to increase the sample size. Generally, in quantitative research, the larger the sample size is, the more accurate the results (Gillis & Jackson, 2002, p. 508). Random stratified sampling would have been helpful in eliminating the

disproportionate number of Caucasian women versus African American women had such a disparity in the sample. The data collection process was solely dependent upon the accurate reporting by physicians and nurses to the tumor registry of the patient's data. In theory, the charts could have been reviewed to avoid any errors in data reporting, but this would have been very time consuming and could have been limited based upon increased need for protection of patient confidentiality.

Future research that would build upon this study would be to repeat the process with other non-indigent hospitals in the same area. This would provide more information as to whether these findings are a result of the participating facility being an indigent hospital, or if the African American women in the geographic area have high survival rates from breast cancer. An additional recommendation for further research would be to repeat the study in other indigent hospitals in various geographic regions across the United States. Lastly, it would be interesting to see if the survival disparity existed in Canada where all health care is run and funded by the government.

The research findings were not expected, based upon literature reviewed, a survival disparity was anticipated between Caucasian and African American women. The study suggested that when there is equal access to healthcare, the survival disparity is narrowed. Therefore more effort is needed by the nursing community to provide African American women the opportunity to be provided with adequate health care. The findings should be cautiously interpreted and applied based upon limitations of the study. Further research is absolutely necessary in this area to provide more insight into eliminating the well documented disparity in mortality between the two races. It is important that this study found no survival difference,

but this could have been due to the research methods used. Therefore the study should be repeated in different hospitals in the same community as well as different geographic regions. The disparity in mortality found in other studies cannot be ignored by the nursing community, this study provides a small amount of insight into the problem, but warrants further investigation so that nursing interventions can be tailored most efficiently to begin to close the gap.

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