National Print and Electronic News Coverage of Self-Management Behaviors and Efficacy for Type 2 Diabetes Mellitus

A thesis submitted to the College of Communication and Information of Kent State University in partial fulfillment of the requirements for the degree of Master of Arts

by

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Chapter I

Introduction

Diabetes mellitus is an epidemic running rampant in America (Boyle, Thompson, Gregg, Barker, & Williamson, 2010; Centers for Disease Control and Prevention (CDC), 2009; Mainous, Barker, Koopman, Saxena, Diaz, Everett, & Majeed, 2007). This widespread chronic disease is killing patients and driving up health care costs (Hogan, Dall, Nikolav, & American Diabetes Association (ADA), 2002). No cure exists for diabetes (ADA, 2010). Recently, national attention on health reform led to U.S. policy and media agendas emphasizing the importance of addressing population health and the rising costs of health care, making diabetes a prime target for national public health initiatives. Concern about the future burden of diabetes is reflected in Healthy People 2020 (U.S. Department of Health and Human Services, 2010b), the nation’s public health objectives for the current decade.

Type 2 diabetes, which accounts for 95% of diabetes cases in the U.S. (CDC, 2011), can be delayed and/or prevented through a combination of self-management behaviors and lifestyle interventions (Barlow, Sheasby, Turner, & Hainsworth, 2002; CDC, 2007; Norris, Engelgau, & Naryan, 2001). For patients living with and being treated for diabetes, successful self-management behaviors are hindered by the complexity of the disease (Barlow et al., 2002; Grant, Pirraglia, Meigs, & Singer, 2004), lifestyle changes brought on by disease development and treatment (Gucciardi, Demelo, Offenhiem, & Stewart, 2008; Tuomilheto et al., 2001), barriers to treatment adherence (Aikens, Bingham, & Piette, 2005; Hiesler, Bourknight, Hayward, Smith, & Kerr, 2002).

1 All subsequent discussion of diabetes and statistics included are in reference to and consistent with type 2 diabetes mellitus.
and a variety of possible health complications (ADA, 2010; U.S. Department of Health and Human Services, 2010). News media are a major source of health information for providers, patients, and the general public (Brodie, Hamel, & Altman, 2003; Gollust & Lantz, 2009; Kline, 2006; Manganello & Blake, 2010; Meissner, Potosky, & Convisser, 1992; Phillips, Kanter, Bednarczyk, & Tastad, 1991), and affect public opinion (Brännstrom & Lindbald, 1994; Gollust, Lantz, & Ubel, 2009; McCombs, 2002), public policy (Brodie et al., 2003; Yanovitzky, 2002), and individuals’ health-related decisions (Slater, Hayes, & Ford, 2007; Stryker, 2003; Yanovitzky & Bennet, 1999; Yanovitzky & Blitz, 2000). Additionally, news media can play an important role in health behavior change by informing the public (Berry, Wharf-Higgins, & Naylor 2007; Brodie et al., 2003; Goodall, Sabo, Cline, & Egbert, in press; Lewison, 2008; Pierce & Gilpin, 2001), modeling behaviors to avoid health threats (Mebane, Temin, & Parvanta, 2003), and encouraging disease prevention and management (Moriarty & Stryker, 2008; Rock, 2005; Schwartz & Woloshin, 2002; Yanovitsky & Blitz, 2000).

With increased national attention on the burden of chronic diseases (Boyle et al., 2010), importance of preventive care (Hogan, Dall, Nikolav, & ADA, 2003), and necessity for health reform (Roberts, Hsiao, Berman, & Reich, 2003), diabetes is appearing in the forefront of the U.S. public health agenda (U.S. Department of Health and Human Services, 2010b). Thus, this study addressed the question: “How do news media portray the self-management behaviors for type 2 diabetes mellitus?” The research involved a quantitative content analysis of U.S. news media coverage of type 2 diabetes from 2009 to 2011 and strived to understand how news media portray diabetes self-management behaviors and efficacy of disease management. First, this study discusses
the societal impact of diabetes and the need for research to understand news coverage of diseases.

Rationale

Type 2 diabetes has reached epidemic proportions in the U.S. (Boyle et al., 2010; CDC, 2009, 2011; Mainous et al., 2007), making the disease one of the leading threats to the public health of the nation (see U.S. Department of Health and Human Services, 2010c). The magnitude of type 2 diabetes has captured attention of policy makers, mass media, and the American public. News media are a primary source of health information for the general public (Brodie et al., 2003; Schwartz & Woloshin, 2002). The present study advances potential applications of fear processing theoretical frameworks by striving to better understand health-related news messages that potentially influence health behavior. Thus, identifying communication processes and trends in diabetes news coverage may contribute to understanding the potential influence of health messages on the public’s disease knowledge and ability to take preventive action against type 2 diabetes.

Magnitude of the Type 2 Diabetes Problem. The epidemic magnitude of type 2 diabetes in the U.S. population can be demonstrated through the combination of the epidemiologic prevalence of the disease and the economic burden of the disease (see ADA, 2008; Berry et al., 2007; Boyle et al., 2010; Campbell, 2001; CDC, 2009; Hogan et al., 2002; Mainous et al., 2007). Both the number of people affected by type 2 diabetes and the financial costs attributed to the disease are increasing exponentially and are predicted to continue rising (ADA, 2008; Boyle et al., 2010; CDC, 2009, 2011). The CDC recently released a report projecting diabetes incidence rates, mortality, and
prediabetes prevalence for the U.S. adult population through the year 2050 and citing a significant increase in the effects of the disease (Boyle et al., 2010).

**Prevalence of type 2 diabetes.** Currently, the CDC estimates that 25.8 million people in the U.S. are affected by diabetes (8.3% of the U.S. population), of which nearly 7 million are unaware of their disease (CDC, 2011). Another 79 million Americans have been estimated to be pre-diabetic (CDC, 2011). This brings the total number of Americans affected by diabetes to over 100 million (ADA, 2010; CDC, 2007, 2011). By 2050, an estimated one-in-three American adults will be living with diabetes – nearly triple the current rates (Boyle et al., 2010). Both environmental and genetic factors contribute to the growing prevalence of the disease (Samocha-Bonet, Campbell, Viardot, Freund, Tam, Greenfield, & Heilbronn, 2010).

Diabetes is a *creeping* disease and *chronic* in nature. Symptoms appear slowly and progress over long periods of time (CDC, 2009). Diabetes is known as a “silent killer” (Campbell, 2001) because often no obvious symptoms occur, which contributes to late diagnosis or allows the disease to remain undiagnosed. A perception also exists among the public that diabetes is a “mild disease” (i.e., that it is not immediately life-threatening; Campbell, 2001) when, in fact, it is the seventh leading cause of death in the U.S. (U.S. Department of Health and Human Services, 2010a). The disease is characterized by insulin resistance (insulin is a hormone regulating sugar production in the pancreas) and brought on by obesity, excessive alcohol consumption, and/or lack of or insufficient exercise (ADA, 2010; U.S. Department of Health and Human Services, 2010c). Type 2 diabetes is especially prevalent in minority populations and individuals with a family history of the disease (CDC, 2011).
Diabetes generally appears in adults over the age of 40 and progresses in conjunction with complications such as obesity, heart disease, hypertension, stroke, blindness, and limb amputations (ADA, 2010; CDC, 2011; U.S. Department of Health and Human Services, 2010c). The possibility for diabetes to coincide with and/or cause other diseases, known as co-morbidity, is what makes diabetes especially lethal (Campbell, 2001). Diabetes can directly coincide with the first and third leading causes of death in the U.S. (U.S. Department of Health and Human Services, 2010a), heart disease and stroke (CDC, 2007, 2011). The relationship with other diseases can result in lifestyle and management complications for patients, treatment complications for providers, and increased health care costs (ADA, 2010; Grant et al., 2004; Nagelkerk, Reick, & Meengs, 2006). Although type 2 diabetes is known as “adult onset” diabetes, increasing reports of cases appearing in adolescents has led to the funding of the SEARCH for Diabetes Youth Study (CDC, 2011) to better understand the prevalence of the disease among American youth. Obesity is cited as one of the major causes for the increase in both adult and adolescent diabetes (ADA, 2010). A significant challenge of living with the disease is that individuals must enact multiple preventive care health behaviors to successfully manage their blood insulin levels on a daily basis. The prevalence and complexity of treating the disease is threatening both the public and financial health of the nation.

Costs of type 2 diabetes. In 2007, the total calculated financial cost for diagnosed cases of diabetes was $174 billion (CDC, 2007). Adding in the costs of undiagnosed diabetes, pre-diabetes, and gestational diabetes brings the cost of diabetes in the U.S. to $218 billion (CDC, 2007). Increasing rates of adolescent obesity and an aging population are making diabetes a ticking “time bomb” for the U.S. public health and economy.
An economic cost analysis by the ADA (2008) found that one in ten dollars spent on health care in the U.S. is attributed to diabetes. Individuals diagnosed with diabetes have, on average, medical expenses that are 2.3 times higher than those without the disease. The burden of diabetes extends beyond direct medical costs of those diagnosed and permeates all sectors of society by affecting insurers, employers, families, and U.S. taxpayers (ADA, 2008; Boyle et al., 2010).

The CDC (2007, 2011) cites a combination of weight loss, increased physical activity, and lifestyle interventions as more cost-effective than medication in treating and preventing complications of type 2 diabetes (CDC, 2007, 2011). Weight loss, increased physical activity, and lifestyle change all fall under self-management behaviors for type 2 diabetes (Barlow et al., 2002). The combination of lifestyle intervention and self-management is the most medically efficacious and cost effective strategy for preventing and treating type 2 diabetes (ADA, 2010; CDC, 2011; Norris et al., 2001).

**The importance of self-management.** Self efficacy is an especially important concept for understanding whether individuals enact chronic disease self-management behaviors (see Barlow et al., 2002; Lorig, Stewart, Ritter, Gonzalez, Laurent, & Lynch, 1996; Marks & Allegrante, 2005). In a review of self-management literature, Barlow et al. (2002) define self-management as “an individual’s ability to manage the symptoms, treatment, physical and psychosocial consequences and life style changes inherent in living with a chronic condition” (p. 178). The goal of efficacious self-management is for individuals to be capable and competent in improving his or her quality of live through self-regulation of disease (Barlow et al., 2002; Funnel, Brown, Childs, Hass, Hosey, Jensen … & Wiess, 2009; Lorig et al., 1996; Marks & Allegrante, 2005; Norris,
Glasgow, Engelgau, O’Connor, & McCulloch, 2003). Self-management has even been referred to as “inevitable” in chronic conditions (Bodenhiemer, Lorig, Holman, & Grumbach, 2002, p. 2469) in that patients make behavioral decisions on *how* they choose to live with their disease (e.g., complying with recommended health behaviors or not, regardless of positive or negative outcomes).

Diabetes self-management plans (see Lorig et al., 1996) target primary and secondary prevention. Primary prevention in type 2 diabetes is prevention or delay of the onset of the disease (Bowman, Gregg, Williams, Engelau, & Jack, 2003; CDC, 2011; Dornhorst & Merrin, 1994; Tuomilhetho et al., 2001) through lifestyle modification, while secondary prevention in type 2 diabetes is the prevention of diabetic complications (e.g., heart disease, blindness, kidney disease) through disease management (Bowman et al., 2003; CDC, 2011; Dornhorst & Merrin, 1994; Tuomilhetho et al., 2001).

With increasing rates of chronic disease (Boyle et al., 2010; CDC, 2011) and rising costs of chronic disease care (ADA, 2008; Boyle et al., 2010; CDC, 2007; Hogan et al., 2002), self-management interventions are attractive because of their potential to positively affect health outcomes and reduce health care costs (Bodenhiemer et al., 2002; Lorig & Holman, 2003; Lorig et al., 1996). With an increasing number of diabetes cases related financial cost on the rise, the epidemic has gained increased attention (Armstrong, Carpenter, & Hojnacki, 2006) among policy makers (Gollust & Lantz, 2009; Yanovitzky, 2002), and in popular culture (Kline, 2006) and the news media (Gollust & Lantz, 2009).

**Type 2 diabetes in the public eye.** Communication of diabetes-related health information though public policy, public health campaigns, and popular media has placed type 2 diabetes in the eye of the American public (U.S. Department of Health and Human
Services, 2000, 2010b; Funnel et al., 2009; Gollust & Lantz, 2009). Agenda setting literature suggests that this diabetes-related media coverage may set the public agenda to attend to diabetes as a topic of interest and affect public opinions on type 2 diabetes (see Cohen, 1963; McCombs & Shaw, 1972). In turn, the media have the potential to influence health behavior change, including disease self-management, through news coverage.

**Diabetes in public policy.** The fight against diabetes is gaining national attention from public health organizations, the White House, and opinion leaders. Dedicated to improving the health of all Americans, the 10-year national health agenda, *Healthy People 2020* (U.S. Department of Health and Human Services, 2010b), includes several objectives focused on prevention and combating the diabetes epidemic.

*Healthy People 2020* includes diabetes policy objectives continued from *Healthy People 2010* (U.S. Department of Health and Human Services, 2000), as well as new objectives including improving diabetes self-management and increasing prevention behaviors (U.S. Department of Health and Human Services, 2010b). *Healthy People 2020* diabetes-specific objectives regarding self-management include: “(D-5), improve glycemic control among the population with diagnosed diabetes” (p. D-3), “(D-7) increase the proportion of the population with diagnosed diabetes whose blood pressure is under control” (p. D-3), “(D-13) increase the proportion of persons with diagnosed diabetes who perform self-glucose monitoring at least once daily” (p. D-6), and “(D-16) increase prevention behaviors in persons at high risk for diabetes with pre-diabetes” (p. D-7). The prevention aspects of these national diabetes objectives are beginning to appear in public communication campaigns and popular media.
Diabetes in communication campaigns and popular media. With prevention in mind and directly related to early diabetes diagnosis, Michelle Obama developed her “Let’s Move” campaign to fight childhood obesity (U.S. Department of Health and Human Services, 2009). The campaign aims to change parents’ and children’s beliefs about their health by helping families, schools, and communities encourage better food choices and daily physical activity. Disseminating public service announcements, press releases, and media advisories, the National Diabetes Education Program (NDEP) strives to communicate that type 2 diabetes is serious, common, costly, controllable, and preventable (U.S. Department of Health and Human Services, 2010c).

On February 4, 2010, The Oprah Winfrey television show dedicated a special program to increasing awareness of diabetes and prevention practices for the disease. Oprah said, [diabetes is] “annihilating the African American community. Literally. It’s killing almost 100 of us every single day in the African American Community” (Winfrey, 2010). The popular prime-time reality weight loss television show The Biggest Loser, highlights chronic disease awareness and prevention by portraying contestants attempting to manage their struggle with obesity, and type 2 diabetes brought on by obesity, through healthy lifestyle changes.

At present, few media analyses of health messages have investigated diabetes-specific messages in response to diabetes appearing as a topic in the public eye (e.g., see Kline, 2006; Mangello & Blake, 2010; Rock, 2005; Gollust & Lantz, 2009). Diabetes is appearing in public policy reform, public communication campaigns, popular media, and news coverage (Gollust & Lantz, 2009; Rock, 2005), increasingly exposing the American public and those at-risk for diabetes to potentially health-related messages.
**Potential impact of news coverage on health behavior.** The communication process of agenda setting suggests that media tell the audience what topics to think about (Cohen, 1963; McCombs & Shaw, 1972) and how to think about those topics (Iyengar & Kinder, 1987). This influence on the audience in turn sets the topics in the public agenda (see McCombs, 2002). Public health issues and concerns are a frequent topic of interest in the mass media and for the general public (Ho, Brossard, & Scheufele, 2007). Interest in public health issues is reflected by agenda setting effects, front page coverage (Lai, Lane, & Jones, 2009), and media outlets’ use of specialized health correspondents, health sections, and event-based increases in health news coverage (i.e., H1N1) (Goodall et al., in press; Ho et al., 2007; Shih, Wijaya, & Brossard, 2008). News coverage constitutes an important information source because of the potential influence of news messages on attention to health-related variables (Pierce & Gilpin, 2001; Slater, Goodall, & Hayes, 2009; Slater et al., 2007). The lay public tends to get much of its health information from the news media (Atkin, Smith, McFeters, & Ferguson, 2008) by following coverage on public health, health policy, and diseases (Brodie et al., 2003).

Research has demonstrated the power of the news media to influence health beliefs and behaviors. Health-related news messages can increase knowledge and encourage interpersonal communication between physicians and patients, which has been shown to play a significant role in the treatment and management of diabetes and achievement of desired outcomes (Aikens et al., 2005). News coverage can encourage prevention and screening of other chronic diseases such as cancer via mammography-seeking behavior in women who do not have regular communication with their doctor (Stryker, Moriarty, & Jensen, 2008; Yanovitsky & Blitz, 2000). News media have been
shown to influence health beliefs and behaviors related to alcohol use (Slater et al., 2009; Slater et al., 2007), marijuana use (Stryker, 2003), and smoking (Pierce & Gilpin, 2001). Pierce and Gilpin (2001) found longitudinal evidence for increased news coverage on smoking and health to positively correlate with smoking cessation rates. Although not strategically planned as a health intervention, news coverage has the potential to encourage adaptive behavior change by providing the information and action steps required to protect one’s health (Caburnay et al., 2003; Davidson & Wallack, 2004; Goodall et al., in press; Neuwirth, Dunwoody, & Griffin, 2000).

Limitations of news coverage for health behavior change. Unfortunately, news coverage does not always achieve its health-related potential. News coverage does not always provide adequate information to inform the public on disease prevention and often omits the most important behavioral recommendations and informational components necessary for adaptive behavior change (Atkin et al., 2008; Berry, Wharf-Higgins, & Naylor, 2007; Goodall et al., in press; Moriarty & Stryker, 2008). Media coverage of health topics does not necessarily coincide with disease mortality rates, prevalence, and incidence (Adelman & Verbrugge, 2000). For example, AIDS has received greater news coverage (Armstrong et al., 2006; Hoffman-Goetz, Shannon, & Clark, 2003) than other chronic diseases (like diabetes) that ultimately cause more deaths in the U.S. (CDC, 2011). Although events of disease outbreak (e.g., pandemic flu) receive disproportionate media attention in relation to diseases that are consistently present among the public (e.g., heart disease), a subsequent decrease in media coverage does not imply a resolution to the health problem (Shih et al., 2008). For example, decreases in diabetes coverage may
be event-based (e.g., lack of new scientific discoveries) rather than solution-based (e.g., there is no known cure for diabetes).

News media tend to emphasize acute diseases and illnesses that involve mortality and/or emerging threats (Adelman & Verbrugge, 2000; Armstrong et al., 2006; Goodall et al., in press; Freimuth, 2006) rather than slowly-developing chronic diseases (Armstrong et al., 2006). This disparity in coverage is further reflected in the low number of published empirical research analyzing media messages on chronic disease. Content analyses of U.S. health messages from 1985 to 2005 have focused primarily on topics related to substance abuse, violence, sex, body image, and obesity (Manganello & Blake, 2010). Only one of these topics, obesity, is a chronic condition like diabetes. Chronic diseases may be difficult to represent because of the complexity of required treatment and management (Barlow et al., 2002; Grant et al., 2004). A chronic disease may not always be cited as the specific cause of mortality (Adelman & Verbrugge, 2000) – for example, a news story may omit that complications from diabetes was the root cause of kidney failure that led to death.

Print and broadcast media also tend to underrepresent diseases that disproportionately affect minority populations compared to whites (Armstrong et al., 2006), such as diabetes, to which Black and Hispanic populations are especially susceptible (Brown et al., 2004; CDC, 2007). In an analysis of media depictions of type 2 diabetes disparities, Gollust and Lantz (2009) found newspaper coverage to scarcely identify any social group disparities of the disease (i.e., differential rates among specific races/ethnicities). The lack of coverage on racial disparities in chronic disease may suggest that it is not yet a topic on the public agenda (see Gollust & Lantz, 2009;
Armstrong et al., 2006) and may contribute to a lack of knowledge about chronic disease within particular racial/ethnic groups.

When news stories on chronic disease do not focus on providing mobilizing information for audiences to take or maintain action (Hoffman-Goetz et al., 2003), self-management behaviors may be underrepresented. By omitting key self-management information, news media coverage may misrepresent or underrepresent one of the most medically and cost effective strategies for preventing and treating diabetes (ADA, 2008; Barlow et al., 2002; CDC, 2011). Further, identifying trends in diabetes news coverage may contribute to understanding the potential influence of health messages on the public’s disease knowledge and practice of self-management behaviors.

Focus of the Study

The purpose of this research was to conduct a “systematic and replicable” (Riffe, Lacy, & Fico, 1998, p. 20) analysis of self-management and efficacy messages in news coverage of type 2 diabetes. The study implemented a quantitative content analysis (Krippendorff, 2004; Manganello & Blake, 2010; Neuendorf, 2002; Riffe & Fietag, 1997) of news media coverage of type 2 diabetes mellitus from 2009 to 2011. The study time frame of 2009 to 2011 was selected to represent growing attention the epidemic has received from the public agenda (Armstrong et al., 2006; Lewin, 2007), popular culture (Kline, 2006), and the news media (Gollust & Lantz, 2009; Kline, 2006). The time frame coincides with the conclusion of the Healthy People 2010 diabetes objectives (U.S. Department of Health and Human Services, 2000) and the transition into Healthy People 2020 objectives (U.S. Department of Health and Human Services, 2010b).
The majority of literature analyzing health messages and behavior has concentrated on planned health messages (Witte & Allen, 2000), while few studies have used fear processing frameworks to analyze news coverage (for exceptions, see Goodall et al., in press; Manganello & Blake, 2010). Applying fear processing frameworks to news messages may add to theory development and contribute insights to health-related media advocacy efforts. Drawing on Leventhal’s (1970) “parallel response model” and Rogers’s (1975) protection motivation theory, the extended parallel processing model (EPPM) (Witte, 1992) was used as a framework to guide the present analysis. Findings from this study were analyzed from the perspective of the EPPM and contribute to understanding how print and electronic news coverage provides health information (Brodie et al., 2003; Pierce & Gilpin, 2001), portrays health behaviors (Stryker, 2003; Stryker et al., 2008; Yanovitsky & Blitz, 2000), and encourages or fails to encourage disease prevention and management (Moriarty & Stryker, 2008; Rock, 2005; Schwartz & Woloshin, 2002; Yanovitsky & Blitz, 2000) of type 2 diabetes mellitus. Chapter II critically discusses recent research and identifies research questions that guided the investigation.
Chapter II

Review of Literature

Fear processing models have evolved to demonstrate the multiple-step cognitive processes behind adaptive and maladaptive behavioral responses to health messages (Floyd, Prentice-Dunn, & Rogers, 2000; Witte, 1992; Witte & Allen, 2000) and identify useful components for exploring how incidental health messages, including news coverage, may influence health behavior. The agenda setting and news values literature may contribute to understanding how print and electronic news coverage provide health information, portray health behaviors, and present disease prevention and management information. Chronic diseases, like type 2 diabetes, may be difficult to represent accurately in news media because of their many unique epidemiologic complications and recommended behaviors for disease management. Applying Witte’s (1992) extended parallel processing model to news messages on type 2 diabetes may contribute insights into health-related messages that potentially influence health behavior.

Theoretical Framework

In a systematic review of published studies on content analyses of health messages in U.S. media from 1985 to 2005, Manganello and Blake (2010) found fear appeal processing models to be rarely used as a guiding framework for analysis. The majority of research built on fear processing models investigated formally-planned persuasive messages (Floyd et al., 2000; Witte & Allen, 2000; Sutton, 1982). Only recently have these models been used in innovative approaches to understand the potential influence of fear in unintended messages (e.g., messages not intentionally designed to persuade) in responses to disasters (Roberto, Goodall, & Witte, 2008), hazards (Neuwirth, et al., 2000) and emerging health threats (Goodall et al., in press).
Notably absent from the literature are applications of fear processing models to media representations of chronic diseases (see Kline, 2006; Manganello & Blake, 2010). The constructs of these models are potentially useful for explaining how fear arousing messages found in incidental health messages can influence behavior.

**Fear appeal processing models.** Initial fear processing literature and models emphasized that behavior change is brought on by the arousal of emotions, specifically *fear* (Janis, 1967; Sutton, 1986). According to early models discussed by Janis (1967), the amount of motivation necessary for people to take action (recommended behavior change) is dependent on the amount of fear experienced. Clarifying the mechanism for how the fear message process works to influence behavior, Leventhal (1970) proposed the “parallel response model.” According to that model, adaptive behavior change is elicited through: (a) danger control and (b) fear control. *Danger control* occurs when an individual perceives danger (or threat) and reacts by making changes to his or her attitudes, intentions, or behaviors in order to avert the danger. *Fear control* occurs when an individual denies or avoids a threat in response to fear (Leventhal, 1970). Rogers (1975) further explicated the fear message process by shifting from an emphasis on fear to an emphasis on *threat*. Rogers’s protection motivation theory suggests that fear is processed via two appraisals comprised of four components: a *threat appraisal* consisting of (a) seriousness of a threat and (b) susceptibility to a threat, and a *coping appraisal* consisting of (c) an ability to enact a recommended change, and (d) the extent to which the recommended change avoids a threat. Thus, fear processing models have evolved to demonstrate the multiple-step cognitive processes behind adaptive and maladaptive behavioral responses to health messages (Floyd et al., 2000; Witte, 1992; Witte & Allen
**The extended parallel process model.** Based on constructs from Leventhal’s, (1970) “parallel response model” and Rogers’s (1975) protection motivation theory, the extended parallel processing model (EPPM) (Witte, 1992) frequently is used as a framework for understanding the processing of fear appeal messages. The EPPM outlines an individual’s cognitive appraisal and response to a threat-based message. It is comprised of three cognitive processes: fear, threat, and efficacy. Fear is a negative emotion brought on by the perceived threat an individual experiences from a message. Threat is something likely to cause harm to an individual; this includes both the chance of being affected by the threat (susceptibility) and amount of threat (severity) (Witte, 1992; Witte & Allen, 2000). Efficacy is an individual’s ability to produce a desired result (see Bandura, 1997a; 1997b). Response-efficacy and self-efficacy are included in this model. Response-efficacy is the belief that a threat can be deterred or reduced by following a recommended action. Self-efficacy is an individual’s belief about his or her ability to carry out the recommended action (Bandura, 1998). The interaction between fear, threat, and efficacy leads to one of three responses (Witte, 1992; Witte & Allen, 2000).

The EPPM suggests that an individual responds to a threat-based message by seeking to reduce his or her fear of the threat. An individual can have one of three possible responses to a threat-based message: no response, message acceptance, or message rejection. When individuals do not perceive a threat to be harmful, they have no response to a threat-based message. Message acceptance, which can also be viewed as message effectiveness, is measured by an individual’s intention to adopt the
recommended action(s) of the message (Witte, 1992). According to EPPM, if an individual perceives the threat as relevant, he or she will experience fear and seek recommendations (efficacy) for avoiding the threat. Once equipped with efficacy information, an individual can avoid threat by changing his or her behaviors in accordance with the message. When an individual perceives a threat, but cannot obtain sufficient efficacy information to avoid the threat, the message is rejected. Upon message rejection, an individual may discount the message, fail to make a suggested change, or make maladaptive changes to his or her behavior in response to threat (i.e., change in an opposite or negative direction; Witte, 1992; Witte & Allen, 2000).

Empirical findings testing the EPPM are somewhat inconsistent. The framework has received mixed support regarding the specific process behind the interaction (high versus low) between threat and efficacy and how this influences message outcomes (Roskos-Ewoldsen, Yu, & Rhodes, 2004; Roberto & Goodall, 2009; Witte & Allen, 2000). Witte (1992) suggests that threat interacts with high perceived efficacy where the effectiveness of high threat messages is dependent on an adequately high level of efficacy. Witte and Allen (2000) suggest that threat and efficacy act independent, finding that in addition to the original high threat and high efficacy (HTHE) proposition of EPPM (Witte, 1992), high threat and low efficacy (HTLE) messages and low threat and high efficacy (LTHE) messages also are effective for influencing behavior. The majority of research supports that the most effective messages for encouraging adaptive behavior change are high in both threat and efficacy (Floyd et al., 2000; Leventhal, 1970; Maibach & Murphy, 1995; Moriarty & Stryker, 2008; Roberto & Goodall, 2009; Rogers, 1975; Roskos-Ewoldsen et al., 2004; Witte & Allen, 2000). Of particular interest in this study
are the EPPM components of threat of type 2 diabetes (susceptibility and severity of the disease) and efficacy (response efficacy and self-efficacy for enacting disease specific self-management behaviors) that are included in news messages along with health-related behaviors. According to the EPPM, a message high in threat of type 2 diabetes and high in efficacy of self-management behaviors may be the most effective in encouraging adaptive behavior change for diabetes prevention and management. The severity, susceptibility, response efficacy, and self-efficacy components of the EPPM provide a useful framework for exploring how incidental health messages, like news coverage, may influence behavior.

**The Nature of News Coverage**

Understanding which topics the news media portray (e.g., what topics are covered and which are omitted and/or ignored in media coverage) requires understanding how news media function both as an industry and as a communication process. The news media as an industry (particularly print news based organizations), are constantly challenged to maintain an audience (e.g., see Harcup & O’Neill, 2001). In order to survive, news media must adapt to how the public consumes information (e.g., see Harcup & O’Neill, 2001). News media must keep up with the demands of the public audience for timely, relevant and exciting (attention-getting) news topics that are presented in multiple formats through the media (e.g., access to breaking news stories through social media sites and mobile phone applications; Harcup & O’Neill, 2001; McCombs, 2002). Two communication-related processes may influence what variables make a topic *newsworthy* to the public and the news media and why certain topics receive more media attention than others: news values and agenda setting.
News values refers to the process through which journalists, editors, and news organizations select topics and stories, which then become news consumed by the public (see Harcup & O’Neill, 2001). Galtung and Ruge’s (1965) seminal argument that a topic’s “newsworthiness” is largely event based (e.g., how well an event satisfies multiple factors for topic selection) remains relevant even in today’s dynamic multimedia news environment (Harcup & O’Neill, 2001). Gollust and Lantz (2009) describe the selection of topics in news coverage as “the product of a competitive process among multiple actors vying for finite amounts of attention and space in which to define a problem, assign blame, and suggest who is responsible for addressing it” (p. 1092). In addition to satisfying multiple competing variables for topic selection, journalists and news organizations are under internal and external pressure to inform and entertain (Galtung & Ruge, 1965; Harcup & O’Neill, 2001). Once a topic is determined as newsworthy, it has the potential to influence the public agenda.

Agenda setting literature, traditionally demonstrated with political topics in the media, suggests that the media tell the audience what topics to think about (Cohen, 1963; McCombs & Shaw, 1972) and how to think about those topics (Iyengar & Kinder, 1987). This influence on the audience in turn sets the public agenda and affects public opinion (see McCombs, 2002). McCombs (2002) suggests that the likelihood of agenda setting effects occurring with a specific topic is influenced by two factors: (a) the extent to which the issue is obtrusive versus unobtrusive and (b) the need for orientation. If a topic is obtrusive (obviously a part of the public’s knowledge), the public will not rely heavily on media for information because society has access to information through prior general knowledge and personal experience (e.g., the common cold). If a topic is unobtrusive,
agenda setting effects are greater and the public is more reliant upon the media for information (e.g., a previously unknown infectious disease, like H1N1). The need for orientation addresses individual *relevance* of and *uncertainty* about a topic (McCombs, 2002). The greater an individual’s need for orientation, the more likely he or she is to attend to related news coverage (see Shoemaker, 1996). Nearly 66% of U.S adults report paying attention to health news appearing in newspapers (see Stryker et al., 2008) and are potentially exposed to and affected by unintentional health messages through processes of agenda setting and news values.

**Disease Threat Messages**

The negative emotion of *fear* is aroused by the perception of a significant and personally relevant *threat* (Witte, 1992). Brodie et al. (2003) suggest that the American public does not attend to disease-related news that is not personally relevant or is not perceived as threatening. For example, an obese young adult who believes that diabetes occurs only in elderly individuals may not perceive diabetes as immediately threatening to his or her health. According to EPPM, when a message elicits a high *threat* appraisal, an individual perceives that something is likely to cause harm and responds by seeking to protect him- or herself from danger (e.g., starting a diet and exercise plan; Witte, 1992; Witte & Allen, 2000). If perceived threat is low, no response occurs (e.g., the individual continues an unhealthy diet and inactive lifestyle). In order for an individual to perceive a message as threatening, the message must evoke both perceived severity of, and perceived susceptibility to, the threat. Individuals are more likely to make adaptive behavior changes when a health-related message includes an accurate and relevant portrayal of threat (Brodie et al., 2003; Witte, 1992; Witte & Allen 2000).
Unfortunately, media coverage of health threats is not always consistent with disease severity or epidemiologic susceptibility. Mixed support exists regarding what variables make a disease newsworthy and why certain diseases receive more media attention than others (e.g., HIV/AIDS vs. non-infectious diseases; see, Armstrong et al., 2006). Depending on the disease, media coverage may reflect or deviate from trends of mortality, prevalence, and incidence (Adelman & Verbrugge, 2000; Armstrong et al., 2006; Singer & Endreny, 1993); follow public policy interests (Gollust & Lantz, 2009; Yanovitzky, 2002); or increase due to a specific event (Berry et al., 2007; Goodall et al., in press Ho et al., 2007). Much of the media attention to health threats concentrates on high-profile diseases like AIDS (Armstrong et al., 2006; Hoffman-Goetz et al., 2003) and breast cancer (Atkin et al., 2008), both of which cause fewer deaths than other chronic diseases in the U.S. (CDC, 2011). Research indicates that news coverage about heart disease and diabetes contains disproportionately fewer references to death than coverage of diseases with lower mortality rates (e.g., mortality of HIV/AIDS is sensationalized despite lower rates of prevalence and incidence when compared to heart disease, which is the number one killer in the U.S.; Adelman & Verbrugge, 2000; CDC, 2011). Thus, an individual may perceive that these high-mortality diseases have relatively lower risk or are not as threatening to his or her health (e.g., see Walter, Emery, Braithwaite, & Marteau, 2004).

Generalizing how media universally represent health threats is difficult because of the unique characteristics of each individual threat. Rather than a uniform representation across the type of disease (e.g., STDs), media coverage of disease risks and threats tends to be specific to the disease in that any given disease has unique medical and social
implications (e.g., HIV/AIDS versus HPV) (see Davidson & Wallack, 2004; Kline, 2006). For example, STDs may receive less or incomplete media coverage because of a potential social stigma of talking openly about sex and diseases. In an analysis of STD coverage in print news media, Davidson and Wallack (2004) found severity to be low as evidenced by underreported risks and prevention; only 19% of articles in their sample referenced susceptibility in terms of the causes, consequences, or rates of STDs and only one third of articles mentioned an STD other than HIV/AIDS. In some cases, representations of threat may be complicated by coverage of opposing views – like anti-immunization (vaccine) messages for largely preventable diseases (see, for example, Goodyear-Smith, Petousis-Harris, Vanlaar, Turner, & Ram, 2007).

Emerging infectious diseases have received consistently high amounts of news attention as threats to public health (Ho et al., 2007). Pandemic outbreaks of avian flu, severe acute respiratory syndrome (SARS), anthrax, West Nile virus, and H1N1 have dominated health news coverage at various times and contributed to public fear of these threats (Berry et al., 2007; Goodall et al., in press; Lewison, 2008; Mebane et al., 2003; Wilkins, 2005). In response to emerging diseases, the public generally has the highest perceived threat (along with highest news coverage) early during the outbreak; threat declines over time as disease infection rates slow (Ho et al., 2007). Initial attention to these threats may be especially high (Ho et al., 2007) because of the tendency of news media to discuss health topics in terms of mortality rather than disease prevention (Adelman & Verbrugge, 2000; Berry et al., 2007). Consistent with these findings, Goodall et al. (in press) found H1N1 news coverage to overreport death and hospitalization (risk and severity) relative to the low incidence as reported by the CDC.
and to underreport actions to address the threat (prevention). Although similar to emerging threats, in that chronic diseases are epidemic in nature (CDC, 2011), they are portrayed and perceived differently.

Adelman and Verbrugge (2000) suggest that coverage of chronic disease reaches a “maturity” stage in which sustained media attention occurs once “a disease becomes a taken-for-granted health problem, has efficacious control regimens, or no longer inspires public hysteria” (p. 359). Coverage of chronic diseases can best be described as “imbalanced” (Kline, 2006, p. 47; Stryker et al., 2008). That is, attention to chronic diseases does not reflect the amount of threat the diseases pose to public health (Adelman & Verbrugge, 2000; Kline, 2006). For example, diabetes news messages have been more prevalent than cancer messages (Gollust & Lantz, 2009; Hoffman-Goetz et al., 2003; Kline, 2006), even though cancer is the second highest cause of death in the U.S. (CDC, 2011). The tendency for media coverage of chronic diseases to accent individual behaviors as risks for disease over societal or environmental factors (Brown, Zavestoski, McCormick, Mandelbaum, & Luebke, 2001; Gollust & Lantz, 2009) remains one of the few constant findings. One reason for inconsistencies in news coverage may be that chronic diseases can be especially difficult to represent because of the abundance of variables that contribute to disease susceptibility and severity and the complexity of prevention and treatment responses (CDC, 2011; Bonow & Gheorghiade, 2004; Grant et al., 2004).

Representations and perceptions of threat associated with chronic diseases tend to focus on individual factors over societal factors (see Gollust & Lantz, 2009; Kline, 2006; Mercado-Martinez, Robles-Silva, Moreno-Leal, & Franco-Almazan, 2001; Saguy &
Almeling, 2008). Cancer-related news coverage has been found to emphasize threat (and fear elicited by threat) by citing individuals’ fear of a cancer diagnosis, their uncertainty of disease development and outcomes, increasing disease rates, and “scary” mortality statistics (Clark & Everest, 2006, p. 2,596). Atkin et al. (2008) found that news media report breast cancer twice as often through personal narratives versus statistical figures and neglect to present risk information related to lifestyle practices. Representations of physical and mental disabilities (e.g., epilepsy or schizophrenia) have predominately negative connotations that perpetuate stereotypes associated with these diseases and stigmatize by accenting how affected individuals are different than those without disability (see Kline, 2006). Saguy and Almeling (2008) suggest that news coverage of obesity sensationalizes the disease as a societal epidemic while at the same time placing blame on the individual for his or her weight. The complexity of chronic conditions may further contribute to inconsistencies in media representations of these diseases.

Obesity and diabetes both present unique reporting challenges for news media (and studies attempting to understand these messages) because of their ability to cause, coincide with, and affect the outcomes of each other and other chronic diseases. This may complicate the news media’s ability to accurately portray disease threat. Although the literature has yet to investigate how news media portray diabetes threat messages, a common misperception exists among the public that diabetes is a “mild” disease and not as life-threatening as other diseases (Campbell, 2001).

Previous studies on diabetes-specific news messages have taken a societal health approach to understanding how the disease is framed (Gollust & Lantz, 2009, p. 1,092; Rock, 2005), concentrating on social and economic determinants and disparities, rather
than on individual susceptibility, severity, and efficacy. As noted by Rock (2005), print media tend to frame type 2 diabetes as a problem that is: (a) insidious in nature, (b) associated with particular groups (e.g. comparison of prevalence from one group to another, U.S. versus Canada), and/or (c) medical in nature. Each type of portrayal, placing blame on societal factors or on individual factors, may affect public perception of the disease in a different way. In a comprehensive analysis of type 2 diabetes in news media, Gollust and Lantz (2009) found that just over half (58%) of diabetes articles made causal claims about the disease. Although Gollust and Lanz’s study concentrated on societal determinants, the study found the most commonly cited individual causes were obesity or weight gain and lifestyle behaviors. Thus, media discussions about the causes of diabetes tend to be dominated by individual behavioral factors (e.g., lack of exercise or poor diet) instead of societal determinants (e.g., lack of access to healthy food; Gollust & Lantz, 2009)

Studies by Rock (2005) and Gollust and Lantz (2009) provide an excellent overview as content analyses of how news media frame type 2 diabetes as a disease, but cannot adequately speak to the mechanism by which news message content may influence adaptive behavior change. However the EPPM and other fear processing models (see Leventhal, 1970; Rogers, 1975) may do so. With regard to threat messages in national print and electronic news coverage of type 2 diabetes mellitus, the following research questions were advanced:

RQ1: What percentage of stories reference severity of type 2 diabetes mellitus?

RQ2: What percentage of stories reference susceptibility to type 2 diabetes mellitus?
Fear processing literature suggests that high threat messages that include *efficacy* are more effective than messages that lack efficacious information and thus have a greater influence on adaptive behavior change (Rogers, 1975; Witte, 1992; Witte & Allen, 2000).

**Efficacy Messages and Health Behavior**

According to the EPPM, when a message elicits an adequately high level of perceived threat, individuals seek strategies to reduce or avert the threat (Witte, 1992; Witte & Allen, 2000). Individuals are likely to make behavioral modifications in response to threat if the message includes efficacy information. Fear processing literature proposes two possible ways that threat and efficacy influence message outcomes. Witte (1992) suggests an *interaction* between threat and efficacy where the effectiveness of high threat messages is dependent on an adequately high level of efficacy. In contrast, Witte and Allen (2000) found support for an additive model in which threat and efficacy *independently* rather than interactively in affecting message outcomes.

Extending the EPPM literature, Rimal (2006) found both cross-sectional and longitudinal support for an interaction between perceived risk (and threat), self-efficacy, and health behaviors. Specifically, the combination of high perceived risk and high perceived efficacy was positively correlated with individuals’ motivation to think about cardiovascular health issues, use of health information, and desire to acquire knowledge about the disease (Rimal, 2006). This suggests that messages that include high perceived efficacy components may be relatively more likely to lead to more favorable behavioral outcomes (Bandura, 1997a, 1997b, 1998; Maibach & Murphy, 1995; Rimal, 2006; Witte & Allen, 2000). In order to positively influence behavior, an efficient efficacy message should “convey specific information about learning a health skill or modeling of the behavior” (Moriarty & Stryker, 2008, p. 489) and allow an individual to immediately
perform the recommended behavior without additional steps or information seeking (Maibach & Murphy, 1995; Moriarty & Stryker 2008; Moriarty, 2009).

Research on health content in the media consistently has questioned the potential impact of efficacy messages for influencing health behaviors (see Kline, 2006; Maibach & Murphy, 1995; Witte & Allen, 2000). Although highly consistent and accurate efficacy information has the potential to encourage knowledge acquisition and adaptive health behavior change (Maibach & Murphy, 1995), literature generally posits and supports that efficacy information in health-related media messages is inconsistent and inadequate to induce behavior change (see Kline, 2006). Further, many messages seem to portray an imbalance of threat and efficacy information (see Goodall et al., in press; Moriarty & Stryker, 2008) which can lead to potentially maladaptive implications for health behavior change (Maibach & Murphy, 1995; Witte, 1992; Witte & Allen, 2000). Kline and Mattson (2000) found breast cancer self-examination pamphlets to stress the threat of cancer over efficacy of performing prevention behaviors. In an analysis of the H1N1 epidemic, Goodall et al. (in press) found news articles to adequately portray self-efficacy of individual-level preventive behaviors to avoid the infectious disease and largely underreport response-efficacy (i.e., fail to state that the recommended protective behaviors were effective at averting the threat). Efficacy messages also have been generally absent in U.S. newspaper coverage of cancer; stories tended to provide risk information without discussing skills and behaviors that may help prevent cancer (Moriarty & Stryker, 2008). According to fear processing models (e.g., EPPM, Witte, 1992, Protection Motivation Theory, Rogers, 1975), messages that inadequately present efficacy information may not effectively encourage adaptive behavior change to avert
health threats or manage a disease.

**Disease management efficacy.** Efficacy is an important concept for facilitating knowledge, production, and maintenance of health-related behaviors required for the prevention and management of diseases (Bandura, 1997a; Lorig et al., 1996; Marks & Allegrante, 2005; Rimal, 2006; Strecher, DeVillis, Becker, & Rosenstock, 1986). Behaviors required to prevent and/or manage a disease (e.g., cancer) are different than those required to avert a single health threat (e.g., H1N1) or maintain wellness. Successful chronic disease management requires multiple interventions and the collaboration of patients, health professionals, and organizations (see Ouwens, Wollersheim, Hermens, Hulscher, & Grol, 2002). The long term goal of disease management is to maintain and improve quality of life so that individuals can live with and die with (rather than dying from) their disease (Lorig et al., 1996).

Unfortunately, news messages tend to focus on treatment approaches to disease rather than on specific disease management or preventive behaviors (Rock, 2005; Stryker Emmons, & Viswanath, 2007). Stryker et al. (2007) found newspaper coverage of cancer to discuss treatment more often than prevention and screening. Rather than focusing on medical treatment, diabetes self-management plans (see Lorig et al., 1996) target primary and secondary prevention. Primary prevention in type 2 diabetes is prevention or delay of the onset of the disease (Bowman et al., 2003; CDC, 2011; Dornhorst & Merrin, 1994; Tuomilhetho et al., 2001) through lifestyle modification behaviors including the avoidance of obesity, increased physical activity, dietary modification, and maintaining a healthy pregnancy (Dornhorst & Merrin, 1994; Bowman et al., 2003). Secondary prevention in type 2 diabetes is the prevention of diabetic complications through disease
management (Dornhorst & Merrin, 1994; CDC, 2011; Tuomilhetho et al., 2001) of glucose control, monitoring blood pressure (hypertension), monitoring cholesterol levels, preventive care practices, psychological and emotional management, and communicating with a physician. The final prevention stage of diabetes management is tertiary prevention, which focuses on medical treatment and medical management of diabetic complications (Dornhorst & Merrin, 1994; CDC, 2011; Tuomilhetho et al., 2001).

When disease management is portrayed in the media, it often is presented though metaphors and narratives (Atkin et al., 2008; Stryker et al., 2007). Cancer news stories often use “battle” or “war” metaphors and reference heroism in treating and managing the disease (Clarke & Everest, 2006; Stryker et al., 2007). Living with diabetes has been referred to metaphorically as a “marathon” in that disease management is a long-term endeavor and necessary throughout the life span (see Guccciardi et al., 2008). These disease metaphors represent the difficulty of and perceived barriers to disease management, suggesting that an individual has to be an elite warrior or athlete in order to produce successful health outcomes within his or her chronic condition. Nagelkerk et al. (2006) found that common perceived barriers to type 2 diabetes management are related to adherence issues such as lack of understanding about disease management plan and/or helplessness and frustration from disease progression. The perception of barriers to type 2 diabetes management behaviors has been shown to correlate negatively with self efficacy (see Marks & Allegrante, 2005; Nagelkerk et al., 2006). Maibach and Murphy (1995) suggest that along with self efficacy and response efficacy, effective efficacy messages should attempt to address perceived barriers to enacting health behaviors. Messages that enhance efficacy may help increase adherence to disease management plans that aim to
improve quality of life (see Marks & Allegrante, 2005). Thus, with regard to *efficacy* messages in national print and electronic news coverage of type 2 diabetes mellitus, the following research questions were advanced:

RQ3: What percentage of stories reference *both* threat and efficacy?

RQ4: What percentage of stories reference *response efficacy*?

RQ5: What percentage of stories reference *self efficacy*?

A plan to manage chronic disease often requires components of self-management and the efficacy to modify behaviors and make lifestyle changes (Lorig et al., 1996).

**Messages on Diabetes Self-Management**

Disease management programs and interventions must consider how chronic diseases interact (e.g., diabetes and heart disease often occur simultaneously) and present unique health challenges on the individual level (Clarke, Beckler, Janz, Rakowski, & Anderson, 1991; Lin, Anderson, Chang, Hagerty, & Loveland-Cherry, 2008; Lorig & Holman, 2003; Lorig et al., 1996). Chronic disease management requires the efficacy to produce and reproduce multiple behaviors on a daily basis, most of which must be enacted outside of the primary care setting (Bodenheimer et al., 2002), and affect both short-term and long-term health (Lorig et al., 1996; Marks & Allegrante, 2005). The Chronic Disease Self-Management Program (CDSMP) (Lorig et al., 1996) was the first to address the wide array of variables that may affect disease management.

Guided by the theoretical framework of self-efficacy, the CDSMP teaches individuals three self-management tasks and six self-management skills (Lorig & Holman, 2003; Lorig et al., 1996). CDSMP self-management *tasks* consist of medical management, role management, and emotional management, while self-management
skills consist of problem solving, decision making, resource utilization, forming patient-provider partnerships, action planning, and self-tailoring (Lorig & Holman, 2003; Lorig et al., 1996, p. 7). These tasks and skills combine to help individuals live with a chronic disease. The demonstrated success of the CDSMP approach to improve health outcomes has led to the more thorough development and integration of disease-specific self-management education programs (see Lorig & Holman, 2003).

A primary goal of the National Diabetes Education Program is to communicate that type 2 diabetes is controllable and preventable (U.S. Department of Health and Human Services, 2010c). Type 2 diabetes can largely be prevented and/or delayed through a combination of lifestyle changes and self-management behaviors (Barlow et al., 2002; CDC, 2011; Norris et al., 2001; Tumilhetho et al., 2001). According to the CDC (2011), essential diabetes self-management behaviors include: exercise, weight loss, nutrition, glucose control (checking A1 C levels), blood pressure and cholesterol monitoring, and preventive care practices (e.g., eye, foot, and kidney). Communication with a physician also has been shown to predict favorable diabetes self-management outcomes (Hiesler et al., 2002).

No known research has attempted to understand how news media portray the comprehensive health behaviors required for self-management of type 2 diabetes. Thus, with regard to self-management messages in national print and electronic news coverage of type 2 diabetes mellitus, the following research question was advanced:

RQ6 What percentage of stories reference self-management behaviors of type 2 diabetes mellitus? Is this information consistent with recommendations from the CDSMP and CDC?
Successful chronic disease management requires components of self-management behaviors (Lorig et al., 1996) as well as the efficacy to produce and carry out those behaviors (Bandura, 1997a, 1997b, 1998; Witte, 1992; Witte & Allen, 2000). Thus, the following research question was advanced:

RQ7: What percentage of stories reference both self-management behaviors and self efficacy?

The research questions were answered via a quantitative content analysis of U.S. news media coverage of type 2 diabetes from 2009 to 2011 with the objective of understanding how news messages portray diabetes self-management behaviors and efficacy of disease self-management.
Chapter III

Method

The present study addressed the question: “How do news media portray the self-management behaviors for type 2 diabetes mellitus?” The research involved a quantitative content analysis of U.S. news media coverage of type 2 diabetes from 2009 to 2011 in order to understand how news media portray diabetes self-management behaviors and efficacy of disease management. News stories from 2009 to 2011 on type 2 diabetes mellitus were collected from selected prominent national print and electronic news outlets. The time frame represented a period of increased national attention toward the evolving epidemic (see CDC, 2011). After individually reviewing articles for selection, a quantitative coding instrument was developed and applied to the selected articles.

Article Selection

The author used the LexisNexis database to collect news stories with the subject of diabetes for the time period from January 1, 2009 to January 22, 2011 from seven national print and electronic news outlets (CNN.com, Foxnews.com, Los Angeles Times, MSNBC.com, New York Times, USA Today, and Washington Post). Outlets were selected for their national orientation, widespread readership, and demonstrated potential for stories from these outlets to permeate (be reprinted in and carried by) other print and electronic news sources. In order to account for all references to diabetes, search terms were restricted to source, English, and “diabetes” as a subject listing. Search terms were further restricted to a reference to “diabetes” or “diabetic” in the story headline or lead paragraph in order to better control for these terms appearing in stories in which
discussion was dominated by other diseases (e.g., obesity) and were not central to diabetes. This search process yielded 666 articles.

Inclusion and exclusion criteria were then applied to the story pool. The author reviewed each individual article to ensure that selected articles were U.S. based and centrally-focused on type 2 diabetes and addressed self-management. The study was concerned primarily with examining traditional news stories of medium length (15-18 print column inches) and longer feature-type pieces (see Coleman & Thorson, 2002) because news on chronic disease is typically not front-page coverage or “breaking” in nature (e.g., diabetes coverage may appear most often in a health section or as weekend feature story) (see Adelman & Verbrugge, 2000). Non-traditional news stories such as editorials, letters to the editor, obituaries, and “briefs” (1-2 sentences) were excluded. Stories concentrating on type 1 diabetes were excluded. However, stories on gestational diabetes ($n = 6$) were included because of this population’s high risk for developing type 2 diabetes later in life and similar recommendations for disease self-management (ADA, 2010; CDC, 2011). Stories focusing on type 2 diabetes-specific behaviors able to be performed by an individual outside of the primary care setting (e.g., exercise, weight loss, glucose control) to prevent and/or manage the disease qualified as a discussion of self-management. Stories focusing on treatments other than self-management (e.g., pharmaceutical interventions, such as Avandia ($n = 287$), weight loss surgery) were excluded. All briefs, obituaries, editorials, and announcements were excluded (Coleman & Thorson, 2002; Gollust & Lantz, 2009; Goodall et al., in press). After applying selection criteria, 96 stories comprised the resulting universe of stories addressing self-management for type 2 diabetes. The publication dates in the set of articles for analysis
ranged from January 5, 2009 to January 17, 2011.

**Sample and Coding Procedures**

The universe of 96 stories, constituting approximately 14% of total diabetes stories in time frame, was analyzed. The selection procedure and analysis demonstrate high content validity representing all references to self-management of type 2 diabetes within the selection time frame.

Coding instructions and rules were developed to assist coder training and data entry (see Appendix A). A comprehensive coding system and codebook with definitions and examples was developed (see Appendix B) to assist coders in coding explicit article text into mutually exclusive categories within the variables (Neuendorf, 2002).

**Coder training and coding process.** Each coder received a one hour training session that consisted of reviewing the coding instructions and codebook, discussing questions about codes (e.g., suggestions for improvement regarding clarity), and completing several practice articles. After initial training and demonstrating that the coding system and data entry process was user-friendly, a coding system pilot test was conducted ($n = 15$) to further facilitate and assess coder training. Reliabilities were computed on each variable after the pilot test (average $\alpha = .74$) After analyzing and discussing the results of the pilot test, subsequent adjustments were made to the coding system regarding any problematic measures and/or codes (e.g., examples were added, problem codes were identified and refined). Using the updated coding system, the two trained coders then coded approximately 31% of the selected 96 stories ($n = 30$) until acceptable reliability was reached on each variable ($>.80$ on Krippendorff’s alpha; see Krippendorff, 2004). Krippendorff’s alpha was calculated using an SPSS macro developed by Hayes and Krippendorff (2007). A reliability check was performed half
way through coding \((n = 15)\) and demonstrated acceptable reliabilities on all variables (average \(\alpha = .89\)). Final reliabilities \((n = 30)\) ranged from .84 to .98 (average \(\alpha = .91\), see Table 1). Once acceptable reliability was demonstrated, the remaining stories were coded by a single coder of the original coding team. Coders entered coded article data into a template in *Microsoft Excel*, which was then transferred to *SPSS* for analysis. Descriptive statistics and frequencies were calculated and reported on the variables of interest targeted by the research questions.

**Coding system.** The coding system (see Appendix B) was developed using epidemiologic information from the CDC (2011) and the Chronic Disease Self-Management Program (CDSMP) (Lorig et al., 1996).

**Disease definition.** Stories were coded to indicate whether or not they: (a) defined type 2 diabetes as a disease in which blood glucose levels are above normal (as defined by ADA, 2010; CDC, 2011), (b) differentiated between type 1 and type 2 diabetes, and (c) cited type 2 as the most common form of diabetes (95% of cases, CDC, 2011)

**Susceptibility.** Threat was operationalized through two variables: susceptibility and severity. Susceptibility was defined as making reference to those who are at risk for developing type 2 diabetes as defined by the CDC (2011). Susceptibility was coded as yes or no regarding whether the story referenced each individual risk factor. Diabetes risk factors outlined by the CDC are: (a) age (adolescent = >20 years, adult = 20+ years, or older age = 65+ years), (b) obesity, (c) family history of diabetes, (d) prior history of gestational diabetes, (e) glucose intolerance, (f) physical inactivity, and (g) race/ethnicity. Those at risk for diabetes may experience some or no symptoms (CDC 2011,); therefore, reference to symptoms was coded to indicate if articles: (a) mentioned specific
symptoms, (b) mentioned potential for experiencing no symptoms, or (c) made no mention of symptoms.

**Severity.** Severity was operationalized as the magnitude and/or complications of type 2 diabetes. Severity was coded as yes or no regarding whether the story referenced each individual factor. Examples of magnitude of the disease include references to: (a) diabetes as an epidemic, (b) increasing numbers of diagnosed and undiagnosed cases, (c) costs of the disease, and (d) absence of a cure. Stories were coded as yes or no for reference to the most common severe complications of diabetes as defined by the CDC (2011) including: (a) heart disease and stroke, (b) blindness, (c) kidney disease, (d) hypertension, (e) nervous system disease, (f) non-traumatic lower limb amputations, and (g) death.

**Efficacy.** Efficacy was operationalized as both response efficacy and self-efficacy. Response efficacy was defined as reference to the ability for diabetes and/or its complications to be prevented and/or delayed through recommended self-management behaviors. Self-efficacy was defined as reference to individual abilities to gain the knowledge and problem-solving and coping skills to perform recommended behaviors on his or her own to successfully self-manage the disease (e.g., "You can't let diabetes stop you, but you also don't ignore it. You just have to embrace it and learn how to deal with it.") (CDC, 2011). Efficacy was coded as yes or no regarding whether the story referenced each type of efficacy.

**Self-management.** Self-management was operationalized through reference to both general chronic disease management and diabetes-specific behaviors. Self-management was coded as yes or no regarding whether the story referenced each
individual self-management behavior. Following specific recommendations from the CDSMP (Lorig et al., 1996) and the CDC (2011), self-management was coded as a reference to any and/or all the following behaviors: (a) exercise, (b) weight loss, (c) nutrition, (d) glucose control (checking A1 C levels), (e) monitoring blood pressure, (f) monitoring cholesterol levels, (g) preventive care practices (eye, foot, and kidney), (h) psychological and emotional management, and (i) communicating with a physician.

**Analysis**

Descriptive statistics and frequencies were computed in SPSS and reported for all variables to provide an overall depiction of diabetes self-management and efficacy in national print and electronic news coverage and to answer the posed research questions.
Chapter IV

Results

General Story Characteristics

Of the 96 stories selected for analysis, approximately 27% were from *USA Today*, 26% from *CNN.com*, 22% from *New York Times*, 13% from *Washington Post*, 10% from *Los Angeles Times*, 1% from *MSNBC.com*, and no stories in the analysis came from *Foxnews.com*. Approximately 42% of the stories were from 2009 (*n* = 40), 55% from 2010 (*n* = 53), and 3% from 2011 (*n* = 3, coverage through January 18; see Figure 1).

![Figure 1](image)

*Figure 1.* Timeline of diabetes self-management stories for analysis. This figure demonstrates the number of stories appearing each month from the 2009-2011 (through January 18, 2011) that were included in the analysis.

Approximately 26% of the stories (*n* = 25) appeared in the month of November (2009 and 2010), making this the heaviest month of coverage, while July (2009 and 2010) had
the lightest coverage with approximately 3% of the stories (n = 3, see Figure 1). The spike in coverage for November 2010 may be due in part to the report released by the CDC on October 22, 2010 projecting the number of Americans with diabetes to double or triple by 2050 (Boyle et al., 2010).

**Disease definition.** Analysis investigated whether stories made specific statements that appropriately define type 2 diabetes (e.g., “Insulin, a substance created in the pancreas, moves glucose from the bloodstream into muscles, fat and liver cells. But in type 2 diabetes, the body doesn’t respond to insulin, and glucose builds up in the blood”). Disease definition was assessed through three factors to investigate if stories: (a) defined type 2 diabetes as a disease in which blood glucose levels are above normal (as defined by ADA, 2010; CDC, 2011), (b) differentiated between type 1 and type 2 diabetes, and (c) cited type 2 as the most common form of the disease (95% of cases, CDC, 2011).

Of the three factors within the disease definition variable, approximately 68% of the stories defined type 2 diabetes as a disease in which blood glucose levels are above normal (as defined by ADA, 2011; CDC, 2011), while only 13% of the stories differentiated between type 1 and type 2 diabetes and 22% cited type 2 as the most common form of the disease (95% of cases, CDC, 2011). By combining the three disease definition factors, an aggregate disease definition score was calculated (M = 1.03, SD = .91, range = 0-3) demonstrating that stories referenced an average of approximately one out of a possible three definition-related factors.

**Susceptibility**

Research question one asked what percentage of stories reference susceptibility to type 2 diabetes mellitus. A susceptibility variable was defined as references to both risk
factors for developing type 2 diabetes and the potential to experience some or no symptoms of the disease (see Table 2.)

**Risk factors.** Risk factors of type 2 diabetes were assessed through seven key factors as outlined by the CDC (2011): (a) age (adolescent ≥20 years, adult = 20+ years, or older age = 65+ years), (b) obesity, (c) family history of diabetes, (d) prior history of gestational diabetes, (e) glucose intolerance, (f) physical inactivity, and (g) race/ethnicity (e.g., “But the risk increases with a family history of diabetes, previous gestational diabetes, age over 25, obesity and membership in certain groups -- Hispanic, Native American, black or Asian;” see Figure 2).

The vast majority of the stories (95%) reported at least one risk factor for developing type 2 diabetes. Among the seven key risk factors for developing type 2 diabetes, the most commonly referenced risk factors were glucose intolerance (approximately 74%) and obesity (approximately 56%, see Table 2). Additionally, approximately 53% of the stories referenced at least one specific age group as being at risk for diabetes. Prior history of gestational diabetes was the least commonly referenced risk factor in the stories (approximately 12%). An aggregate risk-factor score was calculated \( M = 2.64, SD = 1.66, \text{range} = 0-7 \) demonstrating that stories referenced an average of approximately three out of a possible seven risk factors for developing type 2 diabetes.

**Symptoms.** With regard to susceptibility to experience symptoms of type 2 diabetes (see Figure 2), approximately 16% of the stories referenced specific symptoms of diabetes (e.g., “I was in really good shape, but I was thirsty all the time. And I had to go to the bathroom every half-hour. I know now these are classic symptoms of
diabetes.”), while 6% stated that those at risk for diabetes may experience no symptoms. The vast majority of the stories (approximately 84%) made no reference to symptoms of diabetes.

Figure 2. Susceptibility-related factors for type 2 diabetes. This figure demonstrates the percentage of stories that referenced susceptibility-related factors, risk and symptoms experienced, for type 2 diabetes.

Severity

Research question two asked what percentage of stories reference severity of type 2 diabetes mellitus. Severity was defined as references to magnitude-related factors and to complication-related factors of type 2 diabetes (see Table 3 for a summary of all severity findings).

Magnitude-related factors. Magnitude of type 2 diabetes was assessed through four factors as references to: (a) diabetes as an epidemic, (b) increasing numbers of
diagnosed and undiagnosed cases, (c) costs of the disease, and (d) absence of a cure (e.g., "Diabetes is the noninfectious epidemic of our time"). Slightly more than half of the stories (57%) referenced at least one magnitude-related factor of type 2 diabetes. Of the four magnitude-related factors assessed (see Figure 3), few of the stories cited diabetes as an epidemic (approximately 12%) and even fewer referenced the absence of a cure for type 2 diabetes (approximately 8%). By combining the four magnitude-related factors, an aggregate magnitude score was calculated ($M = .85, SD = .90, \text{range} = 0-4$) demonstrating that stories referenced an approximate average of one out of a possible four magnitude-related factors.

<table>
<thead>
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<td>Epidemic</td>
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</tr>
<tr>
<td>Increasing Number of Cases</td>
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</tr>
<tr>
<td>Economic/Individual Costs</td>
<td>20%</td>
</tr>
<tr>
<td>No Cure</td>
<td>8%</td>
</tr>
</tbody>
</table>

*Figure 3.* Magnitude-related factors for severity of type 2 diabetes. This figure demonstrates the percentage of stories that referenced the magnitude of type 2 diabetes.

**Complication-related factors.** Complications of type 2 diabetes were assessed through seven factors as references to: (a) heart disease and stroke, (b) blindness, (c) kidney disease, (d) hypertension, (e) nervous system disease, (f) non-traumatic lower limb amputations, and (g) death (e.g., “... to minimize the complications associated with diabetes including heart disease, kidney disease, eye problems and infection, it is
important to keep blood sugar levels as steady as possible throughout the day.”
Approximately 70% of stories referenced at least one complication-related factor of type 2 diabetes. Of the seven complication-related factors assessed (see Figure 4), the most commonly referenced complications were heart disease and/or stroke (approximately 52%) and kidney disease (approximately 34%). Relatively fewer stories referenced death as a complication of type 2 diabetes (approximately 23%). By combining the seven complication-related factors, an aggregate complication score was calculated ($M = 1.97$, $SD = 1.81$, range = 0-6) demonstrating that stories referenced an approximate average of two out of a possible seven complication-related factors.

![Complication-related factors for severity of type 2 diabetes](image)

*Figure 4. Complication-related factors for severity of type 2 diabetes. This figure demonstrates the percentage of stories that referenced the complications of type 2 diabetes.*

A substantial majority of stories (84%) referenced at least one severity-related factor of type 2 diabetes (i.e., one magnitude or complication factor). By combining the four magnitude-related factors and seven complication-related factors, an aggregate
severity score was calculated ($M = 2.83$, $SD = 2.19$, range =0-8) demonstrating that stories referenced an average of approximately three out of a possible eleven severity-related factors (see Table 3 for a summary of all severity findings).

**Efficacy**

Research question three asked what percentage of stories reference both threat and efficacy of type 2 diabetes mellitus. Efficacy was assessed as reference to both response efficacy and self-efficacy of self-management in type 2 diabetes.

**Response efficacy.** Research question four asked what percentage of stories reference response efficacy of type 2 diabetes mellitus. Response efficacy was assessed as an explicit reference to the ability for diabetes and/or its complications to be prevented and/or delayed through recommended self-management behaviors (e.g. “The onset of diabetes was delayed by about four years for people who had made lifestyle changes . . .”). Approximately 27% of the stories referenced response efficacy.

**Self-efficacy.** Research question five asked what percentage of stories reference self-efficacy of self-management in type 2 diabetes mellitus. Self-efficacy was assessed as a reference to individual abilities to gain the knowledge and problem-solving and coping skills to perform recommended behaviors on his or her own to successfully self-manage the disease (see Bandura, 1997a; Lorig et al., 1996; CDC, 2011) (e.g. “You can't let diabetes stop you, but you also don't ignore it. You just have to embrace it and learn how to deal with it”). Approximately 45% of stories contained at least one self-efficacy statement with regard to diabetes self-management. Results indicate that approximately 18% ($n = 17$) of stories referenced both response efficacy and self-efficacy (see Figure 5).
Figure 5. Efficacy for self-management of type 2 diabetes. This figure demonstrates the percentage of stories that referenced response efficacy, self-efficacy, and both types of efficacy for self-management of type 2 diabetes.

**Self-Management**

Research questions six and seven referenced depictions of self-management behaviors. Self-management was assessed through key chronic disease management and diabetes-specific behaviors (e.g., “Many people control their diabetes through proper diet and exercise, and thrive without medication”).

**Self-management terminology.** Research question six asked what percentage of stories reference *self-management* behaviors of type 2 diabetes mellitus. Analysis investigated whether stories explicitly used *self-management* and/or *self-care* terms. Results indicate that 1% (n = 1) of the stories explicitly referenced “self-management” and/or “self-care” terms (see Table 4). The only story in the sampled that used these terms did so by referencing *self-monitoring* of blood glucose, which refers to a singular behavior rather than comprehensive disease self-management (e.g., “People with type 2 diabetes are often advised to use blood-glucose test strips to monitor their blood sugar”.

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<table>
<thead>
<tr>
<th>Efficacy Type</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Response-Efficacy</td>
<td>27%</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>45%</td>
</tr>
<tr>
<td>Both</td>
<td>18%</td>
</tr>
<tr>
<td>Neither Efficacy</td>
<td>46%</td>
</tr>
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levels, but . . . routine self-monitoring is not cost-effective for many patients: the strips can cost almost a dollar each, and they prevent comparatively few complications of diabetes”.

**Self-management behaviors.** Following specific recommendations from the CDSMP (Lorig et al., 1996) and the CDC (2011), self-management was assessed as a reference to any or all the following behaviors: (a) exercise, (b) weight loss, (c) nutrition, (d) glucose control (checking A1C levels), (e) monitoring blood pressure, (f) monitoring cholesterol levels, (g) preventive care practices (eye, foot, and kidney), (h) psychological and emotional management, and (i) communicating with a physician.

Nearly all of the stories (95%) referenced at least one self-management behavior related to type 2 diabetes. Of the nine self-management behaviors assessed (Figure 6, Table 4), glucose control (approximately 74%) and nutrition (approximately 63%) were referenced most often as self-management behaviors followed by exercise (approximately 57%) and weight loss (approximately 43%). Few articles referenced managing the psychological and emotional aspects of a chronic disease as recommended behavior for diabetes self-management (approximately 11%).

By combining the self-management terminology factor and the nine self-management behavior-related factors, an aggregate self-management score was calculated ($M = 3.16, SD = 1.65, range = 0-8$) demonstrating that stories referenced an average of approximately three out of a possible ten self-management-related factors.
Figure 6. Self-management behaviors for type 2 diabetes. This figure demonstrates the percentage of stories that referenced self-management behaviors for type 2 diabetes as recommended by the CDSMP (Lorig et al., 1996) and the CDC (2011).

Research question seven asked what percentage of stories reference both self-management behaviors and efficacy. Results indicate that 45% of stories referenced at least one self-management behavior and one self-efficacy statement. Additionally, approximately 38% of stories referenced three or more self-management factors and at least one self efficacy statement. However, only approximately 13% stories referenced three or more self-management factors and both self-efficacy and response efficacy (e.g., “You can delay many complications of diabetes through weight loss with proper diet and exercise and by controlling your blood sugar levels”).
Chapter V

Discussion

The present study is the only known investigation that speaks to the mechanism by which news message content may influence the comprehensive adaptive behavior changes required for self-management of type 2 diabetes. Self-management interventions for type 2 diabetes are attractive because of their potential to positively affect health outcomes and reduce health care costs (Bodenhiemer et al., 2002; Lorig & Holman, 2003; Lorig et al., 1996) in a disease in which incidence rates, mortality, and prediabetes prevalence is predicted to exponentially increase in the U.S. adult population through the year 2050 (Boyle et al., 2010; U.S. Department of Health and Human Services, 2010b). News media have the potential to play an important role in health behavior change by informing the public (Berry et al., 2007; Brodie et al., 2003; Goodall et al., in press; Pierce & Gilpin, 2001), modeling behaviors to avoid health threats (Mebane et al., 2003), and encouraging disease prevention and management (Moriarty & Stryker, 2008; Rock, 2005; Schwartz & Woloshin, 2002; Yanovitsky & Blitz, 2000).

The universe of 96 stories on type 2 diabetes self-management, constituting approximately 14% of total diabetes stories from high-profile sources in the study time frame of 2009 to 2011, was analyzed. News stories rarely address self-management in type 2 diabetes. Findings suggest that due to the nature of the news coverage in terms of threat and efficacy factors that does address self-management behaviors for type 2 diabetes mellitus, it likely fails to meet its health-related potential to influence adaptive behavior change for primary and secondary prevention. A combination of lifestyle intervention and self-management is the most medically efficacious and cost-effective
strategy for preventing and treating type 2 diabetes (ADA, 2010; CDC, 2011; Norris et al., 2001), yet of the diabetes news coverage in the study time frame, less than 5% of stories contained complete discussions of self-management behaviors related to primary and secondary prevention and only one news story explicitly used self-management or self-care terminology. (The specific term used in this story was “self-monitoring”.)

The low amount of news coverage on self-management for prevention suggests that news media do not place emphasis on prevention of type 2 diabetes as a newsworthy topic. This lack of coverage reveals type 2 diabetes prevention as voiceless. Substantive news messages on self-management for prevention generally do not exist. The study's results are summarized and discussed within the context of the finding that little discussion of diabetes self-management occurs in news coverage. Results have potential implications for giving voice to prevention in type 2 diabetes and related chronic diseases such as obesity, heart disease and stroke.

**Summary of Study Findings and Implications**

News media are a major source of health information for providers, patients, and the general public (Brodie et al., 2003; Gollust & Lantz, 2009; Kline, 2006; Manganello & Blake, 2010; Meissner et al., 1992; Phillips et al., 1991). News media can affect health-related public opinion (Brännstrom & Lindbald, 1994; Gollust, Lantz, & Ubel, 2009; McCombs, 2002) and public policy (Brodie et al., 2003; Yanovitzky, 2002), and individuals' health-related decisions (Slater et al., 2007; Stryker, 2003; Yanovitzky & Bennet, 1999; Yanovitzky & Blitz, 2000). This research addressed the question: “How do news media portray the self-management behaviors for type 2 diabetes mellitus?”
**Disease definition.** Providing an accurate definition of illness and disease and using consistent disease terminology is important in news stories (see Goodall et al., in press) because of their potential to influence health risk-perceptions and concerns (see Slater et al., 2009; Slater et al., 2007) and, in turn, health behavior (see Pierce & Gilpin, 2001). The majority of the analyzed stories (approximately 68%) accurately defined type 2 diabetes as a disease in which blood glucose levels are above normal as defined by ADA (2011) and CDC (2011). However, only 13% of the stories differentiated between type 1 and type 2 diabetes and only 22% cited type 2 diabetes as the most common form of the disease (95% of cases; CDC, 2011). Both of these findings may be attributed to an assumption made by news media that type 2 diabetes has reached a “maturity” stage (e.g., diabetes is not an emerging threat or a new and unknown disease; see Adelman & Verbrugge, 2000) as a news topic and the general public has prior knowledge of the definition of the disease. Differentiating between type 1 and type 2 diabetes is especially important because, although type 1 typically has been known as juvenile-onset diabetes, the prevalence of type 2 diabetes in children and adolescents (and adults) is dramatically increasing (CDC, 2011).

Although 64% of the stories referenced adults (age 20 +) as being at risk for type 2 diabetes and 19% of the stories referenced adolescents as at risk, 17% of stories omitted age as a risk factor. Poor definitional representation of diabetes may distort perceptions of disease-related threat (severity and susceptibility) and contribute to significantly underestimating the risks of type 2 diabetes. Providing a clear distinction between type 1 and type 2 diabetes may reduce public misconceptions about age-related risk factors for each disease type and encourage prevention awareness for type 2 diabetes in adolescents.
as well as adults. News stories that accurately define type 2 diabetes have the potential to evoke more accurate perceptions of health risk disease-related threat (see Goodall, et al., in press; Slater et al, 2009; Slater et al., 2007). In turn, individuals are more likely to make adaptive behavior changes when a health-related message includes an accurate and relevant portrayal of threat (Brodie et al., 2003; Witte, 1992; Witte & Allen 2000).

**Threat.** The diabetes epidemic is a threat central to the U.S. health agenda (U.S. Department of Health and Human Services, 2010b). According to EPPM, when a message elicits a high threat appraisal, an individual perceives that something is likely to cause harm (e.g., diabetes) and responds by seeking to protect him- or herself from danger (e.g., starting a diet and exercise plan; Witte, 1992; Witte & Allen, 2000). The EPPM operationalizes threat through two variables: susceptibility and severity. Although the EPPM was not experimentally tested in the present analysis, general conclusions are drawn about the potential amount of threat (severity and susceptibility) referenced by the stories.

**Susceptibility.** The present study defined susceptibility as references to risk factors for developing type 2 diabetes and the potential for individuals to experience some or no symptoms of the disease. The majority of the analyzed stories accurately highlighted glucose intolerance (74%), obesity (56%), and age (56% citing at least one age group) most often as risk factors for developing type 2 diabetes. The stories referenced an average of approximately four out of a possible seven risk factors. Coverage generally neglected important genetic and environmental risk factors as cited by CDC (2011), with about a quarter of the analyzed stories referencing family history.
(26%) and physical inactivity (24%), and fewer referencing race/ethnicity (20%) or prior history of gestational diabetes (12%) as type 2 diabetes risk factors.

Given that so few of the analyzed stories provided information on the symptoms of type 2 diabetes (84% made no mention of symptoms), the findings suggest that the news stories may not provide adequate coverage to increase the public’s knowledge about the variety, seriousness, or incidence of diabetes symptoms. Diabetes is known as a “silent killer” (Campbell, 2001) because often no obvious symptoms occur, which contributes to late diagnosis or allows the disease to remain undiagnosed. Failure to voice the possible symptoms of type 2 diabetes may reinforce type 2 diabetes as a “silent killer” (Campbell, 2001), and further contribute to the disease progressing undiagnosed.

**Severity.** Disease severity can be understood in terms of its magnitude. The present study defined severity as references to magnitude-related factors and complication-related factors of type 2 diabetes. Few stories reported two key magnitude factors of type 2 diabetes: approximately 12% of the stories referenced diabetes as an epidemic and even fewer referenced the absence of a cure for type 2 diabetes (approximately 8%).

The severity of a disease can also be understood in terms of its costs. Diabetes is a significant financial burden to the nation through both direct medical costs and indirect costs to diagnosed individuals, families, insurers, employers, and U.S. taxpayers (ADA, 2008; Boyle et al., 2010). However, only 20% of stories referenced the economic and/or individual costs of diabetes. Stories that include more information on the financial cost of diabetes may better portray the magnitude of impact of the disease to individuals and
policy makers as health care costs attributed to diabetes continue to rise (Hogan et al., 2002).

With the exception of death (23%), the complication-related factors of type 2 diabetes generally were portrayed in terms of the most to least commonly occurring complications. Heart disease and/or stroke (52%) were referenced most often, followed by kidney disease (34%), blindness (29%), and hypertension (23%). Nervous system damage (17%) and non-traumatic lower limb amputations (20%) were mentioned less often. However, only half of the analyzed stories mentioned heart disease and/or stroke even though these diseases often occur simultaneously with diabetes and therefore need to be addressed in disease management. The stories underreported diabetes-related death. As noted above, only 23% of the stories mention death as a complication of diabetes even though diabetes is the seventh leading cause of death in the U.S. (CDC, 2011). This finding contributes to previous literature that suggests that news media tend to emphasize mortality caused by acute diseases, illnesses, and/or emerging threats (Adelman & Verbrugge, 2000; Armstrong et al., 2006; Goodall et al., in press; Freimuth, 2006) rather than slowly-developing chronic diseases (Armstrong et al., 2006). The underreporting of diabetes-related death along with the underreporting of magnitude and complication-related factors may serve to perpetuate the public’s perception that diabetes is a “mild disease” (i.e., that it is not immediately life-threatening; Campbell, 2001).

As a result of not including magnitude-related factors and death as a complication of diabetes in news stories, news coverage may not be evoking sufficiently high threat to capture the public’s attention. That is, the EEPM suggests that low perceived threat of diabetes cannot encourage the knowledge acquisition and preventive behaviors necessary
to avoid the threat posed by diabetes. The majority of research supports that the most effective messages for encouraging adaptive behavior change are high in both threat and efficacy (Floyd et al., 2000; Leventhal, 1970; Maibach & Murphy, 1995; Moriarty & Stryker, 2008; Roberto & Goodall, 2009; Rogers, 1975; Roskos-Ewoldsen et al., 2004; Witte & Allen, 2000).

**Efficacy.** Rogers and Witte propose that *both* response efficacy and self-efficacy are necessary to motivate protective action (e.g., EPPM, Witte, 1992; Protection Motivation Theory, Rogers, 1975). *Response-efficacy* is the belief that a threat can be deterred or reduced by following a recommended action (e.g., diabetes can be prevented through lifestyle change) (Bandura, 1998). *Self-efficacy* is an individual’s belief about his or her ability to carry out the recommended action (Bandura, 1998). Although not addressed by the present study, Maibach and Murphy (1995) suggest that along with self efficacy and response efficacy, effective efficacy messages should attempt to address perceived barriers to enacting health behaviors. Messages that enhance efficacy may help increase adherence to disease management plans that aim to improve quality of life (see Marks & Allegrante, 2005). Analyses investigated references to both response efficacy and self-efficacy.

**Response efficacy.** The present study defined response efficacy as an explicit reference to the ability for diabetes and/or its complications to be prevented and/or delayed through recommended self-management behaviors. Similar to the findings of Goodall et al. (in press), stories in the analysis generally lacked reference to response efficacy. Approximately 27% of stories explicitly stated that type 2 diabetes can be prevented and/or delayed through recommended lifestyle change and self-management
behaviors. This is inconsistent with the recommendations of models of fear appeal message processing (Rogers, 1975; Witte, 1992, Witte & Allen, 2000). Thus, the relative lack of reference to response efficacy in the stories about self-management in type 2 diabetes may fail to effectively encourage sufficient knowledge acquisition and adaptive behavior change to prevent or delay the onset of diabetes or diabetes-related complications.

**Self-efficacy.** The present study defined self-efficacy as a reference to individual abilities to gain the knowledge and problem-solving and coping skills to perform recommended behaviors on *his or her own* to successfully self-manage the disease (Lorig et al., 1996; CDC, 2011). Individuals are likely to make behavioral modifications in response to a threat if the message includes efficacy information. Less than half of the stories (43%) referenced self-efficacy of diabetes self-management.

The EPPM suggests that *both* response efficacy and self-efficacy must be present in a message to motivate protective action (Witte, 1992). However, only 18% of the stories referenced *both* response efficacy and self-efficacy. This is problematic. A successful self-management plan to manage diabetes (or any chronic disease) requires the efficacy to initially modify behaviors and make lifestyle changes and then continued efficacy to perform a complex combination of behaviors on a daily basis (Lorig et al., 1996; Nagelkerk, et al., 2006). As the behaviors required for diabetes self-management are comprehensive, efficacious messages should convey specific and accurate information related to enacting multiple diabetes behaviors at once (e.g., controlling blood glucose through diet, exercise, nutrition, and careful monitoring), rather than a single behavior (e.g., checking blood glucose), and do so in a way that targets efficacy for
prevention longitudinally throughout the progression of the disease (see Lorig et al., 1996; Maibach & Murphy, 1995; Moriarty & Stryker, 2008; Moriarty, 2009; Nagelkerk et al., 2006). This is no doubt a challenge for health communicators and practitioners to achieve in planned health-related messages and multi-component campaigns, let alone for news media and journalists as part of routine reporting. However, this may be the most effective way to present efficacy in messages on chronic disease and encourage complex adaptive behavior change in accordance with message recommendations.

**Self-management as prevention for type 2 diabetes.** The present study defined self-management through both general chronic disease management and diabetes-specific behaviors as outlined by the CDSMP (Lorig et al., 1996) and the CDC (2011). The goal of efficacious self-management is for an individual to be capable and competent in improving his or her quality of life through self-regulation of disease (Barlow et al., 2002; Lorig, et al., 1996; Marks & Allegrante, 2005). A self-management plan is the most medically efficacious and cost effective strategy to prevent and/or delay disease onset, complications, and disease progression in type 2 diabetes (ADA, 2010; CDC, 2011; Norris et al., 2001). Thus, self-management findings from the present analysis can best be understood through the lens of primary and secondary prevention behaviors for type 2 diabetes. Healthy People 2020 (U.S. Department of Health and Human Services, 2010b) focuses several national objectives on diabetes prevention.

**Primary prevention behaviors.** Primary prevention in type 2 diabetes is prevention or delay of the onset of the disease through lifestyle modification (Bowman, et al., 2003; Dornhorst & Merrin, 1994; CDC, 2011; Tuomilhetho et al., 2001). Following the recommendations of Dornhorst and Merrin (1994), the present study defined primary
prevention behaviors for type 2 diabetes as weight loss (the avoidance of obesity), exercise (increased physical activity), and nutrition (dietary modification). Nutrition (approximately 63%) was referenced most often as a self-management behavior for primary prevention. Interestingly, as noted above, approximately 56% of the stories referenced obesity as a risk factor for diabetes; however, only approximately 43% of the stories cited weight loss as a self-management behavior. In contrast, approximately 57% of the stories referenced exercise as a key self-management behavior while 24% of the stories cited physical inactivity as a risk factor for diabetes. These findings demonstrate an imbalance between news coverage of risk factors for type 2 diabetes and the related primary prevention behaviors to avert risk. Only 31% of the analyzed stories referenced all three primary prevention behaviors (weight loss, exercise, and nutrition) for the self-management of type 2 diabetes.

In order to place the present results in the larger context of all diabetes news coverage, consider that of all 666 stories discussing diabetes in the present study time frame, only approximately 5% contained complete discussions of self-management for primary prevention. A complete discussion of primary prevention should include the three self-management behaviors of weight loss, exercise, and nutrition because of the potential for this combination of behaviors to prevent and delay the onset of diabetes (CDC, 2011). The low amount of news coverage on self-management for primary prevention suggests that news media do not place emphasis on primary prevention of type 2 diabetes as a newsworthy topic. This finding accents the voiceless nature of prevention messages in type 2 diabetes.
Secondary prevention behaviors. Secondary prevention in type 2 diabetes is the prevention of diabetic complications and is followed by tertiary prevention which concerns the medical treatment of diabetic complications (Bowman et al., 2003; Dornhorst & Merrin, 1994; CDC, 2011; Tuomilheto et al., 2001). (Note that tertiary prevention was not included in the present analysis because it implies medical treatment beyond the realm of self-management.) Following the recommendations of Dornhorst and Merrin (1994) and Bowman et al., (2003), the present study defined secondary prevention behaviors for type 2 diabetes as glucose control, monitoring blood pressure (hypertension), monitoring cholesterol levels, preventive care practices, psychological and emotional management, and communicating with a physician.

Glucose control was the most commonly referenced self-management behavior (approximately 74% of analyzed articles). This finding suggests that this particular secondary prevention behavior (glucose control) for type 2 diabetes is portrayed in news coverage of self-management more often than primary prevention behaviors. This result has potential implications for the way individuals perceive type 2 diabetes as a disease in which the onset can be prevented or delayed. For example, individuals with pre-diabetes may perceive a diabetes diagnosis as inevitable and subsequently not enact primary prevention behaviors due to news coverage placing a greater emphasis on secondary prevention than on primary prevention of type 2 diabetes.

Aside from glucose control, other secondary prevention behaviors for self-management of type 2 diabetes were little reported. Less than 20% of analyzed stories referenced monitoring blood pressure (approximately 17%), monitoring cholesterol levels (approximately 17%), or preventive care practices (approximately 10%). The most
common perceived barriers to type 2 diabetes management are related to adherence issues such as lack of understanding about disease management plan and/or experiencing helplessness and frustration resulting from disease progression (Nagelkerk et al., 2006). However, few (11%) stories referenced managing the psychological and emotional aspects of a chronic disease as recommended behavior for diabetes self-management. Additionally, few stories made reference to the importance of communicating with a physician (approximately 21%) as part of a diabetes self-management plan. Thus, both the barriers to enacting self-management behaviors and the importance of physician-patient communication for maintaining a self-management plan are voiceless aspects of type 2 diabetes.

Few of the analyzed stories (approximately 18%) referenced three or more self-management behaviors related to secondary prevention. In other words, of all 666 stories discussing diabetes in the present study time frame only approximately 3% referenced multiple self-management behaviors related to secondary prevention. The generally poor representation of secondary prevention in diabetes news coverage of self-management is not likely to facilitate the knowledge acquisition and encourage adaptive behavior change required for pre-diabetics and diabetics to manage their disease in a way that prevents complications and improves quality of life. These messages also have the potential to reduce the perceived importance of primary and secondary prevention and encourage maladaptive behavior in disease management. Thus, news coverage of self-management may inadvertently imply that tertiary prevention, or the medical treatment of diabetes complications, is the sole and most effective approach for managing type 2 diabetes. In addition to the demonstrated lack of coverage on prevention in type 2 diabetes, existing
prevention messages are inverted emphasizing tertiary prevention, effectively drowning out the relatively quiet voice for primary and secondary prevention. Indeed, 287 articles in the study time frame focused their headline and lead paragraph on treating diabetes with pharmaceutical interventions such as Avandia.

**News coverage of self-management.** Of the 666 stories referencing type 2 diabetes in the study time frame of 2009 to 2011, only 96 stories (approximately 14%) discussed self-management and were included in the analysis. Thus, a small amount of news coverage in the analysis time frame was attributed to self-management of type 2 diabetes. This speaks to the low emphasis placed on self-management by news media as a newsworthy topic.

By providing so little coverage and discussion of self-management behaviors, the news media additionally neglect primary and secondary prevention for type 2 diabetes. Consistent with agenda setting literature (see Cohen, 1963; Iyengar & Kinder, 1987; McCombs, 2002; McCombs & Shaw, 1972), this finding suggests that although the topic of diabetes may be salient on the public agenda (see Gollust & Lantz, 2009), self-management as a prevention strategy for the disease is not.

Results indicate that news coverage that does address self-management of type 2 diabetes likely *does not* achieve its health-related potential (e.g., see Atkin et al., 2008; Berry et al., 2007; Goodall et al., in press; Moriarty & Stryker, 2008). The results support previous research indicating that news media coverage of chronic diseases lacks adequate efficacy messages (Mercado-Martinez et al., 2001; Moriarty & Stryker, 2008) to effectively promote health behaviors and infrequently discuss prevention (Moriarty & Stryker, 2008; Stryker et al., 2007). News coverage included in the present analysis
primarily used *treatment* terminology (61% of analyzed stories referenced treatment) when discussing management of type 2 diabetes rather than *prevention* terminology (27% of analyzed stories referenced prevention; see Stryker et al., 2008). By omitting key self-management information, news media coverage may misrepresent and/or underrepresent one of the most medically and cost-effective strategies for preventing and treating diabetes (ADA, 2008; Barlow et al, 2002; CDC, 2011). News coverage of type 2 diabetes may not be providing sufficient self-management and efficacy information needed to encourage prevention-related knowledge acquisition and/or adaptive health behavior change among both those at risk for diabetes (including undiagnosed and diagnosed prediabetes) and/or those living with diabetes (i.e., undiagnosed and diagnosed cases).

**Study Limitations**

Several limitations should be noted when considering the reported results. First, the stories included in the analysis are from 2009 to 2011. The findings cannot be generalized to longer-term and/or longitudinal trends in type 2 diabetes news coverage. Second, the analysis is limited to news media coverage in national print and electronic newspapers and thus does not represent news trends in other communication media and outlets (e.g., television, magazines, internet sites, and social media). However, the selected national newspaper outlets included in the analysis provide a universal representation of type 2 diabetes news coverage due to the potential broad reach and influence of the content disseminated by these outlets (including influence on other news and popular media outlets). Finally, because the present study was not experimental, it does not address if the public attends to diabetes self-management messages or exactly if and how the public is affected and/or influenced by these messages. Future experimental
research is needed to understand how diabetes disease self-management messages influence perceptions of threat and efficacy and, in turn, affect health-related preventive behaviors.

**Conclusion and Future Research**

Type 2 diabetes is a newsworthy topic because of the largely preventable threat it poses to the U.S. public health and economy (see Boyle et al., 2010; CDC, 2007). With increasing rates of chronic disease (Boyle et al., 2010; CDC, 2011) and rising costs of chronic disease care (ADA, 2008; Boyle et al., 2010; CDC, 2007; Hogan et al., 2003), self-management interventions are attractive because of their potential to positively affect health outcomes and reduce health care costs (Bodenhiemer et al., 2002; Lorig & Holman, 2003; Lorig et al., 1996). Primary and secondary prevention through self-management is the most medically efficacious and cost effective strategy for treating type 2 diabetes (ADA, 2010; Bowman et al., CDC, 2011; Dornhorst & Merrin, 1994; Norris et al., 2001; Tuomilhetho et al., 2001).

The present research demonstrates the value of operationalizing components of the EPPM in order to understand and improve upon how news messages deliver prevention information with the potential to influence health behavior in chronic disease. News media may potentially be the most efficient way to deliver diabetes prevention information to the public because the current health care system in the U.S. is not designed to deliver or capable of delivering lifestyle intervention programs for the population of people with type 2 diabetes (see CDC, 2004). Using the EPPM as a guiding framework, the findings of this study help to illustrate how health professionals and
health communication researchers can encourage more effective health and prevention promoting messages for type 2 diabetes through news media.

The major findings and implications discussed here also may be true for other chronic diseases, particularly chronic diseases that coincide with type 2 diabetes (known as co-morbidity, CDC, 2011) such as heart disease, stroke, and/or obesity. The co-morbidity of these chronic diseases presents unique and complex challenges to disease self-management and health behavior change as well as reporting challenges for news media and journalists. The present study notes that type 2 diabetes should not be investigated as a singular chronic disease when researching news messages on self-management behaviors and efficacy. Thus, future research should incorporate a wide perspective that considers the interaction among chronic diseases and the influence this interaction has on self-management, primary and secondary prevention, and health behavior change. Future research, both non-experimental and experimental, of media messages from this broader multiple-disease perspective would contribute greatly to understanding the potential influence health-related media messages may have on health behavior change and self-management in chronic disease prevention.

**Giving voice to prevention in type 2 diabetes.** At present, little news appears to cover self-management of type 2 diabetes. News coverage that does occur may be causing the public to misunderstand the threat of type 2 diabetes and fail to hear the muted voice for self-management as an approach for primary and secondary prevention. Results of the present study point to inconsistencies in diabetes news coverage that journalists can address, messages and behaviors that health care professionals, health educators, and health communicators need to reinforce, and questions about the potential
influence incidental messages have on behavior that health communication researchers need to answer. First, all of these groups need to be providing a clear definitional distinction between type 1 and type 2 diabetes to reduce public misconceptions about age-related risk factors for each disease type and encourage prevention awareness for type 2 diabetes in adolescents as well as adult age groups. By reducing public misunderstanding likely perpetuated by news messages, journalists, health care professionals, health educators and communicators, and health communication researchers may be able to encourage diabetes self-management behaviors and positively influence diabetes-related health outcomes.

Journalists and those who train journalists (see Viswanath et al., 2008) need to strive to increase coverage about the variety, seriousness, or incidence of diabetes symptoms, magnitude-related factors, and death as a complication of diabetes, which may help news coverage evoke higher perceived threat of diabetes to the public. By incorporating diabetes self-management news messages that contain both response efficacy and self-efficacy, journalists may help strengthen both the initial and longitudinal efficacy required by individuals to modify behaviors, make lifestyle changes, and adhere to a diabetes (or any chronic disease) self-management plan. Additionally, working to correct the generally poor representation of primary and secondary prevention in diabetes news coverage of self-management may more effectively encourage the public to make more diabetes prevention-related lifestyle changes to manage the disease in a way that reduces risk, prevents complications, and improves quality of life.

Specifically, results of the present analysis inform health care providers, health educators, and public health professionals about messages that the public is unlikely to
have encountered through everyday news coverage and that especially need to be reinforced in the primary care setting. Health care professionals and health educators and communicators can give voice to prevention in type 2 diabetes by reinforcing messages and behaviors related to efficacy, self-management, and primary and secondary prevention with diabetes patients (e.g., see Lorig & Holman, 2003; Maibach & Murphy, 1995). These messages also need to be echoed if not trumpeted beyond the primary care setting, in community settings (e.g., see Renders, Valk, Griffin, Wagner, Eijik, & Assendelft, 2001), news media, and public policy. Public health communication specialists are in a position to give voice to prevention in type 2 diabetes through the use of media advocacy to increase news media coverage of diabetes self-management and the implementation of a strategic health communication campaign to brand and increase awareness of self-management related terminology and behaviors which have the potential to make diabetes self-management more salient in the news media, on the public agenda, and in public policy.

The results of the present analysis highlight questions that health communication researchers need to answer. These questions have implications for applying theory to understanding the perceptual and behavioral impact of incidental messages on prevention associated with type 2 diabetes and with chronic disease in general.

First, how can new applications of existing theoretical message frameworks contribute to the understanding of health messages and messages potential influence on behavior? Guided by Witte’s (1992) extended parallel processing model, the present study implemented a “systematic and replicable” (Riffe et al., 1998, p. 20) quantitative content analysis (Krippendorff, 2004; Manganello & Blake, 2010; Neuendorf, 2002).
Future studies may consider further non-experimental and experimental application of message processing frameworks to understand the actual impact of messages on knowledge acquisition and behavior change associated with diseases that require comprehensive disease management behaviors.

Second, how do incidental messages, like news coverage, encourage or fail to encourage prevention and self-management of chronic diseases that threaten the U.S. public health? Prevention and self-management are becoming increasingly important in objectives for improving the public health of the nation (e.g., see U.S. Department of Health and Human Services, 2010b). The present study reveals a need for experimental studies that contribute a scientific understanding of how communication, intentional or unintentional, may encourage prevention and self-management in chronic disease.

Finally, how does the public perceive diabetes-related news messages and, in turn, how can diabetes-related news messages enhance individual ability and motivation to enact adaptive behavior change? A combination of message content analyses, like the present study, and experimentally tested messages may provide the best comprehensive understanding of the potential influence health messages may have on attitudes, intentions, and behaviors related to health outcomes. An experimental study guided by the EPPM and investigating individual perceived threat and efficacy in messages on diabetes self-management would complement the present analysis.

Ultimately, the urgent objective for health communication researchers is to better understand the mechanism through which health-related news messages may influence the complexity of health outcomes in chronic diseases as well as devise a way in which health professionals, health care providers, and those who train journalists can more
effectively provide messages to patients and the public that positively affect prevention in chronic disease. The present study represents a first step toward accomplishing this objective.

In conclusion, this content analysis provides the first known comprehensive overview of how news media portray the self-management behaviors for type 2 diabetes mellitus. News coverage contains incomplete and low-volume discussions of efficacy and self-management behaviors related to primary and secondary prevention; self-management terminology is virtually non-existent. In chronic diseases related to type 2 diabetes, the present study's findings have the potential to translate to and inform an understanding of self-management and prevention messages in obesity, heart disease, and stroke. Findings reveal a missed opportunity for news coverage to encourage self-management for prevention in type 2 diabetes as well as an unclaimed opportunity to give voice to prevention in the face of this epidemic. Despite an increasing threat to the U.S. public health and economy (Bonow & Gheorghiade, 2004; Boyle et al, 2010; CDC, 2011) self-management for prevention in type 2 diabetes mellitus remains voiceless in news messages.
Table 1

*Summary of Reliabilities for Coding*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Krippendorff’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease Definition</td>
<td>.95</td>
</tr>
<tr>
<td>Susceptibility</td>
<td>.88</td>
</tr>
<tr>
<td>Severity</td>
<td>.98</td>
</tr>
<tr>
<td>Response Efficacy</td>
<td>.92</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>.84</td>
</tr>
<tr>
<td>Self-Management</td>
<td>.89</td>
</tr>
</tbody>
</table>
Table 2

*Percentage of Type 2 Diabetes Stories Referencing Susceptibility Factors*

<table>
<thead>
<tr>
<th>Susceptibility Factors</th>
<th>Percentage of Stories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Factors</strong></td>
<td></td>
</tr>
<tr>
<td>Age &lt; 20</td>
<td>19%</td>
</tr>
<tr>
<td>Age 20+ Adult</td>
<td>38%</td>
</tr>
<tr>
<td>Age 65+ Older</td>
<td>26%</td>
</tr>
<tr>
<td>Obesity</td>
<td>56%</td>
</tr>
<tr>
<td>Family History</td>
<td>26%</td>
</tr>
<tr>
<td>Prior Gestational Diabetes</td>
<td>12%</td>
</tr>
<tr>
<td>Glucose Intolerance</td>
<td>74%</td>
</tr>
<tr>
<td>Physical Inactivity</td>
<td>24%</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td></td>
</tr>
<tr>
<td>Specific Symptoms</td>
<td>16%</td>
</tr>
<tr>
<td>Experience No Symptoms</td>
<td>6%</td>
</tr>
<tr>
<td>Severity Factors</td>
<td>Percentage of Stories</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td><strong>Magnitude of Diabetes</strong></td>
<td></td>
</tr>
<tr>
<td>Epidemic</td>
<td>12%</td>
</tr>
<tr>
<td>Increasing Number of Diabetes Cases</td>
<td>45%</td>
</tr>
<tr>
<td>Economic/Individual Costs</td>
<td>20%</td>
</tr>
<tr>
<td>No Cure</td>
<td>8%</td>
</tr>
<tr>
<td><strong>Complications of Diabetes</strong></td>
<td></td>
</tr>
<tr>
<td>Heat Disease and/or Stroke</td>
<td>52%</td>
</tr>
<tr>
<td>Blindness</td>
<td>29%</td>
</tr>
<tr>
<td>Kidney Disease</td>
<td>34%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>23%</td>
</tr>
<tr>
<td>Nervous System Disease/Damage</td>
<td>17%</td>
</tr>
<tr>
<td>Non-Traumatic Lower Limb Amputations</td>
<td>20%</td>
</tr>
<tr>
<td>Death</td>
<td>6%</td>
</tr>
</tbody>
</table>
Table 4

*Percentage of Type 2 Diabetes Stories Referencing Self-Management Factors*

<table>
<thead>
<tr>
<th>Self-Management Factors</th>
<th>Percentage of Stories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Management Terminology</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Primary Prevention</strong></td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td>57%</td>
</tr>
<tr>
<td>Weight Loss</td>
<td>43%</td>
</tr>
<tr>
<td>Nutrition</td>
<td>63%</td>
</tr>
<tr>
<td><strong>Secondary Prevention</strong></td>
<td></td>
</tr>
<tr>
<td>Glucose Control</td>
<td>74%</td>
</tr>
<tr>
<td>Monitor Blood Pressure</td>
<td>17%</td>
</tr>
<tr>
<td>Monitoring Cholesterol Levels</td>
<td>17%</td>
</tr>
<tr>
<td>Preventive Care Practices (e.g. eye, foot, kidney)</td>
<td>10%</td>
</tr>
<tr>
<td>Psychological and Emotional Management</td>
<td>11%</td>
</tr>
<tr>
<td>Communicating with a Physician</td>
<td>21%</td>
</tr>
</tbody>
</table>
Appendix A

Final General Coding Instructions and Rules

April 1, 2011

The instructions and rules below apply to coding for news articles on type 2 diabetes and self-management.

1. Review the codebook each time you start a new coding session. If you are coding more than 10 articles in one sitting, stop and review the codebook periodically, then continue coding. Reference the codebook if at any time you are uncertain of a code or have a question.

2. Each article will be read, coded, and recorded in the data file.

3. Read each article twice. The first time read the entire article for general understanding, then read a second time for coding purposes.

4. When you are ready to begin coding, follow the codebook in order beginning with code number one. Use the corresponding Excel file for data entry. Each code can be answered with a “1” for YES and a “0” for NO, unless stated otherwise in the codebook (e.g., story number, year, etc.).

5. Confirm in the codebook if the code requires an explicit statement. The listed statement must appear in the story as it does in the codebook.

6. Discussions and management of gestational diabetes is similar to type 2 diabetes and should be coded using the same rules for type 2 diabetes.

7. Double-check that the code entered correlates with the variable listed, especially if the same code appears in a sequence of 3 or more. [It is easy to miss or incorrectly enter one cell and that will shift the entire data file.]

8. Go back and re-read the article any time you have a question about the presence of a code.
Appendix B

Final Diabetes Self-Management Codebook

Overview:

The majority of codes can be answers in a straight forward YES or NO format.

1 = “Yes”  
0 = “No”

*Any use of the term “diabetes” (without a type 1 or type 2) should be considered as Type 2 diabetes; code accordingly.

Background:

1. **Story number:**
   This is the number assigned to the article and is located at the top of the file in the article. (e.g., article 7 of 666 DOCUMENTS)

2. **Date Year:**
   In the following format: YYYY (2009, 2010, 2011)

3. **Date Month:**
   In the following format: MM (1=January, 2=February,…12=December)

4. **Source:**
   Specify the outlet of the source (e.g., CNN? NY Times?)

<table>
<thead>
<tr>
<th>Source</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles Times</td>
<td>1</td>
</tr>
<tr>
<td>New York Times</td>
<td>2</td>
</tr>
<tr>
<td>USA Today</td>
<td>3</td>
</tr>
<tr>
<td>Washington Post</td>
<td>4</td>
</tr>
<tr>
<td>CNN.com</td>
<td>5</td>
</tr>
<tr>
<td>Foxnews.com</td>
<td>6</td>
</tr>
<tr>
<td>MSNBC.com</td>
<td>7</td>
</tr>
</tbody>
</table>
Definitions:
Articles will be coded as to whether or not they define type 2 diabetes accurately.

5. Def1 Glucose Above Normal: Only code “yes” if the article references type 2 diabetes as a disease in which *blood glucose levels are abnormal*. Include:
- Any reference to High and/or Low blood sugar; and
- Any reference that type 2 diabetes is related to blood glucose/sugar level.
- If “yes”, See #14; this will often be “yes” as well.

6. Def 2 Type 1 or Type 2: Only code “yes” if the article *clearly explains the difference* between *type 1* diabetes and *type 2* diabetes.
- Type 1 diabetes is usually diagnosed in children and young adults, and was previously known as juvenile diabetes. In type 1 diabetes, the body does not produce insulin.
- In type 2 diabetes, either the body does not produce enough insulin or the cells ignore the insulin.

Example:
- “People are born with type 1 diabetes and the body does not produce insulin. Type 2 diabetes is brought on through lifestyle factors such as obesity and the body cannot process insulin.”

7. Def 3 Most Common: Only code “yes” if the article cites type 2 diabetes as *the most common form of the disease*. Statistics for this are not necessary for a “yes”, but may be coded that way. For example, the following is suggestive of most common:
- 95% of diabetes cases are type 2.

Example:
- “Type 2 diabetes is more common than type 1 diabetes.”

Susceptibility:
Articles will be coded for references to those who are at risk for developing type 2 diabetes. Articles may include references to *one, all, or none* of the following:

8. Age < 20: Any reference to the age of those who are at risk for type 2 diabetes as being less than 20 years old. This includes: adolescents, juveniles, children, etc.

9. Age 20+ Adult: Any reference to the age of those who are at risk for type 2 diabetes as being adults, ages 20-65.

10. Age 65+: Any reference to the age of those who are at risk for type 2 diabetes as being 65 years old or older, elderly, etc.
- Aging populations, older generations, etc.

11. Obesity: reference to those who are at risk for type 2 diabetes as being obese, overweight, having a weight problem, etc.
- Suggest weight control, high BMI, people who need to watch/manage their weight.

12. **Family History**: Any reference to those who are at risk for type 2 diabetes as having a family history of the disease or family members who have been diagnosed.

13. **Prior History of Gestational Diabetes**: Any reference to those who are at risk for type 2 diabetes as previously having gestational diabetes OR those currently have gestational diabetes as having future risk of type 2 diabetes.

14. **Glucose Intolerance**: Any reference to those who are at risk for type 2 diabetes as having an intolerance to glucose (sugar) OR high blood sugar. **See #5**, if yes, this will often be yes. Include references to:
   - **Pre-diabetes**
   - Having to control glucose/blood sugar.
   - Taking insulin/checking blood sugar levels would suggest that someone has a glucose intolerance.
   - *The term intolerance will not always be stated/used, it may be suggested. For example, "The heavier we are, the tougher it is for our body…it has to make more insulin to keep the blood sugar under control."

15. **Physical Inactivity**: Any reference to those who are at risk for type 2 diabetes as having a sedentary lifestyle with low physical activity AND/OR lack of exercise.

16. **Race/Ethnicity**: Reference to those who are at risk for type 2 diabetes as belonging to a minority group. This may include any or all references to: African Americans, Latinos, Native Americans, and Asian Americans, Native Hawaiians and other Pacific Islanders.

**Symptoms**

17. **Specific Symptoms**: Did the article mention any specific symptoms of diabetes?
   - Code explicitly if the story used the word “symptoms”, not each individual symptom.
   - Some symptoms of diabetes include: frequent urination, unusual thirst, extreme hunger, unusual weight loss, cuts/bruises that are slow to heal, tingling/numbness in the hands/feet, recurring skin, gum, or bladder infections.

18. **Experience No Symptoms**: Does the article reference the potential for people who have diabetes to experience no symptoms?
   **Examples:**
   - “Often there are no symptoms.”
   - “Unnoticed due to a lack of symptoms.”
19. **No Mention of Any Symptoms:** Does the article make no mention of any diabetes symptoms at all?
   - See #17, if #17 is yes, this is NO

### Severity:

20. **Epidemic:** Did the article explicitly refer to diabetes as an *epidemic*?

21. **Increasing Cases of Diabetes:** Did the article mention that diagnosed and/or undiagnosed cases of type 2 diabetes are increasing?
   - Include any reference to the current number of diabetes cases in the U.S.
   - Examples:
     - “23.6 million people in the U.S. are diagnosed with diabetes, another 6 million are unaware of their disease, 79 million people have pre-diabetes.”
     - “Pre-diabetes cases are on the rise”, “widespread”, “an explosion of cases”.

22. **Costs:** Did the article make any reference to the financial costs of type 2 diabetes?
   - Include:
     - National or individual costs, insurance costs, impact on economy, etc.

23. **No Cure:** Does the article make any reference to *no cure for diabetes* existing?

24. **Heart Disease/Stroke:** Does the article mention heart disease AND/OR stroke as being related to or as a complication of diabetes?
   - Include:
     - Heart disease and stroke often occur along with diabetes.
     - Cardiovascular health, cardiovascular damage.

25. **Blindness:** Does the article mention blindness or blurred vision as being related to or as a complication of diabetes?
   - Include:
     - Eye damage, blurred vision

26. **Kidney Disease:** Does the article mention kidney disease as being related to or as a complication of diabetes?

27. **Hypertension (high BP):** Does the article mention *hypertension or high blood pressure* as being related to or as a complication of diabetes?

28. **Nervous system:** Does the article mention any nervous system complications or damage as being related to diabetes?
29. **Amputations**: Does the article mention *limb amputations or injury* as being related to or as a complication of diabetes? Include:
   - Loss of a limb (e.g. foot, leg)
   - “Orthopedic injury as a result of foot complications”

30. **Death**: Does the article mention death/deaths as being as a complication or result of diabetes?

**Response Efficacy**

31. **Prevented/Delayed**: Does the article state that type 2 diabetes and disease complications can be prevented AND/OR delayed through recommended self-management behaviors?
   Examples:
   - “Many of the complications from diabetes can be prevented or lessened”
   - “Lower the odds/risk of diabetes through diet and exercise”
   - “A solution to this is weight loss and monitoring blood glucose levels”

32. **Treated through self management**: Does the article state that type 2 diabetes can be treated AND/OR managed through self-management behaviors or lifestyle change behaviors?
   - Treated, controlled, managed, etc.
   Examples:
   - “This approach is effective at treating diabetes.”
   - “Eating right and exercise can help manage this disease.”
   - “This disease can be largely treated through exercise, weight loss, and medication.”

**Self-Efficacy**

33. **Self-Efficacy SM**: Does the article make any reference/statement to individual abilities to gain the knowledge and problem-solving and coping skills to perform recommended behaviors on his or her own to successfully self-manage diabetes?
   Include:
   - Statements that encourage individuals to believe they can carry out the recommended actions.
   Examples:
   - “An individual can manage this disease and improve their quality of life.”
   - Any “you” statements such as: “by checking your blood sugar every day, you can avoid complications.”
   - “In a diabetes education class Williams attended with others who'd been recently diagnosed, she says, the instructor said you have to do three things to control diabetes: Take your medications. Plan and monitor what you eat. Exercise every day.”
Self-Management

34. **Self-Management/Care**: Does the article explicitly use the term *self-management* AND/OR *self-care*?

35. **Exercise**: Does the article reference exercise as recommended behavior for diabetes self-management?

36. **Weight Loss**: Does the article reference *weight loss* as recommended behavior for diabetes self-management? Include:
   - Losing weight, dieting for weight loss, achieving a healthy weight.
   - Weight management/control, increasing exercise to reduce weight or BMI.

37. **Nutrition**: Does the article reference *managing nutrition/diet* as recommended behavior for diabetes self-management?

38. **Glucose Control**: Does the article reference *glucose control* as recommended behavior for diabetes self-management? Includes:
   - Paying attention to blood sugar, checking A1C levels.
   - Injecting insulin to manage glucose levels.
   - Testing/checking blood sugar regularly.

39. **Monitor BP**: Does the article reference *monitoring blood pressure* as recommended behavior for diabetes self-management?

40. **Monitor Cholesterol**: Does the article reference *monitoring cholesterol levels* as recommended behavior for diabetes self-management?

41. **Preventive Care Practices**: Does the article reference any preventive care practices as recommended behaviors for diabetes self-management? Include:
   - Checking feet, eyes, kidneys.
   - Doing physical self checks of your body.
   - Eye examinations, foot examinations.
   - Getting vaccines (flu shot to ward off sickness and extra complications).

42. **Psycho/Emotion**: Does the article reference *managing the psychological and emotional aspects* of a chronic disease as recommended behavior for diabetes self-management?

43. **Comm Physician**: Does the article reference *communicating with a physician* as recommended behavior for diabetes self-management?

Examples:
   - “Talk to your doctor before beginning a diabetes management plan.”
   - “Consult a physician.”
   - “Schedule regular doctor visits.”
References


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