

COMPARISON OF BREAST CANCER AND DIABETES COVERAGE IN  
POPULAR US WOMEN'S MAGAZINES FROM 2015 THROUGH 2019

A Thesis

by

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## ABSTRACT

Breast cancer and diabetes are unquestionably major public health problems for American women; however, women are more concerned about breast cancer than diabetes. Women often overestimate their risk of dying of breast cancer and underestimate their risk of developing diabetes. Because women's magazines are a common source of health information for American women, the purpose of the current study was to use content analysis to compare the amounts and characteristics of breast cancer and diabetes coverage in five popular US women's magazines from 2015 through 2019. The results of the study revealed that more articles, words, and pages were devoted to breast cancer than diabetes and indicated that several differences existed between the coverage of the two diseases. Most of the diabetes articles, but almost none of the breast cancer articles identified disease prevalence. Almost five times as many breast cancer articles as diabetes articles identified screening as a risk-reducing behavior, and a little less than twice as many breast cancer articles as diabetes articles discussed treatment. Additionally, breast cancer articles tended to use more current or former patients as a source of information than diabetes articles, and diabetes mentioned more research; less than a quarter of all breast cancer and diabetes articles mentioned both a current or former patient and research within the same article. Lastly, breast cancer articles tended to identify unmodifiable risk factors whereas diabetes articles tended to identify modifiable risk factors; less than half of the breast cancer and diabetes articles that identified at least one risk factor identified both unmodifiable and modifiable factors

within the same article. Based on the results, women's magazines may help increase women's awareness of diabetes by devoting more coverage to the disease than at present. Additionally, identifying prevalence in more breast cancer articles and identifying screening as a risk-reducing behavior in more diabetes articles may help women develop accurate risk perceptions of the two diseases. Lastly, aiming for a more balanced discussion about treatment and unmodifiable and modifiable risk factors and using more current or former patients as sources of information in breast cancer and diabetes articles may help reduce stigma women feel about both diseases.

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## CHAPTER I

### INTRODUCTION AND LITERATURE REVIEW

Breast cancer and diabetes are unquestionably major public health problems for American women. Although women tend to worry about breast cancer more than diabetes (Wang et al., 2009), more women have diabetes, and more are diagnosed with diabetes each year. In 2018, 3.8 million women were living with a history of breast cancer (American Cancer Society, 2019a), and 12.8 million women had diabetes (Centers for Disease Control and Prevention, 2020). An additional 268,600 new invasive breast cancer diagnoses were estimated for 2019 (American Cancer Society, 2019a), and 738,000 women were newly diagnosed with diabetes in 2018 (Centers for Disease Control and Prevention, 2020).

Women consistently overestimate their risk of dying of breast cancer (Wang et al., 2009; Woloshin et al., 1999) and underestimate their risk of developing diabetes (Heidemann et al., 2019; Kowall et al., 2017; Wang et al., 2009). There were 42,466 deaths listed with invasive breast cancer as the underlying cause in 2018, and in the same year, there were 37,395 women with diabetes listed as the underlying cause of death (Centers for Disease Control and Prevention & National Center for Health Statistics, 2020). Moreover, diabetes is greatly associated with other serious health conditions such as heart disease, which is the number one cause of death of Americans (National Institute of Diabetes and Digestive and Kidney Diseases, 2017).

This thesis aims to compare the coverage of breast cancer and diabetes in popular US women's magazines from 2015 through 2019. By comparing magazine coverage of

diabetes with that of a disease evoking much greater public concern—breast cancer—this thesis aims to provide insight into how the media could contribute to increased public recognition of diabetes as a serious health concern.

### **Breast Cancer Background**

Breast cancer is a group of diseases, occurring almost entirely in women, where cells originating in the breast tissue grow uncontrolled, typically resulting in a mass. The type of breast cancer depends on the type of breast cells affected by the disease. Most breast cancer cases (81%) are invasive (American Cancer Society, 2019a), meaning cancer cells originally forming in the ducts or lobules of the breast escape into the surrounding breast tissue. In contrast, in situ, or non-invasive, breast cancers are characterized by cancerous cells that have not escaped the ducts or lobules of the breast.

A common screening and diagnostic tool for breast cancer is mammography, which involves the use of low energy X-rays to obtain an image of the breast. However, mammograms have some limitations. Abnormal mammogram screenings may result in unnecessary additional diagnostic procedures (i.e., follow-up mammograms or biopsies) for a screening that turns out to be a false-positive (Lehman et al., 2017). Additionally, if a mammogram detects a small tumor, it is most likely that the tumor would never have become large and led to clinical symptoms (Welch et al., 2016). Lastly, mammograms do not detect all breast cancers.

Cases of breast cancer are classified as local, regional, or distant (also known as metastatic) stage based on how far the cancer has spread upon diagnosis. Local stage cancer has remained in the breast, regional stage cancer has spread to surrounding

tissues, and distant stage cancer has spread to distant organs (American Cancer Society, 2019a). Sixty-four percent of women with breast cancer are diagnosed with local stage, 27% with regional, and 6% with distant (American Cancer Society, 2019a). The five-year relative survival for local, regional, and distant stage breast cancer are 99%, 86%, and 27%, respectively. The relative five-year survival rate based on the average experience of all women with breast cancer is 91% (American Cancer Society, 2019a), making breast cancer one of the most survivable cancers for women (Siegel et al., 2019).

Breast cancer is the second most diagnosed cancer in women after nonmelanoma skin cancers (American Cancer Society, 2020). As of January 2019, more than 3.8 million women were believed to be living with a history of breast cancer (Miller et al., 2019). The most recent age-adjusted incidence rate and mortality rate for breast cancer in American women were 128.5 cases per 100,000 and 20.3 deaths per 100,000 (Howlader et al., 2020). The breast cancer death rate has been decreasing since 1989; most recently, an annual 1.3% decrease in breast cancer mortality was observed (American Cancer Society, 2019a). The American Cancer Society credits increased early detection and improved treatment for the decrease in breast cancer mortality. A woman's lifetime risk of being diagnosed with breast cancer is about 1 in 8 (American Cancer Society, 2019a), but risk varies by race, age, and other factors.

Breast cancer incidence is highest among non-Hispanic Whites, but non-Hispanic Black women have the highest death rates; Asian/Pacific Islander women have the lowest incidence and death rates (American Cancer Society, 2019a). Breast cancer incidence also increases with age. A woman's likelihood of being diagnosed with breast

cancer in the next 10 years increases from 1 in 1,479 in her 20s to 1 in 25 by the time she reaches her 70s; the median age of diagnosis is 62 (American Cancer Society, 2019a).

The most common sign of breast cancer is a painless lump. The disease typically has no symptoms, especially when the cancer is at its most treatable stage. However, less common signs and symptoms include redness of the skin, breast pain, and changes to the nipple. Treatments for breast cancer include surgery, radiation therapy, and chemotherapy. A type of surgery, a mastectomy, involves removing all the breast tissue to treat or prevent breast cancer. A less extensive type of surgery, breast-conserving surgery, involves the removal of only the cancer and a small portion of the normal tissue around it, as opposed to the whole breast (American Cancer Society, 2019a). Radiation therapy involves the use of high-energy rays, and chemotherapy involves the use of oral or intravenous medicines to kill cancer cells. Oftentimes, a combination of treatments is used to treat breast cancer. Most women with local stage breast cancer undergo breast-conserving surgery with radiation, but many have a mastectomy (Miller et al., 2019). Most women diagnosed with regional stage breast cancer undergo a mastectomy with chemotherapy, and most women initially diagnosed with metastatic disease undergo radiation therapy, chemotherapy, or a combination of both, with no other treatments (Miller et al., 2019). About 25% of women initially diagnosed with metastatic disease choose to receive no treatment (Miller et al., 2019).

Risk factors are variables associated with an increased likelihood that an individual will develop or die of a disease. Some breast cancer risk factors are out of a woman's control (i.e., are unmodifiable), and some breast cancer risk factors are ones a

woman may have more control over (i.e., are modifiable). Unmodifiable risk factors for breast cancer include sex, age, genetics, family history, dense breast tissue, personal history of breast cancer, high-dose radiation to the chest, early menarche, and late menopause. Modifiable breast cancer risk factors include physical inactivity, alcohol consumption, menopausal hormone therapy, hormonal contraceptive use, first pregnancy after age 30, no pregnancies, and being overweight or obese. Notably, some modifiable risk factors may not be fully modifiable for all women. For example, fertility problems may lead a woman to have children later in life or not at all. It is also worth noting some factors that put a person at a higher risk of developing breast cancer are interrelated. For example, a family history of the disease may be explained in part by genetics and in part by family members' similar modifiable habits.

Unmodifiable risk factors that majorly or moderately increase the risk of breast cancer include sex, age, breast density, lifetime exposure to estrogen, genetics, and family history. Being a woman and being 65 years old or older are both major risk factors. The risk of breast cancer also increases with increasing breast density; breast density is a factor that puts a woman at a moderately higher risk for disease (American Cancer Society, 2019a). Women with above average breast density have a 1.5- to 2- fold increased risk of breast cancer (Bertrand et al., 2013), and high breast density can make breast tumors undetectable on a mammogram (Boyd et al., 2007). Additionally, a higher lifetime exposure to estrogen may increase the risk of breast cancer, specifically breast cancer subtypes that are related to hormones. Moreover, postmenopausal women who

have naturally high levels of estrogen have about twice the risk of developing breast cancer compared to those with the lowest levels (American Cancer Society, 2019a).

Genetics as a breast cancer risk factor refers to the mutation in one or more genes. A mutation in the major breast cancer susceptibility genes, BRCA1 and BRCA2, significantly increases a woman's risk for breast cancer; a woman's risk of developing breast cancer by the age of 80 increases to 70% with a mutation (Kuchenbaecker et al., 2017). Family history is more complex as it refers to the genes, environment, and lifestyle factors that increase the risk of developing the disease, not just a mutation in a gene. Family history moderately increases a woman's risk of breast cancer (American Cancer Society, 2019a). Genetics and family history are interrelated; health professionals use family history to predict if someone has a gene mutation, but the family history of disease can also be unrelated to a genetic mutation. In fact, only 5% to 10% of breast cancer cases are linked to mutations in breast cancer susceptibility genes, BRCA1 and BRCA2, being passed down from a parent (Apostolou & Fostira, 2013). Similarly, less than 15% of women diagnosed with breast cancer have a family member with a history of the disease (Easton, 2002). The risk of developing breast cancer doubles for someone with one first-degree relative with breast cancer (American Cancer Society, 2019b), and the risk is even higher for someone with two or more first-degree relatives.

Modifiable risk factors, including physical inactivity, weight gain and obesity, and alcohol are minor contributors to the development of breast cancer (American Cancer Society, 2019a). Physical activity has been associated with risk reduction in

premenopausal and postmenopausal women (Pizot et al., 2016). Postmenopausal hormonal related-breast cancer risk is about 1.5 to 2 times higher for women who are overweight or obese (Jiralerspong & Goodwin, 2016) because heavier women tend have higher blood estrogen levels (Key et al., 2011). Additionally, efficacy of treatment in obese patients is much lower due to complications and increased risk for local recurrence (Lee et al., 2019). A pooled analysis of over 53 studies investigating alcohol's relationship to breast cancer found about a 7 percent increase in relative risk for every additional alcoholic drink consumed on a daily basis (Collaborative Group on Hormonal Factors in Breast Cancer, 2002). Overall, about one-third of postmenopausal breast cancers are attributed to modifiable risk factors, suggesting that many breast cancer cases are preventable (Tamimi et al., 2016).

Risk-reducing behaviors, also known as preventive measures, are actions done by individuals to decrease the likelihood of developing or dying of a disease. According to the American Cancer Society, all women can minimize their risk of developing and dying of breast cancer by maintaining a healthy weight, exercising regularly, and limiting alcohol consumption (American Cancer Society, 2019a). Screening is also an important risk-reducing behavior for breast cancer. According to the American Cancer Society's screening guidelines, women with an average risk of breast cancer should receive annual mammograms from age 45 to 54, and women 55 and older should either continue screening annually or transition to biennially; women aged 40 to 44 should also have the opportunity to begin annual screening if they choose (Oeffinger et al., 2015). Screening has increased early detection of the disease, which has in turn reduced



mortality (American Cancer Society, 2019a). Women at an increased risk for breast cancer, such as those with a known gene mutation, may also benefit from earlier and more frequent screenings, estrogen-blocking medications, or a prophylactic mastectomy (American Cancer Society, 2019a).

### **Diabetes Background**

Diabetes mellitus is a group of diseases characterized by high blood glucose levels. Insulin, a hormone made by the pancreas, helps cells metabolize glucose from food into energy. There are three main types of diabetes: Type 1, Type 2, and gestational. Type 1 diabetes is the inability of the body to make insulin; in contrast, a person with Type 2 diabetes is making enough insulin, but the body is unable to properly use it. Gestational diabetes is the presence of high blood glucose levels during pregnancy, and it increases a woman's risk of developing Type 2 diabetes later in life (American Diabetes Association, 2004). Of the three types of diabetes, Type 2 is the most common, accounting for 90% to 95% of diabetes cases (Centers for Disease Control and Prevention, 2020). A similar condition, prediabetes, is characterized by elevated blood glucose levels beneath the Type 2 diabetes threshold.

According to the most recent estimates, approximately 8.6% of all adult women in the United States are living with diagnosed diabetes (Centers for Disease Control and Prevention, 2020). The most recent age-adjusted incidence rate for diabetes in American women was about 660 cases per 100,000. Additionally, prediabetes affected an estimated 47.1 million women in 2018, and 3.4 million American women were estimated to have diabetes and not know it (Centers for Disease Control and Prevention, 2020).

Diabetes is the seventh leading cause of death for women in the US (Centers for Disease Control and Prevention, 2019). There were 37,395 women with diabetes listed as the underlying cause of death in 2018 (Centers for Disease Control and Prevention & National Center for Health Statistics, 2020), but diabetes is often underreported as a cause of death because people with diabetes often have comorbidities that contribute to their death (Stokes & Preston, 2017). Diabetes is strongly associated with heart disease, which is the number one cause of death for both women and men. In fact, adults with diabetes are nearly twice as likely to die of heart disease or stroke as are people without diabetes (National Institute of Diabetes and Digestive and Kidney Diseases, 2017). Especially if left untreated, diabetes also substantially increases the likelihood of developing conditions such as kidney disease, nerve damage, eye damage, and foot ulcers (National Institute of Diabetes and Digestive and Kidney Diseases, n.d.). A Centers for Disease Control and Prevention study estimated a woman's lifetime risk of developing diabetes to be almost 40% (Gregg et al., 2014), but race, age, and other factors affect a woman's risk.

American Indians and Alaska Natives have the highest diabetes prevalence, and non-Hispanic Whites have the lowest (Centers for Disease Control and Prevention, 2020). The lifetime risk of diabetes is lowest in non-Hispanic Whites at 34%; non-Hispanic Black people and Hispanics have a 55.3% and 51.5% lifetime risk, respectively (Gregg et al., 2014). Moreover, American Indians and Alaskan Natives are three to four times more likely to die of diabetes than Whites (Espey et al., 2014). Lastly, age is a factor that contributes to a woman's risk of diabetes. Most new cases of diabetes occur

in people aged 45 to 64 (Centers for Disease Control and Prevention, 2020). Prevalence also varies by education level, a factor of socioeconomic status. The prevalence is 7.5% for those with more than a high school education compared to 13.3% for adults with less than a high school education (Centers for Disease Control and Prevention, 2020).

Diabetes prevalence in adults continues to slowly increase, but incidence has begun to decrease (Benoit et al., 2019; Centers for Disease Control and Prevention, 2020).

However, the incidence of diabetes in those under the age of 20 continues to increase (Centers for Disease Control and Prevention, 2020).

The most common signs and symptoms of diabetes are increased hunger and thirst, fatigue, increased urination, blurry vision, and pain or numbness in the feet and legs. Treatment for diabetes involves controlling blood glucose levels, which helps prevent complications of the disease. Treatments may include diet changes, increased exercise, or daily medication.

For diabetes, as for breast cancer, there are both unmodifiable and modifiable risk factors. Unmodifiable risk factors for diabetes include race, age, family history, genetics, history of gestational diabetes, history of depression, and history of polycystic ovary syndrome (National Institute of Diabetes and Digestive and Kidney Diseases, 2016). Modifiable risk factors include inactivity, being overweight or obese, or having prediabetes. Notably, some modifiable risk factors may not be modifiable for all women. For example, women with other health issues may have trouble maintaining a healthy weight.

According to the American Heart Association, modifiable risk factors that majorly increase a woman's risk of developing diabetes include weight and physical inactivity (American Heart Association, 2015). Unmodifiable risk factors that moderately increase a woman's risk of developing diabetes include family history, genetics, and age. Someone with a first degree relative with type 2 diabetes has a twofold risk of developing diabetes (Cederberg et al., 2015). The American Diabetes Association suggests that type 2 diabetes has a strong genetic component based on a study of twins where approximately 70% of the identical twins in the study both had type 2 diabetes, compared with 20 to 30% of the fraternal twins (American Diabetes Association, n.d.; Kaprio et al., 1992).

According to the American Diabetes Association, one can minimize one's risk of developing diabetes by maintaining a healthy weight, eating a healthy diet, and having an active lifestyle (National Institute of Diabetes and Digestive and Kidney Diseases, 2016). Screening is also a recommended risk-reducing behavior. Common diabetes screening tests include a fasting plasma glucose test, which measures the glucose levels in the blood after at least an eight-hour fast, and a hemoglobin A1C test, which determines one's average blood glucose levels for the past two to three months without fasting. Even though screening does not reduce the mortality from type 2 diabetes (Pippitt et al., 2016), it leads to earlier detection and treatment, thus lessening the likelihood of developing complications of uncontrolled diabetes such as blindness and kidney failure. Moreover, screening is helpful for detecting prediabetes. Oftentimes, a person can prevent the progression of prediabetes to type 2 diabetes by instituting

moderate lifestyle changes (Tuso, 2014). The US Preventive Services Task Force’s most recent screening guidelines for diabetes says that overweight or obese adults aged 40 to 70 years old should be screened for abnormal blood glucose, and rescreening is suggested every three years for those with normal blood glucose (Siu, 2015).

A summary and comparison of some of the notable breast cancer and diabetes characteristics appears in Table 1.

**Table 1** Comparison of Breast Cancer and Diabetes Characteristics

		<b>Breast Cancer</b>	<b>Diabetes</b>
US Statistics	Prevalence	3.8 million <sup>a</sup>	12.8 million <sup>b</sup>
	Annual Incidence	268,600 cases <sup>a</sup>	738,000 cases <sup>b</sup>
	Mortality (per 100,000)	19.7 <sup>c</sup>	16.8 <sup>c</sup>
	Lifetime Risk	12.8% <sup>a</sup>	39.6% <sup>d</sup>
Nonmodifiable Risk Factors <sup>a,c</sup>	Age	Yes	Yes
	Family history	Yes	Yes
	Genetics	Yes	Yes
	Dense breast tissue	Yes	No
	Depression	No	Yes
	Polycystic ovary syndrome	No	Yes
	History of heart disease/stroke	No	Yes
Modifiable Risk Factors <sup>a,e</sup>	Overweight / Obesity	Yes	Yes
	Physical inactivity	Yes	Yes
	Alcohol	Yes	No
	Hormone replacement therapy	Yes	No
	High blood pressure	No	Yes

a-source: (American Cancer Society, 2019a)

b-source: (Centers for Disease Control and Prevention, 2020); Estimates from 2018

c-source:(Centers for Disease Control and Prevention & National Center for Health Statistics, 2020); Age-adjusted

d-source: (Gregg et al., 2014)

e-source: (National Institute of Diabetes and Digestive and Kidney Diseases, 2016)

## **Awareness, Risk Perceptions, and Social Stigma**

Despite the increase in availability of digital media, traditional media sources of information such as newspapers, books, and magazines have not been entirely replaced (Jacobs et al., 2017; Longo et al., 2009; Longo et al., 2010). In a focus group-based study of 46 people with diabetes, participants identified the internet, books, brochures, and magazines as important sources of diabetes management information (Longo et al., 2010). Additionally, a study compared the characteristics of people (age, education, health status, etc.) with where they sought health information and found being older and having lower socioeconomic status were associated with being users of traditional media such as magazines (Jacobs et al., 2017). However, oftentimes, rather than actively looking for medical information in the media, women may come across relevant health information while looking in the media for other purposes such as entertainment or political information. In fact, in a survey of 155 breast cancer patients, 64.7% of respondents indicated that they came across breast cancer information in magazines without actively seeking it (Longo et al., 2009).

In communication research, the agenda-setting theory describes the ability of the media to influence the importance the public ascribes to certain topics (McCombs & Shaw, 1972). People are exposed to what the media chooses to report on whether through passive receipt of information or health information-seeking behavior. By excluding, emphasizing, or elaborating on certain topics, the media influences what people think about and how they think about it (McCombs & Shaw, 1972). Therefore, the media can influence public awareness, risk perceptions, and social stigma concerning

health topics, and these concepts may be quite interrelated. In other words, each may stem from and contribute to one another.

### **Awareness**

The overall awareness of breast cancer and support for combatting it are greater than those for diabetes. Breast cancer did not become well-known overnight; the disease was once a taboo subject, but over time awareness has increased drastically (Braun, 2003). The pink ribbon became the symbol of breast cancer awareness in the 1980s and the symbol rapidly gained popularity (Susan G. Komen), and October is well known as Breast Cancer Awareness Month. A lesser-known symbol, the blue circle, was first officially used to represent diabetes in 2006 (International Diabetes Federation, n.d.), and November is National Diabetes Month. Despite efforts to increase awareness of diabetes with movements such as an official symbol and a month dedicated to awareness, diabetes has yet to reach the same visibility as breast cancer.

Moreover, funds raised for breast cancer are greater than those raised for diabetes, which is a good indicator of the disparity seen in public support. In 2018, Susan G. Komen, the leading breast cancer foundation, had a total of over 190 million dollars in revenue, which included about 175.5 million dollars from contributions and special events (Susan G. Komen, 2018). In contrast, the American Diabetes Association had about 160 million dollars in revenue, but only about 125 million dollars was from contributions, grants, and special events (American Diabetes Association, 2019). A stark difference existed in the money raised by these organizations at their special events. Susan G. Komen hosts Komen Race for the Cure and Komen 3-Day, which are events to

raise funds and promote awareness for breast cancer. In 2018, Susan G. Komen raised over 94 million dollars at these events (Susan G. Komen, 2018). The American Diabetes Association hosts Tour de Cure, a cycling event, and Step Out Walk to Stop Diabetes, which are events to raise funds and promote awareness for diabetes. In 2018, the American Diabetes Association raised about 19.5 million dollars at these events (American Diabetes Association, 2019). The difference in support may stem from and contribute to the awareness of both causes, and overall, the awareness and support may contribute to risk perception.

### **Risk Perception**

Risk perception, or the way an individual views a potential hazard, affects which threats people find significant and what actions, if any, they take to mitigate those threats. Overall, the public's risk perception of breast cancer and diabetes differ. Women often overestimate the risk of developing and dying from breast cancer (Wang et al., 2009; Woloshin et al., 1999). Oppositely, people underestimate their risk of developing diabetes (Heidemann et al., 2019; Kowall et al., 2017; Wang et al., 2009).

David Ropeik, an expert on risk perception, described 14 factors that affect a person's perception of risk; some notable factors include overall awareness of the risk, perception of control over the risk, and trust in the source of information (Ropeik, 2002). For example, a person may be unafraid of a disease because they think that it would never happen to them, unafraid of driving because they feel they are in control of the car, or a person may be fearful of a disease because they recently read a news story about it from trusted source. Moreover, the Health Belief Model (HBM) supports the



notion that the health behaviors people choose to participate in are often influenced by their perception of risk. The HBM identifies four key components to achieve optimal behavior change: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Champion & Skinner, 2008). For health behavior to change, a person must believe they can possibly be diagnosed with the disease, that the consequences of having the disease would be detrimental, that the behavior change to reduce the disease threat is beneficial, and that they can overcome barriers to achieve the benefits. These components of the HBM are considered essential to target in health messages to achieve optimal behavior change (Champion & Skinner, 2008).

In a survey of over 2,000 adults about their perceptions of chronic diseases including heart disease, diabetes, breast cancer, and other cancers, women were most concerned about and perceived themselves at the greatest risk for breast cancer (Wang et al., 2009). Moreover, Woloshin et al. (1999) surveyed women about their perceived risk of dying of breast cancer within ten years, compared their response to the actual risk of an average woman her age, and found that almost all the respondents overestimated their risk; half of the respondents overestimated by eightfold or more.

A survey on diabetes-related knowledge in over 2,000 adults without known diabetes was conducted, and responses were compared with the individual's actual diabetes risk; most participants perceived their risk of diabetes to be low, even if they were of high risk for diabetes (Heidemann et al., 2019). In a similar study, almost 2,000 participants without diagnosed diabetes were asked about their perceived probability of having the disease before being screened for the disease. About three-quarters of the

people who had diabetes upon screening believed their likelihood of having the disease was low or very low (Kowall et al., 2017). Lastly, in a survey about the perceptions of chronic diseases including heart disease, diabetes, breast cancer, and other cancers, people regarded diabetes as the disease they were least concerned with; they did so despite diabetes' association with heart disease, which women regarded as the second most concerning disease after breast cancer (Wang et al., 2009).

### **Social Stigma**

Stigma refers to a disadvantageous social judgment based on a feature of a disease that may lead to perceived or experienced negative feelings or status loss (Browne et al., 2013; Trusson & Pilnick, 2017). In other words, people with conditions bearing stigma may tend to feel shame or ostracism. Both breast cancer and diabetes patients often report feelings of stigma. Although breast cancer is well known and patients often report plenty of initial support, the feelings women have about treatment and remission are often contradicted by societal pressures to remain positive (Powers et al., 2016; Trusson & Pilnick, 2017). Diabetes patients often feel blamed for the development of the disease and rejected by others because of their condition (Browne et al., 2013; Liu et al., 2017).

Breast cancer patients often face emotional distress from the impact of the disease on their relationships with friends and family (Trusson & Pilnick, 2017). In a study of 24 breast cancer patients between 6 months and 29 years post-diagnosis, women described the strain that diagnosis had on relationships, which often ended in the loss of relationships with close friends and family members (Trusson & Pilnick, 2017). The

women often described how the people in their life were unsure how to handle their diagnosis and thus would either disappear or cause distress in the relationship. Other women in the study felt pressure to move on and return to their normal life before diagnosis, so they felt they had to be positive and hide their true emotions to not risk losing support from loved ones (Trusson & Pilnick, 2017). Moreover, many breast cancer patients felt pressure to be positive and embrace wellness upon remission, yet women who experience remission are often fearful of recurrence (Powers et al., 2016). In a study consisting of interviews with nine women who had received breast cancer treatment, several of the women reported having mixed feelings of being considered healthy because they were always anxiously waiting for the next appointment and test result to confirm the cancer had remained in remission (Powers et al., 2016). Breast cancer patients often feel stigmatized because of societal expectations to be a survivor who has beaten cancer (Powers et al., 2016).

Because diabetes is majorly related to modifiable risk factors, diabetes patients often feel blamed for developing their condition, which often stems from public misunderstanding of the disease. Many people affected by diabetes report feelings of rejection or exclusion (Liu et al., 2017) and an unwillingness to open up about their condition with others (Browne et al., 2013). In one study, 12,000 people with diabetes were surveyed, and 52% of participants indicated they felt diabetes is accompanied with stigma (Liu et al., 2017). The most reported experiences of stigma were being blamed by others for causing their own diabetes through lifestyle choices and being a burden on the healthcare system (Liu et al., 2017). Another study was conducted using semi-structured

interviews with 25 adults with diabetes to determine their perception and experiences of diabetes-related stigma (Browne et al., 2013). Most participants (84%) indicated that they felt diabetes is accompanied with stigma, and the most common experiences of stigma included feeling blamed by others for causing their condition, negative stereotyping, and being discriminated against. One woman in Browne's study (2013) even called diabetes the "blame and shame disease" because according to her, others' belief that diabetes patients are to be blamed for developing the disease causes feelings of hopelessness.

### **Previous Studies of Breast Cancer and Diabetes Media Coverage**

Breast cancer media coverage has been studied extensively, while a few studies have examined the portrayal of diabetes in the media. The breast cancer studies have examined the amount of coverage, accuracy of the articles, framing and themes, and characteristics of the articles. The few studies that have investigated diabetes in the media have looked at the accuracy and framing of the diabetes-related information. To my knowledge, there are no current studies comparing magazine coverage of breast cancer and of diabetes.

Some studies about breast cancer media coverage have investigated the amount of coverage relative to incidence and mortality (Jensen et al., 2010; Marino & Gerlach, 1999; Slater et al., 2008). Other studies have analyzed the accuracy of information contained in magazine articles (Walsh-Childers et al., 2011; Walsh-Childers et al., 2012). Qualitative characteristics (e.g., framing and themes) of breast cancer coverage have been explored in other studies (Andsager & Powers, 1999; McWhirter et al., 2012).

Lastly, some studies have taken a more quantitative approach to investigate characteristics such as the percentage of articles mentioning particular disease risk factors (Marino & Gerlach, 1999; Reyes, 2005; Walsh-Childers et al., 2011; Walsh-Childers et al., 2012).

Breast cancer is one of the most covered diseases in the media. In a study of the news coverage of cancer in US newspapers, television, and magazines, breast cancer was covered the most of any type of cancer in all three media outlets, which overrepresented the contribution of the disease to mortality and incidence rates at the time (Slater et al., 2008). In a study of over 5,000 cancer-related articles, breast cancer was overreported in the top 50 US newspapers relative to the incidence (Jensen et al., 2010). Moreover, Marino and Gerlach (1999) found that breast cancer was the focus of about 35% of the over 500 articles published from 1987 to 1995 in the seven magazines included in the study, which was higher than both the female cancer mortality and overall female mortality at the time.

Although breast cancer is one of the most covered diseases in the media, the information the media includes is not always accurate. In a study of 555 breast cancer articles in 17 high-circulating magazines, most were found to be missing what an expert panel deemed key facts; only 7 of 33 key facts were mentioned in at least 5% of the articles (Walsh-Childers et al., 2011). However, of key facts that were included, most were deemed accurate except for those regarding the link between hormone replacement therapy and breast cancer (Walsh-Childers et al., 2011). A smaller but similar study found that information was not always accurate in magazines popular among Black

women; information on racial disparities and screening recommendations was often not entirely accurate, if included at all (Walsh-Childers et al., 2012).

As for characteristics of the breast cancer coverage, both qualitative and quantitative studies exist. Qualitative studies have included investigating the framing, themes, and tone of breast cancer articles. Andsager and Powers (1999) found that women's magazines were likely to use social frames, such as coping with the disease and personal experiences, whereas news magazines tended to frame breast cancer as an economic issue, focusing on insurance and research funding. Similarly, McWhirter et al. (2012) investigated the tone and themes seen in images and text contained in Canadian women's and health magazines and concluded that the breast cancer messages may be misleading. The most common theme of images contained in the articles was beauty or fashion (e.g., depiction of the body, clothing, or makeup), but the most common theme of the articles was medical (e.g., mention of treatment or testing), which the researchers described as divergent messaging (McWhirter et al., 2012).

Quantitative studies of breast cancer coverage have tended to focus on features such as coverage of risk factors, disease statistics, and preventive behaviors. Notably, several studies have found that risk factors for breast cancer such as age, genetics, and family history were not discussed proportionally to their contribution to the development of the disease. Although age is one of the most important risk factors for breast cancer, studies have found that the personal stories included in breast cancer articles were mainly about younger women (Marino & Gerlach, 1999; Reyes, 2005), and one study found a similar trend in images contained in breast cancer articles (McWhirter et al.,

2012). Reyes (2005) found that only one out of 105 articles analyzed included a story of an older breast cancer patient, and Marino and Gerlach (1999) found that the ages of diagnosis of the women in the articles were much lower than the median age of diagnosis for the disease at the time. McWhirter et al. (2012) found that most images were of young, White women with a healthy body weight and intact breasts, and the physical impact of breast cancer treatment (e.g., hair loss) was depicted in almost none of the images. Instead of age, studies found that risk factors such as family history and genetics were discussed the most (Reyes, 2005; Walsh-Childers et al., 2011; Walsh-Childers et al., 2012). In fact, Walsh-Childers et al. (2011) found that family history was twice as likely to be discussed as a risk factor as was age.

Diabetes media coverage has been investigated less, but a few notable studies have examined quantitative characteristics such as the number of newspaper articles (Rock, 2005), framing used in print media (Gollust & Lantz, 2009; Rock, 2005; Stefanik-Sidener, 2013), and characteristics of women's magazine articles such as the inclusion of prevalence, risk factors, and symptoms (Wallace, 2003). One study used quantitative methods to investigate the number of articles in two major Canadian newspapers that mentioned diabetes, heart disease, and death and qualitative methods to explore the framing of diabetes in the same Canadian newspapers and two major US magazines (Rock, 2005). The results of the quantitative portion of the study indicated that diabetes was often linked to heart disease and mortality to convey the disease as serious and newsworthy, and for qualitative results, diabetes articles had three common frames. Frames included diabetes as an insidious problem, as a problem for only a

particular population, or as a problem requiring medical treatment and further research (Rock, 2005). Another study looked for the presence of three frames (behavioral, medical, and societal) in a little over 200 diabetes articles appearing in the New York Times from 2000 to 2010 (Stefanik-Sidener, 2013). The author found the most common frames were the behavioral frame (articles referencing diet, lack of physical activity, and other personal-level issues) and the medical frame (articles referencing family history, genetics, and medical solutions to the disease). Moreover, the author concluded that a lack of a societal frame (articles referencing poor food environments, poor nutrition in school, and societal-level solutions) made it difficult for the public to see the wider consequences of diabetes and support diabetes public policy (Stefanik-Sidener, 2013). Similarly, another study that looked at almost 700 US newspaper articles found that behavioral factors and obesity were the predominant frames used to explain diabetes, and individualized behavior changes and medical care were the predominant frames for addressing diabetes problems (Gollust & Lantz, 2009). Lastly, findings from a study of women's magazines from 1995 to 2001 suggested that the coverage devoted to diabetes did not reflect the public health problem that the disease poses to society because prevalence, risk factors, symptoms, preventive measures, and long-term complications were not discussed in detail (Wallace, 2003). The authors of these studies investigating diabetes coverage in the media suggested that more accurate and well-rounded diabetes information should be disseminated to the public.

Lastly, some studies compared breast cancer or diabetes media coverage to the coverage of other diseases. One study compared characteristics of breast cancer and



heart disease coverage, including themes, in Canadian media and found breast cancer to have far more coverage (Champion et al., 2016). Moreover, the researchers found breast cancer had more former breast cancer patients as a source of information, fewer risk statistics, fewer mentions of preventive behaviors, and more human-interest stories than heart disease articles. Additionally, thematic analysis revealed themes of young, White women fighting the disease with a positive transformation as a survivor; oppositely, heart disease themes focused around individual responsibility for the disease and had a shameful tone (Champion et al., 2016). Another study compared diabetes and heart disease risk messages in newspapers (Peinado, 2008). The results of the study indicated that most of the articles did not portray a sufficient level of threat, and thus were unlikely to motivate people to reduce the threat because the articles lacked one or more of the four components of health risk messages: severity, susceptibility, response efficacy, and self-efficacy. Moreover, the diabetes articles were more likely than the heart disease articles to include prevalence and risk factors and to single out particular populations for being at risk (Peinado, 2008). Comparative studies such as these allow for a clear juxtaposition of two diseases' media coverage. Yet, to my knowledge, nobody has compared the coverage of breast cancer and diabetes in US women's magazines. In the current study, I directly compared the coverage of the breast cancer and diabetes by expanding on what researchers have found regarding the coverage of the diseases separately.

## **Research Objectives**

For this thesis, I compared breast cancer and diabetes coverage in the top five US women's magazines from January 2015 through December 2019. The research objectives were the following:

1. To determine whether a difference in amounts of coverage existed between breast cancer and diabetes in popular women's magazines from 2015 through 2019
2. To characterize the differences, if any, between the content covered within breast cancer and diabetes articles in popular women's magazines from 2015 through 2019

Overall, the goal of the research was to compare the coverage of diabetes with that of breast cancer to provide insight into how the magazines may contribute to increased public recognition of diabetes as a serious health concern.

## CHAPTER II

### RESEARCH METHODOLOGY

I used content analysis to accomplish the research objectives, which were to determine whether a difference existed in amounts of coverage of breast cancer and diabetes in popular US women's magazines from 2015 through 2019 and characterize the differences, if any, between the content covered within the articles. Content analysis is a systematic research technique used to determine the existence of certain words or concepts within texts, and the data are used to make inferences (Krippendorff, 2004). By describing the content and thus the messages of the articles (Neuendorf, 2016), content analysis was used in this study to compare breast cancer and diabetes coverage in popular US women's magazines.

#### **Magazine Selection**

The coverage of breast cancer and diabetes from 2015 through 2019 was compared in the five US women's magazines with the highest circulation rates in the June 2019 Alliance for Audited Media report (Table 2). To be included in this study, the women's magazine had to be published monthly and have a regularly occurring health section. Health and fitness magazines were excluded to ensure that all the selected magazines had a similar likelihood of including breast cancer and diabetes related articles. Using the criteria above, the five women's magazines chosen for this study were *Better Homes and Gardens*, *Good Housekeeping*, *The O*, *Family Circle*, and *Woman's Day* (Table 2).

**Table 2** Alliance for Audited Media June 2019 Women’s Magazines Circulation Averages and Status of Inclusion in Study

	<i>Total Paid Circulation</i>	<i>Included / Excluded</i>
<i>Better Homes and Gardens</i>	<b>7,635,348</b>	<b>Included</b>
<i>Good Housekeeping</i>	<b>4,222,672</b>	<b>Included</b>
<i>Family Circle</i>	<b>4,025,829</b>	<b>Included</b>
<i>People</i>	3,458,034	Excluded: Weekly
<i>Woman’s Day</i>	<b>3,127,875</b>	<b>Included</b>
<i>Cosmopolitan</i>	2,717,942	Excluded: No Health Section
<i>Shape</i>	2,503,794	Excluded: Fitness-focused
<i>The O</i>	<b>2,278,871</b>	<b>Included</b>

All five magazines included in the study had 12 issues per year except for *Woman’s Day*. Although *Woman’s Day* is considered a monthly magazine, beginning in August 2015 issues were no longer published in January and August, resulting in only 10 issues a year. Although outside the timeframe of the current study, *Good Housekeeping* also began publishing only 10 issues a year beginning in 2020. Additionally, *Family Circle* ceased publication indefinitely after their December 2019 issue. Lastly, *The O* is also ending its print edition of the magazine after 2020.

The median age of *Woman’s Day* and *Good Housekeeping* readers is around 60 years (Good Housekeeping, 2020; Woman's Day, 2020). The median age of *Better Homes and Gardens* and *The O* readers is closer to 55 years (Better Homes and Gardens, 2020; The O, 2018). The percentages of *Woman’s Day*, *Good Housekeeping*, and *Better Homes and Gardens* readers who are women are 94.8%, 87%, and 80%, respectively. The median household income for *The O* readers is greater than the other magazines’ readers at around \$80,000 (The O, 2020). The median household incomes for readers of *Woman’s Day*, *Better Homes and Garden*, and *Good Housekeeping* are \$64,000,

\$69,000, and \$70,000, respectively. Because *Family Circle* ceased publication in 2019, recent readership information was no longer available for the magazine. However, past readership information from 2013 and 2017 indicates that the magazine's readership was consistently over 80% female and the median of age of readers was between 50 to 55 years (Family Circle, 2013, 2017), making the magazine appropriate for this study.

### **Article Selection**

From the selected magazines, the articles were retrieved for analysis from an indexing database, MasterFILE Complete. In addition to providing full-text access to the magazines chosen for this study, MasterFILE Complete includes publication information (month, year, volume, and issue of publication), word count, number of images, the range of the pages the article appears on, and the page count of the article (as precise as one-ninth of a page).

After accessing the database, I used the "advanced search" tab to narrow the search results to the date range of the study, one of the five magazines, and the targeted subject matter. Either breast cancer or diabetes related articles were targeted by searching "breast cancer" in quotation marks or "diabet\*." A \* was used to pull articles with word variants such as diabetic. For example, an advanced search was conducted using "*Better Homes and Gardens*" AND "breast cancer" for January 2015 through December 2019. This search method was repeated for each magazine for breast cancer and again for diabetes. Because *Woman's Day* has an Australian version and a US version, an additional search condition (NOT "Australia edition") was used to ensure that the study included only US issues. To test the reliability of the MasterFILE

database, I manually selected articles from *Better Homes and Gardens*, *Good Housekeeping*, and *Woman's Day* for July 2017 through December 2017 to ensure that the database resulted in a complete set of articles; the manual selection matched the database for the selected magazines and time period.

Each article obtained by the methods described above was first read entirely to determine the article's eligibility in the study. To be included, the article had to focus on any type of breast cancer or diabetes in adults. If "diabetes" appeared in an article that focused on another type of disease or was about diabetes in children or animals, the article was not included. Lastly, an article was excluded if it was a letter to the editor or an advertisement, because this study aimed to compare content created by magazine staff or commissioned by the magazine.

The MasterFILE Complete database indexes four of the five magazines for the entire chosen time period. *Family Circle* is indexed only for 2017-2019; therefore, the remaining two years (24 issues) were obtained from the Austin Public Library and reviewed from cover to cover to determine eligibility of articles. An article was considered for the study if it mentioned "breast cancer" or "diabetes," and it was included for analysis if it met all the criteria noted above.

### **Coding**

As the primary coder, I coded all the articles in the dataset. The articles were read three times to allow for specific aspects of the article to be systematically focused on during each read. The full codebook, with definitions and categories, appears in Appendix A.

Before an article was read, basic information was recorded directly from the source information provided by MasterFILE Complete. This basic information included:

- Title of the article
- Publication month and year
- Volume and issue of the magazine the article appears in
- Page range of the article
- Page count of the article
- Word count

I also answered ‘yes’ or ‘no’ to the following questions about the prominence of the article before reading it:

- Is the disease mentioned in the title of the article?
- Is the disease mentioned in the deck, if the article has one?
- Is the disease mentioned in any subheading(s) within the article, if the article has any?
- Is the article mentioned on the cover of the issue?
- If the article is mentioned on the cover of the issue, is it the main feature story?
- Does the article appear in the health section of the magazine?

On the first read, I examined the following article characteristics:

- Does the article identify risk factors? If so, which one(s)?
- Does the article identify risk-reducing behaviors? If so, which one(s)?
- Does the article identify signs and symptoms of the disease? If so, which one(s)?
- Does the article mention treatment?
- Does the article mention prognosis?

On the second read, I answered ‘yes’ or ‘no’ to the following questions about characteristics of the articles:

- Does the article mention incidence?
- Does the article mention prevalence?
- Does the article mention mortality?
- Does the article discuss research (e.g. research studies)?
- Does the article include a story of a current or former patient with the disease?

I read the article a third time, coding for the sources of information and for resources from which readers could seek further information. Specifically, I identified sources of information including doctors or other health professionals, scientific studies, organizations, current or former patients, and friends or family of current or former patients. Examples of resources include a suggestion to call a doctor or visit a website of a government agency or non-profit organization. The following data was collected:

- How many sources of information, pertaining to the disease, are identified in the article?
- What sources of information are identified?
- Does the article refer readers to further resources?

The information that was sourced from people (e.g., health professionals) was coded as they were identified in the article, regardless of their actual post-nominal titles or job title. For example, if an article identified a person as James Smith, MD, then the source of information was coded as such, regardless if James Smith, MD also has a PhD. Unless it was otherwise clearly stated, any use of “Dr.” before a person’s name was coded as a physician.

Additionally, sources of information on other topics (e.g., a quote about heart disease in an article focused on diabetes) were not included as identified sources of information. More than one quote from the same person counted only as one identified source. However, information from a study and a quote from a researcher from the same study counted as two separate sources of information.

Finally, I focused on the images contained in the article. Coding characteristics of images in this study was important because images may be seen even when text is not



read, and images make people pay greater attention (Paivio, 2013). MasterFILE Complete indicates the number of images contained in the articles; this helped determine which images to analyze (i.e., images contained in adjacent advertisements were not analyzed). I collected the following data:

- How many images, if any, are contained in the article?
- What content is depicted in the image(s) contained in the article?
- If the article contains image(s) with a person/people, who are the subjects in the images?
- What proportion of the page does the image(s) cover?

### **Pilot Study**

A pilot study was conducted to determine the feasibility of the study and the suitability of the codebook. In this pilot study, magazine articles from January 2008 through December 2008 were analyzed. Magazine articles from this timeframe were chosen because I originally planned to investigate articles from 2014 through 2018 in the full-scale study and wanted to be able to extend the timeframe back five more years to 2009 if more data was needed. Based on availability during the chosen timeframe, three of the magazines from the full-scale study were used in the pilot study: *Better Homes and Gardens*, *Good Housekeeping*, and *The O*. A total of 13 breast cancer articles and five diabetes articles were included in the pilot study based on the inclusion criteria of the full-scale study.

Because the codebook required answers that were objective (e.g., questions calling for an answer of yes or no), reliability was not a major concern. However, to help identify any potential problems for the full-scale study, a second coder (independent of the study) was consulted during the pilot study. Using a random number generator, 20%

of the breast cancer articles (n = 3) and 20% of the diabetes articles (n = 2) were given to the second coder to analyze. The second coder was provided the articles, codebook, and data sheet used by the primary coder.

Based on the pilot study and consultation with the second coder, a few elements of the codebook were modified. Modifications included eliminating some questions that did not directly relate to the research objectives and adding some questions that helped address the research objectives more effectively.

## CHAPTER III

### RESULTS

The research objectives of the study were to determine whether a difference in amounts of coverage existed between breast cancer and diabetes in popular women's magazines and to characterize the differences, if any, between the content covered within the articles. Overall, the results showed that the amount of coverage was greater for breast cancer than diabetes. Both notable differences and similarities were observed regarding the content covered within the magazines. This chapter will first present the differences will be discussed, which notably regarded the identified risk factors and risk-reducing behaviors, number and size of images contained in the articles, identification of prevalence, discussion about treatment, and the use of current or former patients and research as sources of information. A section devoted to similarities appears toward the end of this chapter; notable similarities regarded the percentage of articles that were published during the diseases' respective awareness month, discussion about prognosis, and identification of signs or symptoms, mortality, and incidence.

#### **Amounts of Coverage**

For this study, three measures were used to determine if a difference existed between the amounts of coverage for breast cancer and diabetes in popular US women's magazines: total number of articles, word counts, and page counts. Overall, more articles, words, and pages were devoted to breast cancer than diabetes. *Better Homes and Gardens*, *Good Housekeeping*, *Family Circle*, and *The O* devoted more articles to breast

cancer than diabetes. *Woman’s Day* devoted the same amount of coverage to each disease.

A total of 129 articles in the magazines mentioned “breast cancer” or “diabetes.” However, 72 of the 129 articles did not meet the inclusion criteria, for the following reasons: not focusing on the disease of interest (n = 68), being book reviews (n = 3), and being a letter to the editor (n = 1). The articles that did not focus on the disease of interest instead focused on topics such as other diseases, benefits of a certain diet or exercise, or shopping that benefits breast cancer charities.

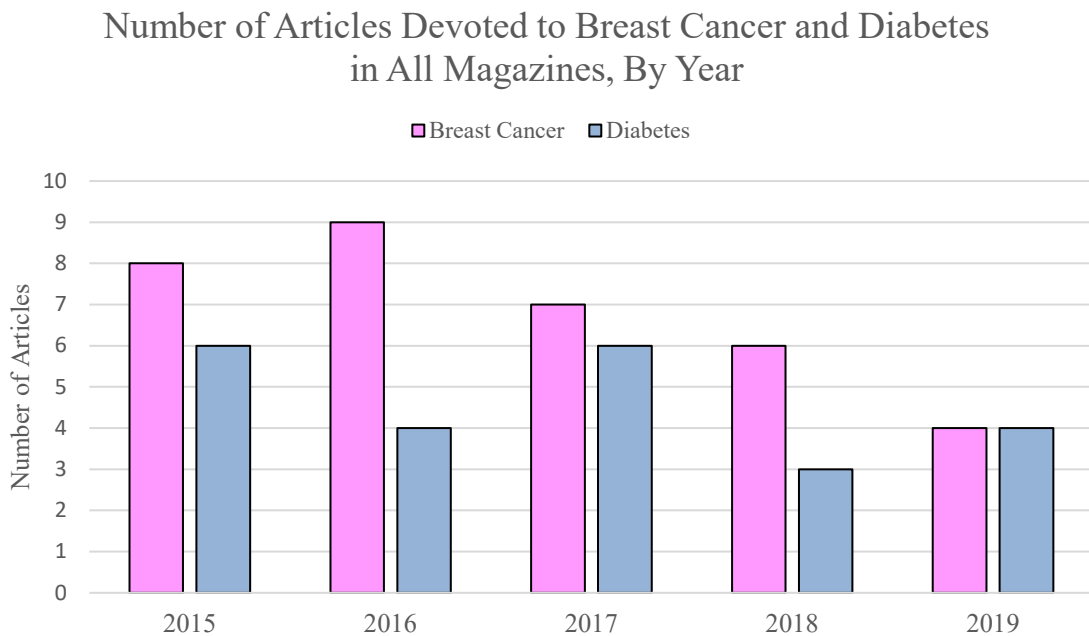
Table 3 summarizes the amounts of coverage devoted to each disease. More breast cancer articles than diabetes articles were included in the study. In total, considerably more words were devoted to breast cancer than diabetes, and the median word count of breast cancer articles was more than double that of diabetes articles. Additionally, 3.5 times as many pages in total were devoted to breast cancer as to diabetes (Table 3).

**Table 3** Summary of Amounts of Coverage of Breast Cancer and Diabetes

	<i><b>Total</b></i>	<i><b>Median</b></i>	<i><b>Minimum</b></i>	<i><b>Maximum</b></i>
<i><b>Articles</b></i> (Breast Cancer)	34	-	-	-
<i><b>Articles</b></i> (Diabetes)	23	-	-	-
<i><b>Word Count</b></i> (Breast Cancer)	42,557	976	98	4,227
<i><b>Word Count</b></i> (Diabetes)	13,459	460	105	2,157
<i><b>Page Count</b></i> (Breast Cancer)	86	2	0.3	8
<i><b>Page Count</b></i> (Diabetes)	24	1	0.2	3.5

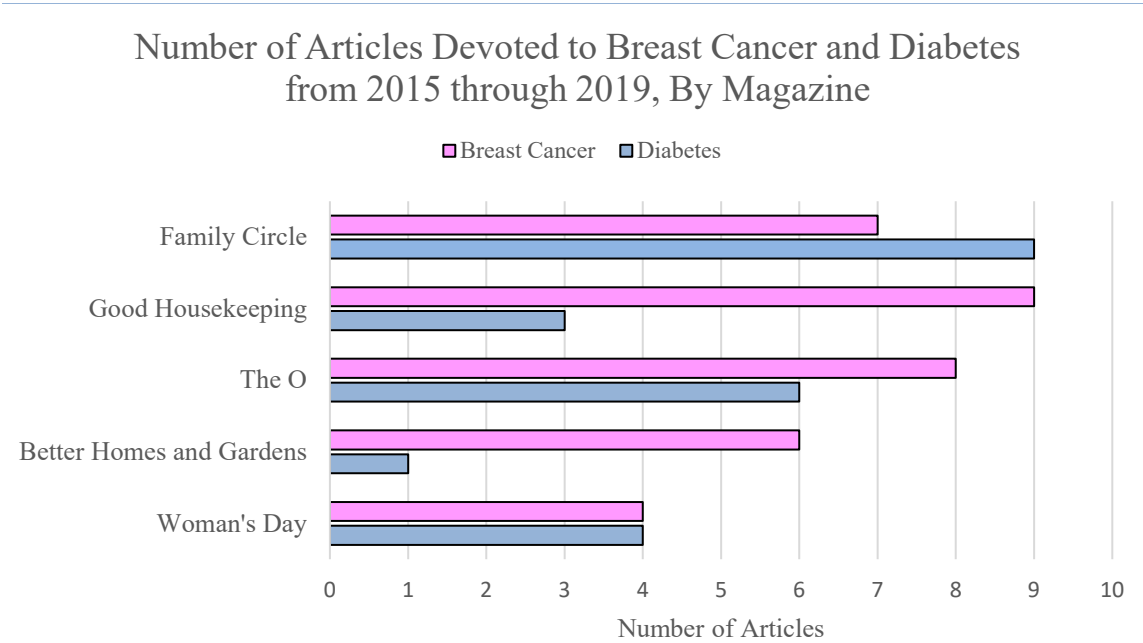
Eighteen percent of the breast cancer articles were less than a page long ( $n = 6$ ), and 26% ( $n = 9$ ) were one page exactly. Most breast cancer articles were greater than one page long (56%,  $n = 19$ ). In fact, about one quarter of the breast cancer articles were four pages or more (26%,  $n = 9$ ). Diabetes articles' page counts trended toward being smaller. Nearly half of the diabetes articles were less than a page (48%,  $n = 11$ ), and 30% of the articles were one page ( $n = 7$ ). Only 22% of the diabetes articles ( $n = 5$ ) were longer than a page. None of the diabetes articles were more than four pages long.

The amounts of coverage were also compared by year and by magazine, which appears in Figure 1. More breast cancer articles than diabetes articles existed in each of the five magazines in the study every year except 2019 (Figure 1).



**Figure 1** Number of Articles Devoted to Breast Cancer and Diabetes in All Magazines, by Year

For 2015 through 2019, the range for the number of breast cancer articles included in a single magazine was 4 to 9; for diabetes, the range was 1 to 9 (Figure 2). *Woman's Day* devoted the same number of articles to each of the diseases (n = 4), but a difference existed between the number of breast cancer and diabetes articles appearing in the other magazines (Figure 2). Most notably, *Better Homes and Gardens* and *Good Housekeeping* devoted six and three times as many articles to breast cancer as diabetes, respectively.



**Figure 2** Number of Articles Devoted to Breast Cancer and Diabetes from 2015 through 2019, by Magazine

## **Characteristics of Coverage**

Several characteristics of the magazine articles were examined to determine if a difference existed between breast cancer and diabetes magazine coverage, and notable differences were found. The identification of shared risk factors and risk-reducing behaviors, identification of prevalence, discussion about treatment, and the referral of readers to further resources differed. The number of images contained in breast cancer articles was greater than the number of images contained in diabetes articles. Lastly, the sources of information used, most notably the reference to research and inclusion of a current or former patient as a source, also differed between the two diseases. There were also some notable similarities, which will be noted in the last portion of this chapter.

### **Risk Factors and Risk-reducing Behaviors**

Overall, at least one risk factor was reported in a slightly greater proportion of breast cancer articles (62%,  $n = 21$ ) than diabetes articles (74%,  $n = 17$ ), but the differences resided in the specific risk factors identified. More diabetes articles than breast cancer articles identified at least one risk-reducing behavior, and differences existed in the specific risk-reducing behaviors identified by breast cancer and diabetes articles.

The percentage of articles that identified at least one unmodifiable risk factor, at least one modifiable risk factor, and both within the same article appears in Table 4. Of the articles that presented at least one risk factor, all the breast cancer articles identified at least one unmodifiable risk factor, whereas only about half of the diabetes articles did so (Table 4). Instead, diabetes article tended to identify more modifiable risk factors.

Few breast cancer and diabetes articles identified at least one unmodifiable and one modifiable risk factor within the same article (Table 4).

**Table 4** Percentage of Articles Identifying Unmodifiable and Modifiable Risk Factors

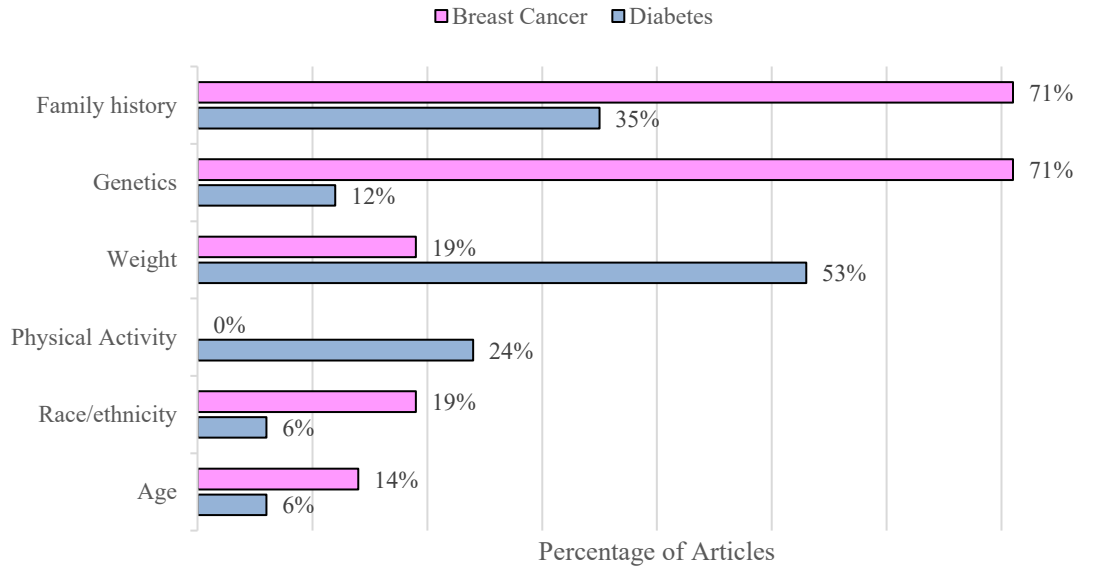
	<i>Breast Cancer (%*)</i>	<i>Diabetes (%*)</i>
<i>At least one unmodifiable risk factor</i>	21 (100%)	9 (53%)
<i>At least one modifiable risk factor</i>	7 (33%)	14 (83%)
<i>Both unmodifiable and modifiable risk factor</i>	7 (33%)	7 (41%)

\*The percentages were calculated using 21 and 17 as the denominator for breast cancer and diabetes, respectively. These denominators were the number of articles that identified at least one risk factor.

A full comparison of the percentage of articles identifying the diseases' shared risk factors appears in Figure 3. Breast cancer and diabetes coverage differed considerably in the percentage of articles that identified the shared risk factors between the diseases (family history, age, race/ethnicity, genetics, weight, and physical activity). For example, no breast cancer articles presented a lack of physical activity as a risk factor compared to about one quarter of the diabetes articles (n = 4). However, considerably more breast cancer articles than diabetes articles identified genetics as a risk factor for the diseases (Figure 3). Lastly, being overweight was presented as a risk factor in more diabetes articles (n= 9) than breast cancer articles (n = 4).



### Percentage of Articles Identifying Shared Risk Factors of Breast Cancer and Diabetes



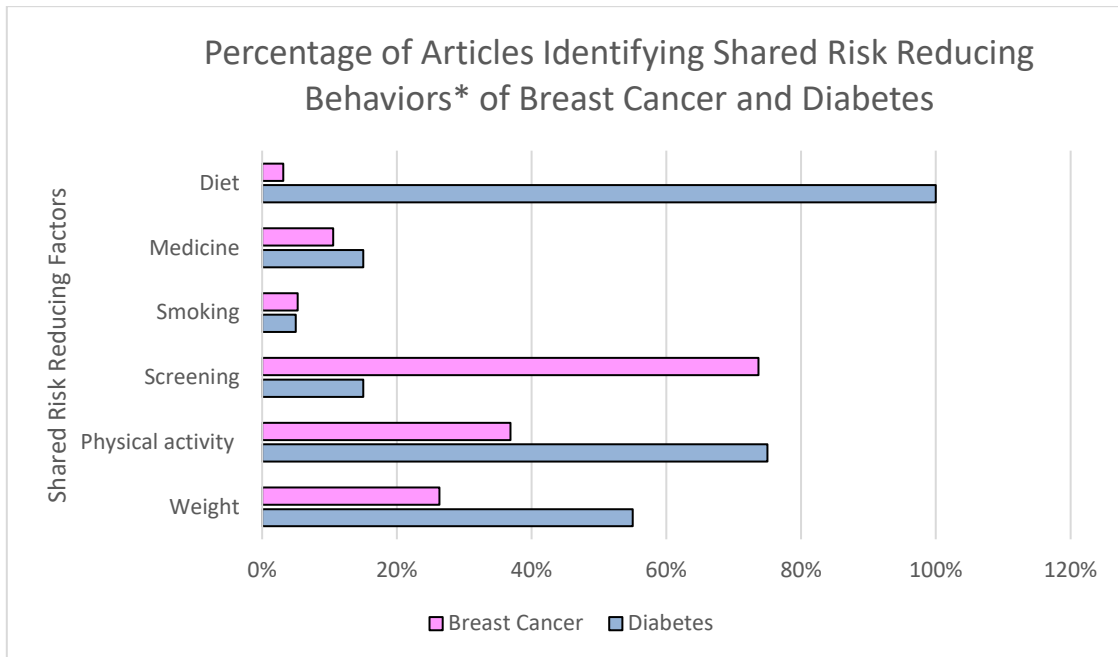
\*Shared risk factors are those identified by both the American Cancer Society and the American Diabetes Association as factors of risk for developing or dying of the diseases.

\*\*The percentages were calculated using 21 and 17 as the denominator for breast cancer and diabetes, respectively. These denominators were the number of articles that identified at least one risk factor.

**Figure 3** Percentage of Articles Identifying Shared Risk Factors of Breast Cancer and Diabetes

Fewer breast cancer articles (56%, n = 19) than diabetes articles (87%, n = 20) mentioned at least one risk reducing behavior. Like the risk factors, the risk reducing behaviors shared between the two diseases (diet, medication, screening, physical activity, and weight control) were compared (Figure 4). Notably, all the diabetes articles that mentioned at least one risk reducing behavior identified diet as a way for one to lower one’s risk of developing or dying of the disease. In contrast, only six breast cancer articles identified diet as a risk reducing behavior. Almost five times as many breast

cancer articles as diabetes articles identified screening as a risk-reducing behavior, and physical activity and weight control were both identified in a greater percentage of diabetes articles than breast cancer articles (Figure 4).



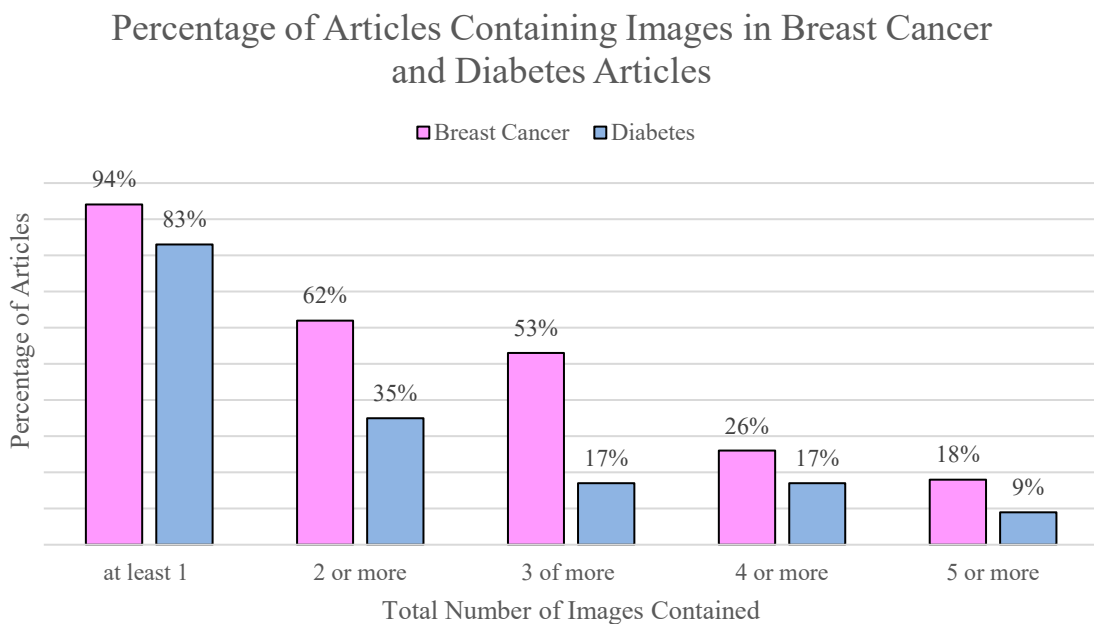
\*Shared risk-reducing behaviors are those identified by both the American Cancer Society and the American Diabetes Association as measures to reduce one’s risk of developing or dying of the diseases.  
 \*\*The percentages were calculated using 19 and 20 as the denominator for breast cancer and diabetes, respectively. These denominators were the number of articles that identified at least one risk-reducing behavior.

**Figure 4** Percentage of Articles Identifying Shared Risk-reducing Behaviors of Breast Cancer and Diabetes

### Images

The number of images, content depicted in the images, and the proportion of the page covered by each image were compared between breast cancer and diabetes articles,

and notable differences were found. There were a total of 96 images within the 34 breast cancer articles (median number of images per article = 3, range = 0–9), and there were a total of 39 images within the 23 diabetes articles (median number of images per article = 1, range = 0–6). The breakdown of the percentage of articles containing images in breast cancer and diabetes articles appears in Figure 5.



**Figure 5** Percentage of Articles Containing Images in Breast Cancer and Diabetes Articles

Additionally, the content depicted in the images in breast cancer and diabetes articles were compared. The most notable difference was the inclusion of a pink ribbon in almost half of the breast cancer articles (47%, n = 16). A reoccurring symbol did not

appear in the diabetes articles; however, food appeared in the images of almost half of the diabetes articles (48%, n = 11).

Images in diabetes articles tended to take up less space than images in breast cancer articles. Almost all the images contained in diabetes articles were less than half a page in size (n = 37, 95%), compared to only 78% of the breast cancer images (n = 75). One of the remaining two images in the diabetes articles was between half a page and one page, and the other was one page exactly. Eleven of the images contained in breast cancer articles were between half a page and one page (12%), and 10 of the images were one page exactly (11%).

### **Sources of Information**

The number and types of sources of information identified in breast cancer articles and diabetes articles were compared. Overall, the number of sources and type of sources used in breast cancer and diabetes articles were similar and will be discussed at the end of this chapter. However, notable exceptions included the use of research or a current or former patient as a source of information and some specific experts appearing more than once from article to article.

About half of all the breast cancer articles (53%, n = 18) and most of the diabetes articles (83%, n = 19) cited research as a source of information. Moreover, a little more than half of all the breast cancer articles (59%, n = 20) and only 17% of the diabetes articles (n = 4) included a current or former patient as a source. Only 18% of breast cancer articles (n = 6) and 13% of diabetes articles (n = 3) included both research and a current or former patient as source of information within the same article.

Within the 34 breast cancer articles and 23 diabetes articles, 250 and 129 total sources of information were identified, respectively. The breast cancer articles included 59 current or former patients as a source of information, accounting for 24% of all the breast cancer sources. Only eight current or former patients were used in diabetes articles, which was 6% of all the diabetes sources. Instead, 50% of the sources used in diabetes articles (n = 64) were research, compared to only 18% of the sources used in breast cancer articles (n = 45).

Eleven specific experts were sourced in breast cancer articles more than once. The individuals sourced the most were Elisa Port, MD, FACS (n = 6), Marc Hulbert, PhD (n = 5), Susan Brown MS, RN (n = 4), and Marissa Weiss, MD (n = 4). In contrast, only two specific experts were sourced more than once in diabetes articles; celebrity doctor Dr. Mehmet Oz was identified in five articles, and Ann Albright PhD, RD was identified twice.

The total number of distinctive sources of information were also noted for breast cancer and diabetes articles (i.e., repeat sources were counted only once); 210 of the 250 sources used in breast cancer articles and 122 of the 129 sources used in diabetes articles were distinctive sources. A complete breakdown of the distinctive sources appears in Appendix B.

### **Other Differences**

Some other characteristics investigated in the current study differed in the breast cancer and diabetes articles. Characteristics included the presentation of disease prevalence, discussion about treatment, referral of readers to further resources, and the

mention of the disease in the articles' subheadings. There was a tremendous difference between the percentage of breast cancer articles (6%, n= 2) and diabetes articles (74%, n= 17) that presented a measure of prevalence. Treatment was mentioned in 68% of the breast cancer articles (n = 23) compared to only 39% of diabetes articles (n = 9). Exactly half of the breast cancer articles (n = 17) and only 22% of the diabetes articles (n = 5) referred readers to resources for further information about the diseases. Lastly, of the breast cancer articles with at least one subheading (n = 22), 27% mentioned the disease there, and of the diabetes articles with at least one subheading (n = 17), 71% mentioned the disease there.

### **Similarities**

Some characteristics of coverage did not differ greatly between the two diseases. The most notable similarities regarded the proportion of articles that were published during the diseases' respective awareness months, the identification of signs or symptoms of disease, discussion about prognosis, presentation of a mortality or incidence measure, and identification of at least one risk factor.

Twenty-four, or 71%, of the breast cancer articles appeared in an issue published in October, which is Breast Cancer Awareness Month. Similarly, 15 of the diabetes articles, or 65%, appeared in an issue published in November, which is Diabetes Awareness Month. Thirty-five percent of breast cancer the articles (n = 12), and 48% of diabetes articles (n = 11) presented at least one sign and/or symptom of the disease. A slightly greater proportion of diabetes articles (35%, n = 11) than breast cancer articles (32%, n = 8) mentioned prognosis. Few breast cancer and diabetes articles mentioned the

incidence of disease (15% and 13%, respectively). None of the diabetes articles and 4 of the breast cancer articles (12%) identified a disease mortality. At least one risk factor was identified in slightly more diabetes articles (74%, n = 21) than breast cancer articles (62%, n= 17). A table of all the risk factors identified in the breast cancer and diabetes articles appears in Appendix C.

Other similarities included the type of content in the images contained in the articles, the number and types of sources of information used in the articles, the mention of the disease in the title, deck, and on the cover, and the placement of the article in the health section as opposed to somewhere else in the magazine.

For breast cancer and diabetes articles, the type of content depicted in the images was similar in various regards. Most images in breast cancer articles (67%, n = 64) and in diabetes articles (64%, n = 25) were of people. Moreover, women appeared in most of the images in the breast cancer articles (65%, n = 62) and in the diabetes articles (54%, n = 21). Men were in 8% of the breast cancer images (n = 8) and 15% of the diabetes images (n = 6), and children appeared in 7% of the breast cancer images (n = 7) and 10% of the diabetes images (n = 4). The images that did not contain people depicted either objects (e.g. food), a graph or a map, or something else (e.g. a cat). Twenty-seven percent of the breast cancer images (n = 26) and 36% of the diabetes images (n = 12) were of an object. None of the diabetes articles and two percent of breast cancer images (n = 2) were a graph or a map. Finally, 4% of the breast cancer images (n =4) had something other than a person, object, or map or graph.

The number of sources mentioned was similar between breast cancer and diabetes. Within the 34 breast cancer articles and 23 diabetes articles, 250 and 129 total sources of information were identified, respectively. The median number of sources per breast cancer related article was 4 (range = 1–28, Q1 = 2.25, Q3 = 10.75). The median number of sources per diabetes article was also 4 (range = 1–26, Q1 = 2, Q3 = 6.5).

Besides research and current or former patients, the percentages of types of sources used in breast cancer and diabetes articles were also similar. Table 5 contains a breakdown of the sources of information used in breast cancer and diabetes articles.

**Table 5** Types of Sources of Information Used in Breast Cancer and Diabetes Articles

	<i>Breast cancer sources (%)</i>	<i>Diabetes sources (%)</i>
<i>Current or former patient</i>	52 (21%)	8 (6%)
<i>Research</i>	45 (18%)	64 (50%)
<i>Specific expert</i>	96 (38%)	34 (26%)
<i>Organizations</i>	30 (12%)	7 (5%)
<i>Family/friend of current or former patient</i>	7 (3%)	2 (2%)
<i>Nonspecific experts</i>	5 (2%)	8 (6%)
<i>Specific expert <u>and</u> current or former patient</i>	7 (3%)	1 (1%)
<i>Specific expert <u>and</u> celebrity</i>	1 (0.5%)	5 (4%)
<i>Current or former patient <u>and</u> family/friend of current or former patient</i>	5 (2%)	0 (0%)
<i>Current or former patient <u>and</u> celebrity</i>	2 (1%)	0 (0%)
<i>Total</i>	250 (100%*)	129 (100%)

\*Due to rounding, percentages do not add to 100% exactly.



In both breast cancer and diabetes articles, most of the specific experts were affiliated with an organization or institution. The breakdown of the type of entity people were affiliated with, which is similar for both breast cancer and diabetes, appears in Table 6. All except four of the specific experts sourced in breast cancer articles were identified as affiliated with an organization or institution. The four experts not thus identified with affiliation were two authors of research studies, one breast surgeon of a patient featured in the article, and one other health professional. Organizations or institutions that individuals in breast cancer articles were most commonly identified as affiliated with were the Breast Cancer Research Foundation (n = 5), University of Texas MD Anderson Cancer Center (n = 5), Dana-Farber Cancer Institute (n = 5), and Robert H. Lurie Comprehensive Cancer Center (n = 4). All except two of the specific experts sourced in diabetes articles were affiliated with an organization or institution. The two experts not thus identified with an affiliation were both health professionals. Organizations that individuals in diabetes articles were affiliated with the most were Kaiser Permanente South San Francisco Medical Center (n = 3) and Joslin Diabetes Center (n = 2). Of the people identified in breast cancer articles with an affiliation to an organization or other entity, five also had a history of the disease themselves. Their affiliations were with a corporation (n = 1), a voluntary organization (n = 2), and an institution (n = 2); one individual who had a history of breast cancer and was affiliated with a voluntary organization was also a doctor.

**Table 6** Affiliations Cited for Specific Experts Sourced in Breast Cancer and Diabetes Articles

	<i>Breast Cancer (%)</i>	<i>Diabetes (%)</i>
<i>Institution</i>	45 (61%)	20 (64%)
<i>Voluntary organization</i>	9 (12%)	3 (10%)
<i>Government organization</i>	1 (1%)	2 (6%)
<i>Foundation or charity</i>	6 (8%)	-
<i>Corporation</i>	5 (7%)	3 (10%)
<i>More than one type</i>	8 (11%)	3 (10%)
<i>Total</i>	74 (100%)	31 (100%*)

The post-nominal titles specific experts were identified with appears in Table 7. The percentages of individuals holding each type of post-nominal title (e.g., MD) were similar between individuals sourced in breast cancer and diabetes articles (Table 7).

**Table 7** Percentage of Individuals Identified with Each Type of Post-nominal Title

	<i>Breast Cancer (%)</i>	<i>Diabetes (%)</i>
<i>MD</i>	40 (63%)	19 (58%)
<i>MD <u>and</u> other</i>	7 (11%)	4 (12%)
<i>PhD</i>	10 (16%)	4 (12%)
<i>Other (not MD nor PhD)</i>	3 (5%)	1 (3%)
<i>Multiple (other than MD and other)</i>	3 (5%)	5 (15%)
<i>Total</i>	63 (100%)	33 (100%)

Lastly, the types of organizations or other entities mentioned without an affiliation to a person (e.g. “According to the American Diabetes Association, ...”) were coded. In breast cancer articles, 14 distinctive entities were used as a source of information, and of the 14, four were sourced more than once (American Cancer Society, National Cancer Institute, U.S. Preventive Task Force, and American Congress of Obstetrics and Gynecologists). The breast cancer articles sourced eight voluntary organizations (e.g., American Cancer Society), three government entities (e.g., National Cancer Institute), and one each of an institution (Memorial Sloan Kettering Cancer Center), a foundation (Breast Cancer Research Foundation), and a corporation (KLAS Research).

In diabetes articles, five distinctive organizations or institutions were used as a source of information without an affiliation to a person, and of the five, only the Centers for Disease Control and Prevention was sourced more than once ( $n = 3$ ), and it was the only government entity to be sourced. Also sourced were two voluntary organizations (American Diabetes Association and Interact Consortium), and two institutions (Women’s College Research Institute and McGill University Health Centre).

Finally, the mention of the disease in the title, in the deck, and on the cover, and the inclusion of the article in the health section were all similar for breast cancer and diabetes articles. Half of the breast cancer articles ( $n = 17$ ) included either “breast cancer” or “cancer” in the title of the article, and slightly more diabetes articles (61%,  $n = 14$ ) mentioned “diabetes” in the title. Of the breast cancer articles that had a deck ( $n = 31$ ), 65% mentioned “breast cancer” there. Similarly, of the diabetes articles with a deck

(n = 14), 43% of the articles mentioned “diabetes” there. Few articles were mentioned on the cover of their respective magazine issue. *Family Circle* and *The O* each had one breast cancer article featured on their cover, and no magazines featured a diabetes article. Neither of the two breast cancer articles mentioned on the cover were the main feature story. Lastly, most of the breast cancer (94%, n = 32) and diabetes (91%, n = 21) articles were included in the health section as opposed to somewhere else in the magazine.

## CHAPTER IV

### DISCUSSION

This research compared coverage of breast cancer and coverage of diabetes in five popular US women's magazine from 2015 through 2019. Both the amounts of coverage and several characteristics of the coverage differed between the two diseases. Most notably, more articles, pages per article, and words per article were devoted to breast cancer. Both notable differences and similarities were observed regarding the content covered within the magazines. The differences regarded number and sizes of images contained in the articles, the coverage of risk factors, identification of screening as a risk-reducing behavior, mention of disease prevalence, the use of current or former patients and research as sources of information, and discussion about treatment. Notable similarities regarded discussion about signs and symptoms, identification of at least one risk factor, the percentage of articles that were published during the diseases' respective awareness month, discussion about prognosis, and identification of disease mortality and incidence. The current chapter reflects on the findings, with particular emphasis on possible reasons for them, and implications for women's disease awareness, risk perception, and social stigma.

#### **Awareness**

Despite efforts to increase awareness of diabetes with movements such as an official symbol and a month dedicated to awareness, diabetes has yet to achieve the same awareness and support as breast cancer. Moreover, more money is raised each year by Susan G. Komen, the leading breast cancer foundation, than by the leading diabetes

organization, the American Diabetes Association. The amounts of coverage devoted to each disease and the number, size, and content of images contained in the articles in the current study may stem from and contribute to the differential awareness of and concern about breast cancer and diabetes.

### **Amounts of Coverage**

To determine if more coverage was devoted to breast cancer than diabetes, the number of articles, total word count, and total page count were all recorded. More breast cancer articles ( $n = 34$ ) than diabetes articles ( $n = 23$ ) were published in the magazines in the current study. Additionally, more than three times as many words and pages were devoted to breast cancer as were devoted to diabetes. Because breast cancer is better known, the media may be more apt to report on it than diabetes, but the disproportionate reporting may also contribute to the fact that breast cancer remains more well-known. This notion is consistent with the agenda setting theory, which is the idea that the content the media chooses to report on helps determine what people think about (McCombs & Shaw, 1972). Additionally, breast cancer is looked at as a women's health problem because it affects almost only women, whereas diabetes affects both men and women more proportionately. Therefore, breast cancer lends itself well to appearance in women's magazines. However, women often oversee health decisions and behaviors for themselves and their families (McCarroll et al., 2016; U.S. Department of Labor, n.d.), so increased coverage of diabetes in places where women are exposed to health information, like women's magazines, could have substantial public health impact.

Although breast cancer coverage and diabetes coverage do not seem to have been compared with each other in a study before this one, the current findings are consistent with past studies of breast cancer and the media, which found the disease to be overreported (Champion et al., 2016; Marino & Gerlach, 1999). In contrast, a past study of diabetes and the media found the disease to be underreported (Wallace, 2003), relative to the diseases' public health importance. If the media were to report diseases proportionately to their impact on public health, diabetes would be in the spotlight more often than breast cancer. Awareness of diabetes might then eventually match or surpass that of breast cancer.

Additionally, most of the breast cancer articles (71%, n =24) appeared in an issue published during October, which is Breast Cancer Awareness Month. Similarly, 65% of the diabetes articles (n = 15) appeared in an issue published during November, which is Diabetes Awareness Month. However, only six of the breast cancer articles and none of the diabetes articles indicated that the article was being featured in the magazine as part of the diseases' awareness month. Readers are likely to be aware of and understand why breast cancer articles tend to be published during October; however, without the article explicitly saying that November is Diabetes Awareness Month, readers are unlikely to make that connection. Therefore, because magazines are already publishing a high percentage of their diabetes-related articles during November, it would be worthwhile for magazines to mention that the article is being published in part due to November being Diabetes Awareness Month, which may then help increase disease awareness.

## **Images**

The number, size, and content of images used in articles may also contribute to differential awareness of breast cancer and diabetes. A total of 96 images were used within the 34 breast cancer articles (median number of images per article = 3), and a total of 39 images were used within the 23 diabetes articles (median number of images per article = 1). Moreover, the images contained in breast cancer articles tended to be larger. Seventy-eight percent of images in breast cancer articles and all except for two of the images in diabetes articles (95%) were less than half a page in size. One of the remaining two images in the diabetes articles was between half a page and one page, and the other was one page exactly. Eleven of the images contained in breast cancer articles were between half a page and one page (12%), and 10 of the images were one page exactly (11%). Lastly, a recognizable symbol, the pink ribbon, appeared in almost half of the breast cancer articles (47%). A reoccurring symbol did not appear in the diabetes articles; however, food appeared in the images of almost half of the diabetes articles (48%).

Images make people pay attention more (Paivio, 2013), so the fact that breast cancer articles contained more images than diabetes articles and that the images were usually bigger may contribute to the greater awareness of breast cancer than diabetes. Many times, the number of images is proportional to the length of the story, and the fact that diabetes articles tended to be shorter may explain why they tended to have fewer images. Another possible explanation for the number and size of images is that breast cancer articles may be easier than diabetes articles to provide effective images for. In



other words, photos of women in pink, pink ribbons, and women with no hair may be easier to find and make more sense to repetitively use than images of glucose monitors, medications, and needles. To help increase the visibility of, and thus the awareness about, diabetes, the media should consider adding more pictures to diabetes articles, especially the articles that are longer. Making images larger or repetitively using images of symbols that represent the cause (e.g. a blue circle for diabetes) may also help increase diabetes awareness.

### **Risk Perception**

Risk perception affects which threats people find significant and what actions, if any, they take to mitigate those threats. Although diabetes affects three times as many women as breast cancer does (American Cancer Society, 2019a; Centers for Disease Control and Prevention, 2020), people often underestimate their risk of developing diabetes (Heidemann et al., 2019; Kowall et al., 2017). In contrast, although a similar number of women die of diabetes and breast cancer (Centers for Disease Control and Prevention & National Center for Health Statistics, 2020), women often overestimate the risk of death of breast cancer (Woloshin et al., 1999). The difference in risk perception may stem from and contribute to the coverage of these diseases in the media. The current study found that reporting of risk factors, screening, prevalence, and symptoms tended to differ between breast cancer and diabetes articles. These differences may contribute to skewed risk perceptions of the diseases.

## **Contribution of Risk Factors to Disease Development**

Breast cancer and diabetes have several risk factors in common, including physical activity, weight, age, family history, and genetics. However, some of these risk factors contribute to the development or mortality of diabetes and breast cancer to different extents. In the current study, some risk factors were covered proportionately to their contribution to disease development, but some others were not. Particularly, coverage of weight and physical activity seemed proportionate to their contribution to breast cancer and diabetes development, but coverage of family history, age, and genetics did not.

Nineteen percent of the breast cancer articles and 53% of the diabetes articles identified being overweight or obese as a risk factor. None of the breast cancer articles and 24% of the diabetes articles identified physical inactivity as a risk factor. Being overweight and physically inactive are major contributors for the risk of developing diabetes (American Heart Association, 2015) and are minor contributors to the likelihood of developing breast cancer (American Cancer Society, 2019a). Therefore, weight and physical activity were discussed more proportionately to their relative contribution to breast cancer and diabetes development.

Additionally, although age is one of the two main risk factors for breast cancer (the other being sex), a noticeably small percentage of articles that discussed risk factors identified age as a risk factor (14%). For diabetes, age is a risk factor that puts a woman at a moderately higher risk of developing the disease, and it was reported in six percent of the articles that discussed risk factors. One reason that age is identified in few breast

cancer and diabetes articles may be because the readers of the magazines are already in the age group at the greatest risk for these disease—over 50. However, the fact that the women at risk are reading the magazines does not mean that they know they are at risk. Explicitly identifying age as a risk factor would help women develop an accurate risk perception for the diseases. The current study is not the first to find that age as a risk factor has been left out of diabetes and breast cancer media (Reyes, 2005; Wallace, 2003; Walsh-Childers et al., 2011).

In the current study, 71% of breast cancer articles and 35% of diabetes articles reported family history as a risk factor. However, family history poses a similar risk for both diseases; someone with a first degree relative with breast cancer or diabetes has double the risk of developing the respective disease (American Cancer Society, 2019b; Cederberg et al., 2015). Past studies have also found that family history has been overemphasized as a risk factor for breast cancer (Marino & Gerlach, 1999; Reyes, 2005; Walsh-Childers et al., 2011). One possible reason that family history was identified in twice as many breast cancer articles as diabetes articles is that the role of family history in diabetes may be more complicated to explain in a magazine article. Diabetes has a strong link to family history, but family members tend to have similar diets, activity levels, and frequency of obesity (American Diabetes Association, n.d.). Therefore, it may difficult to differentiate genetic and environmental aspects of family history. Family history is a little more straight-forward for breast cancer because obesity, diet, and activity levels are only minor contributors to the disease (American Cancer Society, 2019a). However, because family history accounts for only 15% of breast

cancer cases (Easton, 2002), it may be misleading that in the current study, it is one of the two most identified risk factors in breast cancer articles.

In the current study, 71% of breast cancer articles presented genetics as a risk factor. In contrast, 12% of the diabetes articles mentioned genetics as a risk factor. The identification of genetics as a risk factor may be overrepresented in breast cancer articles relative to the factor's contribution to the disease development. For breast cancer, a genetic variation (i.e., mutation in BRCA 1, BRCA 2, or other genes) increases a woman's risk of developing breast cancer by the age of 80 from 10% to 70% (Kuchenbaecker et al., 2017), but only 5% to 10% of cases are linked to gene mutations (Apostolou & Fostira, 2013). Although lifestyle factors and the environment contribute, the American Diabetes Association says diabetes also has a strong link to genetics based on a study of twins (American Diabetes Association, n.d.; Kaprio et al., 1992). Genetics may have been identified as a risk factor in more breast cancer articles than diabetes articles because mutations in BRCA 1 and BRCA 2 are well-known contributors to the disease. Much less is known about the genetics of diabetes besides the fact that it is a moderate contributor based on the study of twins. The identification of genetics as a risk factor may be underrepresented in diabetes articles and overrepresented in breast cancer articles relative to the factor's contribution to disease development.

Reporting risk factors disproportionately, relative to their contribution to disease development, may be misleading and affect women's risk perception of diseases. The unbalanced reporting of family history, age, and genetics found in the current study suggest that women's magazines should do a better job depicting the risk factors based

on their contribution to the disease to ensure women have an accurate perception of their risk.

### **Screening**

Screening was mentioned in three-quarters of the breast cancer articles but only 15% of the diabetes articles. Moreover, for breast cancer, screening was identified more than any of the other risk-reducing behaviors. The identification of screening as a risk-reducing behavior in most breast cancer articles but few diabetes articles may contribute to the perceived risk of each of the diseases. Lack of reporting on diabetes screening may lessen the likelihood that a woman will participate in screening, thus lowering the chances of early detection, if she has the disease. In contrast, a higher rate of reporting on breast cancer screening may make women believe they are at a greater risk for the disease than they really are and pursue unnecessary screening.

Screening for breast cancer has increased early detection of disease, which has in turn reduced mortality (American Cancer Society, 2019a). One reason that screening may be discussed in most breast cancer articles is that the screening typically requires initiative; one often must seek screening outside of an annual wellness visit. Moreover, mammograms may cause psychological, physical, and financial distress. Therefore, magazines may be more likely to discuss mammograms because the experience makes for a more compelling story. However, mammograms have some limitations. Abnormal mammogram screenings may result in unnecessary additional diagnostic procedures (i.e., follow-up mammograms or biopsies) for a screening that turns out to be a false-positive (Lehman et al., 2017). Additionally, if a mammogram detects a small tumor, it

is most likely that the tumor would never have become large and led to clinical symptoms (Welch et al., 2016). Lastly, mammograms do not detect all breast cancers. Therefore, identifying screening as a risk-reducing behavior in most breast cancer articles may make breast cancer screening seem more urgent and lifesaving than it really is and may contribute to why women often overestimate their risk of dying of the disease.

As for diabetes, screening is also a recommended risk-reducing behavior. Even though screening does not reduce the mortality from type 2 diabetes (Pippitt et al., 2016), it leads to earlier detection and treatment, thus lessening the likelihood of developing complications of uncontrolled diabetes such as blindness and kidney failure (National Institute of Diabetes and Digestive and Kidney Diseases, n.d.). Moreover, screening is helpful for detecting prediabetes, a condition that can be reversed through lifestyle changes, thus lowering the likelihood of developing diabetes. One reason that screening may not have appeared in many diabetes articles is that diabetes screening is often a part of annual wellness visits—patients who see a primary care physician regularly do not have to actively seek screening for diabetes. Moreover, the screening is less dramatic than screenings for other diseases like breast cancer. However, excluding the importance of screening from diabetes articles may lead to the fact that many women underestimate their risk of developing diabetes.

### **Prevalence and Symptoms**

There was a tremendous difference between the percentage of diabetes articles (74%) and breast cancer articles (6%) that included prevalence. Additionally, only half

of the diabetes articles and a third of the breast cancer articles identified at least one sign or symptom of the diseases. The inclusion or exclusion of information on prevalence and signs and symptoms may contribute to readers' perceptions of risk for the two diseases.

Because a smaller percentage of breast cancer articles reported disease prevalence, women may not grasp that diabetes prevalence is more than three times that of breast cancer. The underwhelming proportion of breast cancer articles identifying disease prevalence may have to do with the fact that emphasizing prevalence in breast cancer articles would probably undermine the intended messages contained within them, because the number of women estimated to be living with a history of breast cancer (3.8 million) may be lower than what women think. It is important to identify disease prevalence in both breast cancer and diabetes articles so that women can compare accordingly. One-sided reporting of prevalence may be misleading and contribute to women's disproportionate risk perception of breast cancer and diabetes.

Additionally, for women to accurately recognize when they may have breast cancer or diabetes, they need to know the signs and symptoms of a disease. For example, it is important for women to become familiar with the feeling and appearance of their breasts because a newfound lump in the breast is a common sign of breast cancer (American Cancer Society, 2019a). One possible reason why few articles identified signs and symptoms of the diseases is that writers and editors may assume women already know the signs or symptoms of these diseases. However, that may not be the case, and information on signs and symptoms give women a clearer picture of these diseases to have an accurate risk perception.

The fact that some key characteristics about diseases such as prevalence and signs or symptoms were either not included in most of the articles or received one-sided reporting may contribute to some confusion about the risk of developing or dying of breast cancer and diabetes. To help improve women's risk perception of diseases, the media should aim to consistently report prevalence and signs and symptoms of disease. Women can then compare how many people the diseases affect and develop a clearer picture of these diseases' signs to have a better perception of their own risk of developing the disease.

### **Social Stigma**

Both breast cancer and diabetes are associated with feelings of stigma. Women who are diagnosed with breast cancer often feel societal pressures to remain positive and suppress feelings of fear (Powers et al., 2016). Additionally, in a survey of over 2,000 adults about their perceptions of chronic diseases, including heart disease, diabetes, breast cancer, and other cancers, women respondents (n = 1,675) were most concerned about and perceived themselves at the greatest risk for breast cancer. Additionally, after ovarian cancer, women felt the least control over breast cancer. In contrast, respondents indicated that after heart disease, they felt the most control over diabetes and perceived it as the least serious condition (Wang et al., 2009). These perceptions may contribute to why current diabetes patients often report feelings of exclusion (Liu et al., 2017) and an unwillingness to disclose their condition to others (Browne et al., 2013). In the current study, breast cancer articles tended to include current or former patients as sources of information whereas diabetes articles tended to include research instead. More breast



cancer articles talked about treatment than did diabetes articles, which may also make a woman feel in or out of control. Lastly, few breast cancer and diabetes articles presented both at least one risk factor out of a woman's control (i.e., unmodifiable) and at least one risk factor that a woman may have more control over (i.e., modifiable) within the same article. The depiction of breast cancer as unpreventable and diabetes as avoidable may stem from and contribute to the coverage of these diseases in the media and the perceived social stigma.

### **Unmodifiable vs. Modifiable Risk Factors**

Of the articles that presented at least one risk factor, all the breast cancer articles (n = 21) but only about half of the diabetes articles (53%, n = 9) identified at least one risk factor out of a woman's control (i.e., unmodifiable). Oppositely, significantly more diabetes articles (83%, n = 14) than breast cancer articles (33%, n = 7) identified at least one risk factor that a woman may have more control over (i.e., modifiable). Moreover, only seven breast cancer (33%) and seven diabetes articles (41%) identified at least one unmodifiable and one modifiable risk factor within the same article. The fact that breast cancer articles tended to identify mostly unmodifiable risk factors may make women feel a lack of control over the disease, which may instill a greater sense of fear and contribute to why women consistently report breast cancer as one of their greatest health fears (Wang et al., 2009). Although breast cancer has major unmodifiable risk factors, factors within a woman's control also contribute. Oppositely, diabetes tends to be greatly attributed to modifiable risk factors, but factors outside an individual's control also play a role. Therefore, leaving out the unmodifiable risk factors from diabetes articles and

tending to identify mostly modifiable risk factors may make women feel that they can and should be able to control the development of the disease completely, which may create a greater social stigma around diabetes. To ensure that women have the most accurate picture of the risk factors for a disease, reporting both modifiable and unmodifiable risk factors of each disease may be beneficial to reducing stigma of both diseases. Without doing so, the media may contribute to the unbalanced picture that diabetes is entirely preventable and breast cancer is inevitable.

### **Narrative vs. Informational**

Only 18% of breast cancer articles and 13% of diabetes articles in the current study included both research and a current or former patient as a source of information within the same article. Fifty-nine percent of the breast cancer articles included a current or former patient as a source of information and 53% included research. Eighty-three percent of the diabetes articles included research as a source of information and only 17% included a current or former patient. In past studies of breast cancer in the media, narrative-based stories have dominated informational-based reporting (Atkin et al., 2008; Champion et al., 2016; Reyes, 2005). The lack of narrative-based reporting in diabetes media has also been observed in women's magazines (Wallace, 2003). The tendency for the breast cancer articles to include a current or former patient and the diabetes articles to use research as sources of information may contribute to the stigma of the diseases in the following ways.

Societal pressures to be positive during and after treatment (Powers et al., 2016) may be exacerbated by the positive portrayal of breast cancer seen in the magazine

articles. For example, one article analyzed in the current study titled “What I Learned from Breast Cancer” (published in *Better Homes and Gardens*) told the diagnosis stories of five survivors (Auginaush, 2019). The stories of the women—most with a positive spin—may be misleading and contribute to why women feel societal pressure to be positive. One survivor mentioned how fortunate she was to have radioactive material inserted during one of her surgeries, so she didn’t have to go to the hospital every day for weeks for treatment. Another survivor discussed how remaining on her regular work schedule helped her get through treatment. Similarly, another survivor talked about graduating from college and starting a new job during treatment and how positive the experience was with human resources. Finally, only two survivors’ stories seemed to have less positivity; one woman discussed the most challenging part about her diagnosis was deciding where she was going to get treatment, and another woman discussed losing her job and running out of money she had saved before finding a foundation that helped pay for all her surgeries. Together, the abundance of current and former patients as sources of information in breast cancer articles and the lack of mentions of research may contribute to the stigma felt by breast cancer patients.

The lack of current or former patients as a source of information in diabetes articles may exacerbate the exclusion or rejection felt by many diabetes patients (Liu et al., 2017). People engage more with and recall more from stories that are narrative based as opposed to informational (McQueen et al., 2011). Therefore, women are more likely to connect with an article that discusses someone that is going through the hardships of the disease rather than discussing only research studies. The stories from current or

former diabetes patients may seem less compelling to tell than breast cancer patients' dramatic treatment or diagnosis experiences and may be a reason why few diabetes articles include current or former patients as sources of information. However, a story about a woman who must deal with lifelong complications from undiagnosed diabetes or a woman who has turned her life around with diet and exercise may be just as compelling to tell. Moreover, stories such as these may be influential for normalizing and thus reducing diabetes stigma.

### **Treatment**

The proportions of articles that discuss treatment may also contribute to why women fear breast cancer more than diabetes and why there is a stigma about diabetes. In the current study, treatment was mentioned in more breast cancer articles (68%) than diabetes articles (39%). One way the coverage of treatment may contribute to women's fear of breast cancer is that the treatment for breast cancer is often dramatic (e.g., surgery, chemotherapy, etc.). Moreover, the dramatic nature itself may explain the disproportionate reporting seen in the current study—breast cancer treatment may be a more compelling story to tell. However, in some ways, treatment for diabetes may be just as substantial; many times, treatment for diabetes can alter daily routines and quality of life for the remainder of one's life. Examples include frequent blood glucose monitoring, daily medications, or a modified diet.

By discussing and thus normalizing treatment in most of the breast cancer articles, breast cancer patients may feel stigmatized by societal expectations to be a survivor who has beaten cancer after treatment (Powers et al., 2016). However, some

women choose to not receive treatment, especially women whose cancer is diagnosed as metastatic (Miller et al., 2019). Moreover, women who do receive treatment and go into remission are often fearful of recurrence (Powers et al., 2016). Therefore, societal expectations—which likely stem from and contribute to the coverage of breast cancer in the magazine articles—to be positive, fight the disease, and embrace wellness can be misleading and ultimately stigmatizing. Similarly, diabetes patients already feel an unwillingness to discuss their condition with others (Browne et al., 2013), and women may feel their treatment journey, including lifelong lifestyle changes, are shameful to discuss because the magazine articles do not include them. Excluding discussion about treatments in diabetes-related magazine articles may stem from and contribute to the diabetes stigma. If diabetes articles were to discuss treatment and thus normalize it, like breast cancer articles, those without diabetes may be more understanding of the condition, and women with diabetes may feel more willing to disclose their experiences to others.

### **Other Results**

Some characteristics of coverage did not differ much between breast cancer and diabetes articles and have not yet been discussed in this chapter. Some notable similarities regarded the inclusion of at least one risk factor, discussion about prognosis, and identification of disease mortality and incidence.

At least one risk factor was identified in slightly more diabetes articles (74%) than breast cancer articles (62%). The fact that most articles included at least one risk factor for the disease may be indicative that writers aim to include at least one risk factor

in all health-related articles as part of good health reporting. Additionally, only slightly more diabetes articles (35%) than breast cancer articles (32%) mentioned prognosis. Few breast cancer articles (15%) and diabetes articles (13%) mentioned the incidence of disease. Lastly, none of the diabetes articles and 4 of the breast cancer articles (12%) identified a disease mortality. Again, the exclusion of these elements from the articles may indicate what is normally seen in health-related articles. However, their exclusion may still contribute to the skewed risk perceptions often reported by women.

Lastly, the type of content depicted in the images was similar across all categories. Most images contained in breast cancer articles (67%) and in diabetes articles (64%) were of people. The inclusion of people may simply be more attractive and easier to find than pictures of medical devices and other objects. Overall, including images of people in an article discussing a disease that affects humans is fitting.

Some other similarities included the number of sources of information, the inclusion of the name of the disease in the title and deck of the article, and the articles' appearance in the health section. The median number of sources of information per article was four for both breast cancer and diabetes. The number of sources used may be indicative of the fact that good reporting often entails using multiple sources. A similar percentage of breast cancer and diabetes articles included the disease in the title and deck of the article, and most articles appeared in the health section of the magazines. These final similarities may be indicative of good health reporting in magazines because people know they will find health-related articles in the health section, and they can

decide if they are interested in the topic of the article by glancing at the title and deck for the disease's name.

## CHAPTER V

### CONCLUSION

Breast cancer and diabetes are both public health concerns, but many women are more afraid of breast cancer (Wang et al., 2009) even though diabetes affects more American women and takes a similar number of American women's lives (American Cancer Society, 2019a; Centers for Disease Control and Prevention, 2020; Centers for Disease Control and Prevention & National Center for Health Statistics, 2020). Moreover, women underestimate their risk of developing diabetes (Heidemann et al., 2019; Kowall et al., 2017). The purpose of this study was not to diminish the importance of breast cancer reporting; instead, the purpose was to compare the reporting of both breast cancer and diabetes in hopes that, if differences were found, the media could help increase diabetes awareness and contribute to more accurate risk perceptions and reduction of stigma of both diseases.

From 2015 through 2019 in the five popular US women's magazines included in this study, more articles, words, and pages were devoted to breast cancer; 34 breast cancer articles and 23 diabetes articles were identified. Three times as many words were devoted to breast cancer as was to diabetes. A total of 42,557 words were devoted to breast cancer (median word count per article = 976, range = 98–4,227), and 13,459 words were devoted to diabetes (median word count per article = 460, range = 105–2,157). Because breast cancer is better known, the media may be more apt to report on it than diabetes, but the disproportionate reporting may also contribute to the fact that breast cancer remains more well-known. Additionally, breast cancer is considered a



women's health problem because it disproportionately affects females, whereas diabetes affects both men and women more proportionately. Therefore, breast cancer lends itself well to appearance in women's magazines. However, because women often oversee health decisions and behaviors for families (McCarroll et al., 2016; U.S. Department of Labor, n.d.), greater coverage of diabetes in women's magazines could have substantial public health impact. Overall, women's magazines may be able to help increase women's awareness of diabetes by devoting more coverage to diabetes than at present.

Most of the diabetes articles (74%) and almost none of the breast cancer articles (6%) identified disease prevalence. Additionally, almost five times as many breast cancer articles (74%) as diabetes articles (15%) identified screening as a risk-reducing behavior. The underwhelming amount of breast cancer articles identifying disease prevalence may have to do with the fact that emphasizing prevalence would probably undermine the intended messages contained within the breast cancer articles because the number of women estimated to be living with a history of breast cancer (3.8 million) may be lower than what women think. However, it is important to identify disease prevalence in both breast cancer and diabetes so that women can proceed accordingly. One-sided reporting of prevalence may be misleading and contribute to women's disproportionate risk perception. Similarly, the identification of screening as a risk-reducing behavior in most breast cancer articles but few diabetes articles may contribute to the perceived risk of each of the diseases. Lack of reporting on diabetes screening may lessen the likelihood that a woman will participate in screening, thus lowering the chances of early detection. In contrast, a higher rate of reporting on breast cancer

screening may make women believe they are at a greater risk for the disease than they really are. Identifying prevalence in more breast cancer articles and identifying screening as a risk-reducing behavior in more diabetes articles may help women develop accurate risk perceptions of the two diseases.

Less than half of the breast cancer articles (33%) and diabetes articles (41%) that identified at least one risk factor identified both unmodifiable and modifiable factors within the same article. Instead, all the breast cancer articles identified at least one unmodifiable risk factor and only 33% identified at least one modifiable. Oppositely, more diabetes articles reported at least one modifiable risk factor (82%) than at least one unmodifiable risk factor (53%). Leaving out the unmodifiable risk factors in diabetes articles may make women feel that they can and should be able to control the development of the disease completely, which may create a greater social stigma around the disease. The fact that few breast cancer and diabetes articles presented both unmodifiable and modifiable risk factors may present the unbalanced picture that diabetes is entirely preventable and breast cancer is inevitable. Reporting both unmodifiable and modifiable risk factors in breast cancer and diabetes articles may help reduce stigma women feel about both diseases.

Additionally, the tendency for breast cancer articles to use current or former patients as a source of information and for diabetes articles to refer to research may contribute to overall disease awareness disparities. A little more than half of all the breast cancer articles (59%,  $n = 20$ ) and only 17% of the diabetes articles ( $n = 4$ ) included a current or former patient as a source of information. About half of all the

breast cancer articles (53%) and most of the diabetes articles (83%) cited research as a source of information. Less than a quarter of all breast cancer and diabetes articles used both a current or former patient and research within the same article. Breast cancer articles may be more narrative-focused because current and former breast cancer patients' stories about screening and treatment may be more dramatic and compelling to tell. However, in ways, stories about women's experiences with diabetes may be just as compelling because the disease often is accompanied by lifelong lifestyle changes. Regardless, using current or former patients as sources of information in more diabetes articles may help reduce stigma women feel about the disease.

Lastly, treatment was mentioned in more breast cancer articles (68%) than diabetes articles (39%). Excluding discussion about treatments in diabetes-related magazine articles may stem from and contribute to the diabetes stigma. If diabetes articles were to discuss treatment and thus normalize it, like breast cancer articles, those without diabetes may be more understanding of the condition, and women with diabetes may feel more willing to disclose their experiences to others.

Because magazines are a major way in which women not actively seeking health information are exposed to it, women's magazines could be of greater service by presenting a more balanced picture of breast cancer and diabetes. Moreover, women who do actively search for health information in women's magazines should consider looking elsewhere in addition to the magazines such as the websites of the organizations concerned with the respective diseases. Unbalanced information pertaining to diseases may distort the way women view their risk of developing the diseases. Women's

magazines are not the only place women find health information; however, increasing diabetes reporting in women's magazines and emulating more features of breast cancer coverage may help convey the seriousness of diabetes to women. Diabetes will likely take decades to reach the awareness and support that breast cancer has. However, women's magazines—and more generally, the media—can play an important role in accelerating the process. With the help of the media, women may participate more in diabetes screening, become more aware of personal factors that put them at risk for diabetes, and maintain a healthier lifestyle more than ever before.

### **Limitations**

This study has some limitations. Only high-circulating US women's magazines were analyzed, so generalizability is limited. Furthermore, only the magazines' print versions were analyzed, and the online versions may have differed. Additionally, the observational nature of this study revealed only associations, and the results cannot indicate causality. Lastly, although a sample of articles were manually retrieved to test the reliability of the MasterFILE indexing database, using the database may be a limitation because there is not a guarantee that the indexing is complete or accurate for the entirety of the study. Similarly, because MasterFILE did not index *Family Circle* for 2015 and 2016, I selected articles manually from the issues published in this timeframe, which may have created an inconsistency in data collection because of human error.

### **Recommendations for Further Study**

After completing the current study, I have a few recommendations for further study. Interviewing writers and editors of the magazines to gain insight into how they

decide what content to include in the articles could provide beneficial information for why differences existed between breast cancer and diabetes coverage. Another recommendation for further study is a comparison between breast cancer and diabetes coverage in the online versions of these magazines or other media entirely. Magazines' online versions, which are becoming increasingly prominent, may yield different results and offer additional insight into how the two diseases are covered. Additionally, because magazines are not the only place women are exposed to health information, further studies comparing breast cancer and diabetes coverage in other media including podcasts, social media, broadcast media, or online newspapers should also be considered.

Another recommendation for future studies is comparing additional characteristics of images contained in the articles. For example, one could determine if the ages and ethnicities of the people portrayed in the images are representative of the populations at most risk for these diseases. Additionally, whereas this study is mainly quantitative, it would be worthwhile to investigate qualitative content to produce additional comparisons for the coverage of breast cancer and diabetes. For example, comparing the framing and themes seen in breast cancer and diabetes magazine articles or other media may be beneficial to gain additional insight into how these diseases are portrayed in the media.

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APPENDIX A

CODEBOOK

<u>Question</u>	<u>[Code]</u>	<u>Definition(s)</u>
What is the title of the article?	[“Title”]	Title of the magazine article
What is the publication information of the magazine the article appears in?	[month year/ vol, issue]	Month, year, volume, issue of magazine article
What page range does the article appear on?	[# <sub>1</sub> - # <sub>2</sub> ]	# <sub>1</sub> = page article begins on # <sub>2</sub> = page article ends on
What is the page count of the article?	[#]	# = length of story as MasterFILE defines it
What is the word count of the article?	[#]	# = word count of the article as MasterFILE defines it
Is the disease mentioned in the title of the article?	[Yes, No]	Yes = “breast cancer” or “diabetes” appears in the title
Is the disease mentioned in the deck, if any?	[Yes, No, N/A]	Yes = “breast cancer” or “diabetes” appears in the lines of text appearing between the title and the body paragraphs N/A = there is not a deck for the article

<b><u>Question</u></b>	<b><u>[Code]</u></b>	<b><u>Definition(s)</u></b>
Is the disease mentioned in the subheading(s) within the article, if any?	[Yes, No, N/A]	Yes = “breast cancer” or “diabetes” appears in at least one of the subheading(s) N/A= there are not any subheadings for the article
Is the article featured on the cover of the issue?	[Yes, No]	Yes = the article is mentioned on the cover
If the article is mentioned on the cover of the issue, is it the main feature story?	[Yes, No]	Yes = the article is the story relating to the cover’s photo or listed in the largest font
Is the article featured in the health section of the magazine?	[Yes, No]	Yes = the article appears in the health section of the magazine
Does the article include risk factors?	[Yes, No]	Yes = The article includes at least one variable associated with an increased risk of developing a disease
If the article includes risk factors, which one(s)?	[Check all that apply]	<u>Breast Cancer</u> : Family history, age, race/ethnicity, genetics, personal history, dense breasts, sex, past radiation exposure, overweight/obese, physical inactivity, alcohol, hormone replacement therapy, and other: ____ <u>Diabetes</u> : family history, age, race/ethnicity, genetics, history of gestational, overweight/obese, physical inactivity, diet, lack of sleep, other: ____
Does the article include a risk-reducing behavior?	[Yes, No]	Yes = The article includes at least one measure that can be taken by an individual to lessen the likelihood of disease development / death from disease



<b><u>Question</u></b>	<b><u>[Code]</u></b>	<b><u>Definition(s)</u></b>
If the article identifies risk-reducing behaviors, which one(s)?	[Check all that apply]	<u>Breast cancer</u> : maintain healthy weight, physical activity, avoid/limit alcohol, avoid hormone replacement therapy, genetic counseling, medicines, preventive surgery, screening, avoid smoking, diet, other: ____ <u>Diabetes</u> : maintain healthy weight, physical activity, control blood glucose levels, screening, diet, other: _____
Does the article mention signs and symptoms of the disease?	[Yes, No]	Yes = The article mentions abnormalities that can indicate the presence of a disease No = The article does not mention abnormalities that can indicate the presence of a disease
If the article mentions signs and symptoms, which one(s)?	[check all that apply, N/A]	<u>Breast cancer</u> : lump, swelling, redness, lymph node swelling, other: _____ <u>Diabetes</u> : high blood sugar, increased thirst/hunger, frequent urination, blurry vision, fatigue, tingling in hands/feet, other: ____ N/A if none are identified
Does the article mention treatment?	[Yes, No]	Yes = The article mentions management or treatment for a patient to fight a disease
Does the article mention prognosis?	[Yes, No]	Yes = The article mentions the survival rate, expectations for quality of life, or improvement/worsening of symptoms overtime.
Does the article identify incidence?	[Yes, No]	Yes = The article provides number or rate of new cases in a specific time period

<b><u>Question</u></b>	<b><u>[Code]</u></b>	<b><u>Definition(s)</u></b>
Does the article identify prevalence?	[Yes, No]	Yes = The article provides the number of Americans living with the disease or a rate of people with a disease
Does the article identify mortality?	[Yes, No]	Yes = The article provides the number of or rate of people who die from the disease in a specific time period
Does the article discuss research?	[Yes, No]	Yes = The article includes information from a study or ongoing research about a disease
Does the article include a story from a current or former patient of the disease?	[Yes, No]	Yes = The article quotes or discusses a person living with or who has a history of the disease
How many sources of information are identified in the article?	[#]	# = number of sources, pertaining to the disease, identified in the article
What sources of information, pertaining to the disease, are identified in the article?	[list name, identify type, post-nominal titles (if any), and affiliations to any organizations (if any)]	Name = Name of the person or organization Type = Specific expert, current or former patient, family or friend of current or former patient, research., organization, nonspecific expert (e.g., “researchers say...”, celebrity, other: ____

<u>Question</u>	<u>[Code]</u>	<u>Definition(s)</u>
Does the article refer readers to further resources?	[Yes, No]	Yes = The article refers reader to further resources to obtain information about the disease No = The article does not refer the reader to further resources to obtain information about the disease
How many images, if any, are contained in the article?	[#]	# = number of images in the article
What content is depicted in the image(s) contained in the article?	[P(#), G(#), O(#), Other: ____]	# = number of times the code appears in the article P = Person/People G = Graph, Chart, or Infographic O = Object Other: = Other not listed in code
If the article contains image(s) with a person/people, who are the subjects in the images?	[W(#), M(#), H(#), C(#), K(#), H: (name the combo/ #)]	# = number of articles with code W = Woman(en) M = Man(en) H = Health Professional(s) C = Celebrity(ies) K = Child(ren) H = The image contains multiple people in a combination of categories above
What space of the page does the image(s) cover?	[L(#), H(#), P(#)]	#= number of articles with code L= Less than ½ page H= ½ page to 1 page P= 1 page

APPENDIX B

TYPES OF DISTINCTIVE SOURCES OF INFORMATION USED IN  
BREAST CANCER AND DIABETES ARTICLES

	<b>N (Breast Cancer)</b>	<b>Percentage (Breast Cancer; out of 210)</b>	<b>N (Diabetes)</b>	<b>Percentage (Diabetes; out of 122)</b>
<b>Research</b>	45	21%	64	52%
<b>Organizations (with no affiliation to a person)</b>	14	7%	5	4%
<b>Current or former patient</b>	52	25%	8	7%
<b>Family / friend of current or former patient</b>	7	3%	2	2%
<b>Doctor / health professional</b>	4	2%	2	2%
<b>Specific expert affiliated w/ an institution</b>	43	20%	20	16%
<b>Specific expert affiliated w/ a corporation</b>	4	2%	3	2%
<b>Specific expert affiliated w/ a voluntary organization</b>	7	3%	3	2%
<b>Specific expert affiliated w/ a government organization</b>	1	1%	2	2%
<b>Specific expert affiliated w/ a foundation</b>	6	3%	0	0%
<b>Specific expert affiliated w/ multiple types of organizations</b>	8	4%	3	2%
<b>Celebrity doctor</b>	1	1%	1	1%
<b>Celebrity and current or former patient</b>	2	1%	0	0%
<b>Health professional with history of disease</b>	1	1%	1	1%
<b>Individual affiliated w/ an organization <i>and</i> current or former patient</b>	5	2%	0	0%
<b>Individual w/ history of disease <i>and</i> family/friend of current or former patient</b>	5	2%	0	0%
<b>Unspecified individuals</b>	5	2%	8	7%

APPENDIX C

PERCENTAGE OF ARTICLES IDENTIFYING RISK FACTORS OF BREAST  
CANCER AND DIABETES

	<b>Breast Cancer Risk Factor</b>	<b># of articles (%)</b>		<b>Diabetes Risk Factor</b>	<b># of articles (%)</b>
<b>M O D I F I A B L E</b>	Overweight or obese	4 (19%)	<b>M O D I F I A B L E</b>	Overweight or obese	9 (53%)
	Physical inactivity	0		Physical inactivity	4 (24%)
	Alcohol	4 (19%)		Diet*	7 (41%)
	Not having children	1 (5%)		Lack of sleep*	4 (24%)
	Hormone replacement therapy / Birth control / High estrogen levels	6 (29%)		Other	8 (47%)
	Smoking / Smoke exposure*	3 (15%)			
	Other	4 (19%)			
<b>U N M O D I F I A B L E</b>	Family history	15 (71%)	<b>U N M O D I F I A B L E</b>	Family History	6 (35%)
	Genetics	15 (71%)		Age	1 (6%)
	Race/ethnicity	4 (19%)		Race/ethnicity	1 (6%)
	Age	3 (14%)		Genetics	2 (12%)
	Dense breast tissue	7 (33%)		Elevated blood pressure	2 (12%)
	Family history of other cancers*	5 (24%)		Personal history of gestational diabetes	1 (6%)
	Gender	2 (10%)			
	Past radiation exposure	2 (10%)			
	Personal history	1 (5%)			

\*Risk factors not identified by the American Cancer Society or American Diabetes Association but were identified in magazine articles as risk factors