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# Resilience and Coping in the Adolescent and Young Adult with Type 1 Diabetes

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Dissertation Committee

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Submitted in partial fulfillment of the requirements for the degree

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# DEDICATION

I would like to dedicate this work to my family; to my husband Craig, who first inspired me and pushed me to pursue my PhD, and to my four daughters, Dana, Laura, Kaitlyn, and Aly, who I am so proud. You all inspire me every day to be a better wife, mother, and person. Thank you for your love and support which has made this journey possible. “Everything is possible for him who believes” (Mark 9: 23).

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# ABSTRACT

There is a need to understand the roles coping strategies play in enhancing resilience in adolescents and young adults with type 1 diabetes between the ages of 18-30. The purpose of this study was to examine the relationships between and among positive, protective coping strategies (courageous coping), negative coping strategies (defensive coping), and resilience. The Resilience in Illness Model (Haase, Kinter, Monahan, & Robb, 2014) was the theoretical model which guided this research.

A convenience sample was recruited via diabetes organizations' Facebook and Forum pages, a College Diabetes Network chapter meeting, and Juvenile Diabetes Research Foundations' (JDRF) sponsored events. Data were collected both online via SurveyMonkey™ and in paper form at sponsored events. The survey consisted of the demographic information form, the Jalowiec Coping Scale, and the Resilience Scale.

Participants consisted largely of white (91%), educated (91%) females (79%). Females scored significantly higher than their male counterparts in the use of courageous coping strategies ($F$ (1, 64) = 11.98, $p$ = .001). There were no significant differences found between each of the age categories (18-19, 20-24, 25-30) on courageous coping, defensive coping, and resilience scale scores. A multiple regression analysis was conducted to examine whether resilience was predicted from a linear combination of the five coping subscales. Correlations between each of the coping subscales and resilience showed the subscales confrontive (.52), optimistic

(.39), and supportant (.25) to be significantly positively correlated ($p < .05$). The evasive subscale (-.31) was significantly negatively correlated with resilience ($p < .05$). A multiple regression analysis for two unordered sets of predictors (courageous coping and defensive coping) to predict resilience was performed. Both regression equations were significant ($p < .05$). Partial correlational analysis showed, that both courageous coping and defensive coping act to modify the effects of the other in the promotion of resilience.

Coping strategies play a significant role in enhancing resilience in AYA with type 1 diabetes. This study supports past research identifying active coping or problem focused coping, as coping strategies, which are associated with positive adaptive outcomes such as enhanced resilience.

**Key Words**: resilience, theory, process, diabetes, adolescents, young adults, coping, stress.

# Chapter I

# INTRODUCTION TO THE PROBLEM

## Diabetes

The Centers for Disease Control, (2014), reports that 29.1 million, or 9.3% of the United States population, have diabetes. Of the 29.1 million individuals with diabetes, the CDC estimates 8.1 million are undiagnosed. Diabetes is the leading cause of kidney failure, non-traumatic lower limb amputations, and new cases of blindness. It is the major cause of heart disease and stroke, and the seventh leading cause of death (National Diabetes Information ClearingHouse [NDIC], 2011). Diabetics are at greater risk for developing psychological responses such as anxiety and depression often associated with chronic illness (Whittemore, Jaser, Guo, & Grey, 2010).

Researchers have identified diabetes as one of the most common metabolic disorders of childhood with new cases of diagnosed diabetes increasing worldwide among children and adolescents (Perfect & Jaramillo, 2012; Whitemore et al., 2010; Wodrich, Hasan, & Parent, 2011). SEARCH for Diabetes in Youth, a multicenter CDC and NIH study, reports that during 2008-2009, an estimated 18,436 individuals, less than 20 years old are newly diagnosed with type 1 diabetes annually (CDC, 2014). NDIC reports that 215,000 young people under the age of 20 years are newly diagnosed (incidence) or have a diagnosis of (prevalence) of type 1 or type 2 diabetes (2010).

Long term complications in children and adolescents include retinopathy, nephropathy, neuropathy, and macro vascular disease (Donaghue, Chiarelli, Trotta, Allgrove, & Dahl-Jorgensen, 2009; Perfect & Jaramillo, 2012). Complications from these outcomes, include visual impairment or blindness, kidney failure, hypertension, pain, paresthesia, muscle weakness, autonomic dysfunction, cardiac disease, peripheral vascular disease, and stroke (Donaghue et al., 2009). Vascular complications in adolescents and children should be rare, yet early structural and functional abnormalities are evident only a few years after onset (Donaghue et al., 2009).

Glucose dysregulation threatens cognitive development (Naguib, Kulins-Kaya, Lomax, & Garralda, 2009; Perfect & Jaramillo, 2012). Impairment in cognitive and intellectual functioning has adverse consequences for academic achievement and illness management. Cognitive functioning is crucial to the management of insulin pumps, multiple daily injections, carbohydrate counting, blood glucose self-monitoring, and the management of hypo-and hyperglycemic episodes (Nathan et al., 2009). The child or adolescent who is unable to maintain adequate glucose regulation, may experience not only the threat of cognitive disabilities, but also the inability to self-manage her/his illness. This reciprocal relationship further complicates and intensifies his/her diabetes (Naguib et al. 2009).

Peyrot, Rubin, Lauritzen, Snoek, Matthews, and Skovlund, (2005) found negative attitudes, coping difficulties, and psychological problems, such as depression, anxiety, and eating disorders, were common in diabetics. Adolescents

with diabetes face psychosocial challenges such as an increase in anxiety, depression, poor coping and problem-solving skills, and family conflict (Weissberg-Benchell and Antisdel-Lomaglio, 2011). These challenges can lead to diabetes-specific emotional distress, including concerns about weight, medical complications, management of their illness, oversight by family and friends, and the feeling that friends and family do not understand how difficult it is to live with diabetes (Weissberg-Benchell & Antisdel-Lomaglio, 2011).

Herzer and Hood (2010) reported that adolescents with type 1 diabetes are at increased risk for psychological problems such as anxiety. The researchers found that anxiety symptoms were associated with less frequent blood glucose monitoring and suboptimal glycemic control. Hood, Huestis, Maher, Butler, Volkening, and Laffel (2006) found that adolescents with diabetes have nearly twice the incidence of depression than adolescents without diabetes in the 16 to 18 year age group studied. One in seven adolescents met the criteria for clinical depression. Factors associated with depression included diabetes-specific variables such as suboptimal adherence to management, less frequent blood glucose monitoring, and poorer glycemic control. Females were more likely to have elevated depression scores than males. Diabetes-specific conflict between the adolescent and parent was also associated with increased problems of emotional functioning in the diabetic adolescent (Hood et al., 2006).

Diabetes is a severe chronic illness. A diagnosis is considered a critical life event. Intensive self-management is a significant stressor for the adolescent and young adult (AYA) with type 1 diabetes. Intensive self-management also adds

significant stress to family and peer relationships (Seiffge-Krenke & Stemmler, 2003). Resilience is the process of developing strengths and resources to manage significant stressors resulting in an enhancement in the quality and wellbeing of one's life (Haase, 2004). Studying resilience models such as the Resilience in Illness Model (Haase, Kintner, Monahan, & Robb, 2014), has the potential to lead to a new understanding of how to develop new strengths and resources to manage the daily challenges facing AYA with type 1 diabetes.

**Resilience**

Resilience is a dynamic process resulting in positive adaptation in the context of significant adversity (Gillespie, Chabayer, & Wallis, 2007). Development of resilience is dependent on the shared interactions between the individual, the environment, and life experiences (Gillespie et al., 2007). Adaptation is the process of adjusting to one's environment. Effective adaptation is compatible with life where as poor adaptation threatens life (Fawcett, 2000; Levine, 1996). Ahern (2006) explains resilience as a continuum of adaptation or success with its roots in coping and stress research. The process of positive adaptation is the essence of resilience. Definitions vary according to the setting, sample, researcher, and variables being studied (Ahern, 2006).

Haase (2004) identifies resilience as a positive health concept often defined by other health concepts such as coping. The study of resilience initially focused on identifying the resilience factors that predict positive outcomes, and is now moving toward understanding the process of developing resilience, the interaction of these

factors, and how they result in successful coping (Bradshaw, Richardson, & Klara, 2007).

The Resilience in Illness Model (Haase, Kinter, Monahan, & Robb, 2014) is an example of a resilience model developed and exclusively studied within the context of adolescents and young adults (AYA) with cancer. It is a comprehensive approach to the process and outcomes of resilience in AYA and is an appropriate model to apply to AYA with other chronic conditions such as diabetes (Nelson, Haase, Kupst, Clarke-Steffen, Brace-O'Neill, 2004). This model depicts multiple interactive pathways which act to enhance resilience. Courageous (protective) coping and defensive coping (risk) are two variables identified in this model which play a role in the enhancement of resilience.

Resilience, is an interactive process of adaptation that fluctuates over time as part of an individual's development (Rutter, 1985). The capacity of the individual to incorporate his or her personal characteristics, family and social support, and community resources as he or she moves through life experiences is dependent on developmental transitions (Ahern, 2006; Gillespie et al., 2007). Resilience, studied in times of transition accompanied by stress, is developmentally specific (Tusaie & Dryer, 2004). Adolescence for example, is a period of vulnerability, rapid development, and often stressful experiences (Ahern, Ark, & Byers, 2008).

**Adolescent/Young adult (AYA)**

Research on adolescent development, according to Graber and Brooks-Gunn (1996) often focuses on the transitions which define the adolescent experience. In

their review of caring for adolescents on pediatric hospital wards, Heaton, Routley, and Paul (2013) noted that, the range of ages included in the definition of adolescence varies among researchers, often not define at all. Historically, the period of adolescence refers to the transition from childhood to adulthood (Graber & Brooks-Gunn, 1996). This period of transition, affected by one's culture, defines one's roles and expectations of behavior. Often thought of as a singular period of transition, new theories have emerged identifying transitional events that define entry into and exit from adolescence (Arnett, 2000; Arnett, 2010; Graber & Brooks-Gunn, 1996).

Adolescence begins earlier and lasts longer in industrialized countries (Arnett, 2010). If the end of adolescence is measured in terms of role development (marriage, parenthood, stable full-time work), adolescence may end much later than originally theorized and for many may last into the mid-twenties (Arnett, 2010). Whereas earlier entry into adolescence may be the result of biological changes such as menarche, later exit from adolescence may be the result of social change (Arnett, 2000). Social changes which might explain this late exit include extended education, delaying marriage and children to the mid to late twenties, and a time of frequent change in relationships, work, and world view (Arnett, 2000).

Developmental milestones characterize transitional periods. They are also periods requiring new modes of adaptation to biology, psychology, and social change (Graber & Brooks-Gunn, 1996). Arnett (2000) theorizes that there is a distinct transitional period between childhood and adulthood in industrialized societies which is neither adolescence nor young adulthood. Arnett defines this transitional period as

emerging adulthood. This period extends from late teens through the twenties (18-25 years old) and is a distinct age group demographically, subjectively, and in identity exploration. Identity formation may begin in adolescence but, according to Arnett, rarely completed by the end of high school. Identity formation continues to develop through the late teens and twenties. Late teens until the mid-twenties may constitute a new distinct developmental period where identity issues play a predominant role (Schwartz, Côté, and Arnett, 2005). Identity formation among emerging adults may represent an extension of Erikson's (1968) psychosocial moratorium allowing individuals within this transitional period to freely explore potential identity alternatives (Swartz et al., 2005).

Besides cultural and societal influences, there are concrete biological changes in brain development between the ages of 11 and 25 years old (Colver & Longwell, 2013; Winters & Arria, 2011). Brain maturation continues throughout adolescence and into adulthood, confirmed by magnetic resonance imaging (Bennett & Baird, 2006). Cognitive control networks in the prefrontal cortex do not develop fully until the mid-twenties (Willoughby, Good, Adachi, Hamza, & Tavernier, 2013). These networks are responsible for planning, judgment, and inhibition. Neural connections among brain regions continue to strengthen. Changes in brain development results in periods of pruning and rewiring. Predominant neural circuits become more efficient (Colver & Longwell, 2013; Willoughby, Good, Adachi, Hamza, & Tavernier, 2013).

Based on transitional (Meleis, 2010) and developmental theory (Arnett, 2000; Arnett, 2007) and the recognition that emerging adulthood is a distinct developmental

period, Hanna (2012) proposes a framework for youth with type 1 diabetes during the emerging adulthood transition. According to Hanna (2012), emerging adulthood is a critical time for those with diabetes. Glycemic control often worsens around the ages of 18-19, improving around ages 22 to 24. Underlying Hanna's framework is the assumption that diabetes care responsibility is a separate concept from diabetes management, and it is primarily diabetes care responsibility which is the key developmental milestone within this transitional period. It is therefore the goal of the emerging adult to develop autonomy and independence resulting in ownership of his/her diabetes care (Hannah, 2012).

Researchers, according to Smetana, Campione-Barr, and Metzger (2006), typically divide adolescence into three developmental periods; early adolescence (ages 10-13), middle adolescence (ages 14-17), and late adolescence (ages 18 until early 20's). Where biology dictates the beginning of adolescence with the onset of puberty, the end of adolescence is determined more by the culture in which the adolescence is raised (Smetana et al., 2006). Colver and Longwell (2013) believe that what is widely understood as normal adolescence is a social construct. Whether recognized as adolescence, late adolescence, emerging adulthood, or AYA (Haase et al., 2014), individuals between the ages of 18 and 25 are recognized as being in a distinct developmental period between childhood and adulthood. It is important to recognize how individuals navigate developmental transitions in order to understand risk and resilience (Graber & Brooks-Gunn, 1996).

## Coping

Lazarus & Folkman (1984) define coping as constantly changing cognitive and behavioral efforts to manage internal and external demands when they exceed an individual's resources. Coping strategies, conceptualized within the Resilience in Illness Model, act as either protective factors, enhancing one's resilience, or risk factors, affecting resilience in an adverse manner. Haase et al., (2014) have conceptualized protective, positive coping strategies as courageous coping which promotes resilience. Defensive coping, identified as a risk factor, adversely affects resilience, or acts as a protective factor that may enhance resilience when mediated by courageous coping. This study examined the relationships between and among courageous coping, defensive coping, and resilience in the AYA with type 1 diabetes.

**Gender and Coping Strategies.** Researchers have documented the use of different coping strategies or styles by gender. Coping strategies and coping styles are terms often used interchangeably among researchers to identify coping behaviors (Puskar & Grabiak, 2008; Luyckx, Seiffge-Krenke & Hampson, 2010; Luyckx, Vanhalst, Seiffge-Krenke, & Weets, 2010; Snethen, Broome, Kleber, & Warady, 2004; Zimmer-Gembeck & Skinner, 2008). Studying the coping styles of adolescents with end stage renal disease between the ages of 13 to 18 years, Snethen et al. (2004), found significant differences in the use of humor by gender. Males used humor more than females in coping with the stresses of renal disease. Luyckx, Seiffge-Krenke et al. (2010) examined active coping, psychological symptoms, and glycemic control in adolescents with type 1 diabetes between the ages of 12 to 16 years. Girls scored

higher than boys on the use of active coping strategies. Zimmer-Gembeck and Skinner (2008) studied coping behaviors and developmental patterns of adolescents dealing with daily stressors. Girls were found to use more rumination and more support from friends and family while boys use more distraction. Girls also used a greater range of coping strategies than boys.

In adolescents between the ages of 14 to 17 years living in a rural community, Puskar and Grabiak (2008) found adolescent males used approach coping styles (logical analysis, positive reappraisal, seeking guidance and support, and problem solving) more than females. Females used more avoidance behaviors (cognitive avoidance, acceptance and resignation, seeking alternative rewards, and emotional discharge) than males.

Luyckx, Vanhalst, et al. (2010) studied the typology of coping in the emerging adult (individuals between the ages of 18-30 years) with type 1 diabetes. Gender differences were identified with young women using more passive avoidant behavior (state of passivity and avoidance) whereas young men used more active integrated behavior (actively coped with challenges and problems, and acceptance of illness as part of self). Since different coping strategies used by males and females have been identified in adolescents and young adults between the ages of 18-30 years, gender differences were examined in the use of courageous coping, defensive coping, and the relationships these strategies had on resilience in this study.

Studies on coping strategies and resilience in adolescents and young adults with type 1 diabetes within a resilience model are limited in number. There is a need

to understand how AYA cope with the stressors of diabetes in order to promote resilience. The significance of understanding resilience in nursing lies in its implications for prevention and intervention of risk and disease states (Rutter, 1990). Nurses need to understand the process of resilience to help patients progress to and maintain wellness (Polk, 1997).

## Problem Statement

There is a lack of understanding of the roles protective (courageous) coping strategies and negative (defensive) coping strategies play in enhancing resilience in adolescents and young adults with type 1 diabetes in order to help this population navigate through the acute and chronic stressors of their illness.

## Purpose

The Purpose of this study was to examine the relationships between and among courageous coping strategies (positive, protective coping strategies), defensive coping strategies (negative coping strategies), and resilience in adolescents and young adults with type 1 diabetes.

## Definitions

**Resilience:** Resilience is conceptually defined as a positive health concept: a process of identifying or developing resources and strengths leading to expanded growth and enhancement of the quality of life (Haase et al., 1999). Resilience is operationally defined as the score obtained on the Resilience Scale (Wagnild, 2009).

**Coping:** Coping is conceptually defined as constant changing cognitive and behavioral efforts to manage specific external and /or internal demands (Lazarus & Folkman, 1984).

**Courageous Coping:** Courageous coping is defined as the degree to which an adolescent/young adult used positive confrontive, optimistic, and supportive coping strategies to deal with type 1 diabetes. Courageous coping is operationally defined as the cumulative score of the Jalowiec confrontive, optimistic, and supportant subscales (Haase et al., 2014).

**Defensive Coping:** Defensive coping is defined as the degree to which the adolescent/young adult used evasive and emotive coping strategies to deal with the diabetes experience. Defensive coping is operationally defined as the cumulative score obtained on the Jalowiec evasive and emotive coping subscales (Haase, 2004; Haase et al., 2014).

**Adolescence/Young Adulthood:** Adolescent/young adulthood is defined as a transitional period between childhood and adulthood and is recognized as a distinct stage of development (Arnett, 2000; Arnett, 2010; Graber & Brooks-Gunn, 1996). AYA is operationally defined as individuals between the ages of 18-30 years old.

**Type 1 diabetes:** Type 1 diabetes is defined as a chronic condition where the pancreas produces no insulin requiring the administration of insulin via multiple daily injections or insulin pump to maintain normal blood glucose levels. Type 1 diabetes is operationally determined through self-report of having type 1 diabetes.

## Delimitations, Inclusion/Exclusion Criteria

Inclusion criteria for this study consisted of older adolescents and young adults between the ages of 18 and 30 years, diagnosed with type 1 diabetes. The duration of illness from time of diagnosis was a minimum of one year. All participants had to be able to read and understand English at a 6th grade level.

## Theoretical Framework

The Resilience in Illness Model (RIM) was the framework for this study. The RIM was developed by Haase and colleagues (Haase, Heiney, Ruccione, & Stutzer, 1999; Haase et al., 2014) using methodological triangulation to examine resilience in adolescents with chronic illnesses, including cancer. The researchers used both qualitative and quantitative studies simultaneously and sequentially to develop first the Adolescent Resilience Model (Haase et al., 1999) and the more recently revised model, the Resilience in Illness Model (Haase et al., 2014).

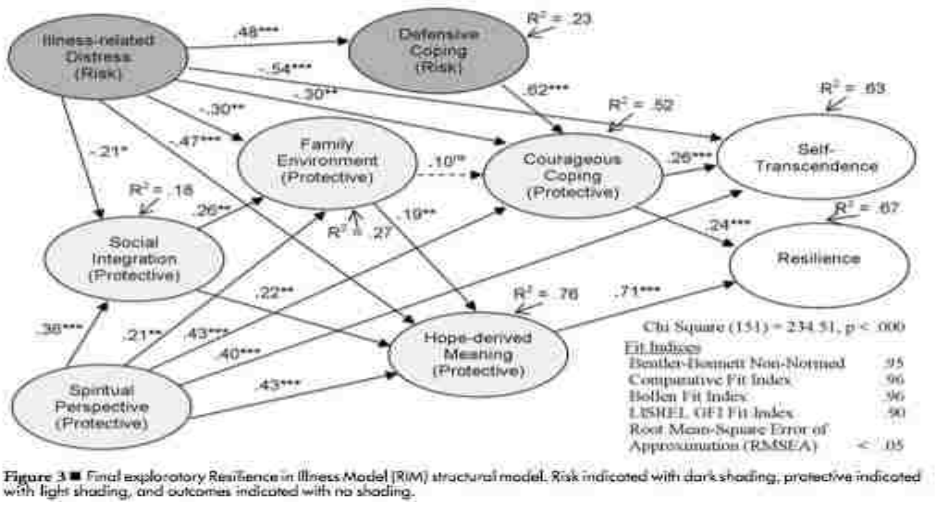


Figure 3 ■ Final exploratory Resilience in Illness Model (RIM) structural model. Risk indicated with dark shading, protective indicated with light shading, and outcomes indicated with no shading.

Figure 1. Haase, J., Kintner, E., Monahan, P., Robb, S. (2014). The resilience in illness model, part I: Exploratory evaluation in adolescents and young adults with cancer. Cancer Nursing, 37, E1-E12. http://www.ovidsp.tx.com.ezproxy.shu.edu. Copyright 2014 Wolters Kluwer Health/Lippincott Williams & Wilkings. Reprinted with permission.

The Resilience in Illness Model includes specific factors which either enhance resilience (protective factors) or minimize resilience (risk factors) in adolescents and young adults. Factors identified as protective include family environment (the degree to which the AYA perceives the family as adaptable, cohesive, able to communicate effectively, and possessing family strengths), social integration (the degree to which the AYA perceives a sense of connectedness with and support from friends, and healthcare providers while experiencing chronic illness), hope derived meaning (the degree to which the AYA has an expectation that a future goal or outcome is possible), spiritual perspective (the degree to which the AYA has a belief in or a connectedness with a greater power than self), and courageous coping. Factors identified as a risk include illness-related distress (the degree of illness related

uncertainty and disease symptom-related distress perceived by the AYA), and defensive coping. The model depicts resilience and self-transcendence (the degree to which the AYA uses inward introspective activities and expresses outwardly concerns for the welfare of others) as outcomes of all the interactive pathways between the protective and risk factors (Haase, 2004; Haase et al. 2014).

Haase et al. (2014) constructed the Resilience in Illness Model (RIM) to help guide the development of interventions within the population of adolescents and young adults with chronic illness, especially cancer. The researchers identified adolescents with cancer as a neglected population in respect to psychosocial services. With limited theory based research on interventions to help adolescents adjust positively to their cancer experience, Haase and fellow researchers (Haase et al., 1999) focused on the concepts of positive health such as resilience to develop a theoretical model to guide interventions.

Haase et al. (1999) defined positive health, within the realm of chronic illness, as a process of identifying or developing resources and strengths to manage stressors to gain positive outcomes. Haase (2004) recognizes resilience as a positive, complex, multidimensional concept. The RIM is a comprehensive approach to the process and outcome of resilience in adolescents and young adults with cancer and other chronic illnesses. This model has been developed to depict multiple influencing factors of resilience (illness-related distress, social integration, family environment, defensive coping, courageous coping, derived meaning) or to define components of specific

concepts (i.e., courageous coping, defensive coping and resilience) (Haase, 2004; Haase et al., 2014).

Adolescents and young adults with type 1 diabetes are at risk for developing psychosocial problems as well as acute and long-term complications related to their illness. Since individuals differ in goals, coping strategies, and experiences (Kupst, 2004), understanding how AYA with diabetes adapt positively to their significant adversity or stress is particularly important, not only to help mitigate complications, but also to help identify and develop strengths to manage these stressors and enhance positive growth (Nelson et al., 2004).

The Resilience in Illness Model was the theoretical model guiding this research. The strength of this model was in its ability to posit relationships between/among specific variables such as courageous coping, defensive coping, and resilience. It was the intent of this study to examine (a) the relationships between and among the concepts of courageous/positive coping (i.e., confrontive, optimistic, and supportant strategies), defensive coping (evasive and emotive strategies), and the outcome resilience, and b) the relationships between differing coping strategies and their effects on resilience in adolescents/young adults with type 1 diabetes. As a comprehensive approach to the process and outcome of resilience in adolescents/young adults with cancer, RIM was an appropriate model to apply to adolescents with diabetes (Haase et al., 2014; Nelson et al., 2004).

**Research Question**

What are the relationships between and among courageous coping strategies (confrontive, optimistic, and supportant), defensive coping strategies (emotive and evasive), and resilience in adolescent/young adults (AYA) with type 1 diabetes?

Sub questions:

1. What is the relationship between the use of courageous coping strategies (positive) and resilience in the adolescent/young adult with type 1 diabetes?
2. What is the relationship between the use of defensive coping strategies and resilience in the adolescent/young adult with type 1 diabetes?
3. What is the relationship between gender and resilience?

**Significance**

Diabetes is one of the most prevalent metabolic disorders of childhood, increasing in frequency among children and adolescents worldwide (Whittemore, Jaser, Guo, & Grey, 2010). According to the CDC (2014), 29 million adults and children in the U.S. have diabetes. As the population with diagnosed diabetes increases, so does the financial burden. According to Herman (2013), the cost of diabetes is rising faster than overall medical costs with one in five health care dollars in the U.S. now going to care for individuals diagnosed with diabetes. Total costs (direct medical costs and indirect costs such as lost productivity) have risen from $174 billion in 2007 to $245 billion in 2012.

Diabetes care is complex and involves addressing issues beyond glycemic control (ADA, 2009). Adolescents and young adults with diabetes must cope with

acute and long term medical complications, intensive management of the illness, and the many psychosocial challenges associated with living with a chronic illness. Health-related quality of life issues and psychological morbidity remain less than optimal (Cameron, Northam, Ambler, & Danemn, 2007). Adaptive ways of coping with diabetes related health issues have significant influences on positive outcomes (Seiffge-Krenke & Stemmler, 2003).

This study promotes a greater understanding of the resilience process, and the role that coping strategies may play in improving the outcomes for AYA with chronic conditions such as diabetes. Fostering resilience could contribute to reduced risks and improved outcomes in this population (Bradshaw et al., 2007). A better understanding of the resilience process in AYA with diabetes, may assist in the development of interventions promoting resilience and improve quality of life (Tusaie, Puskar, & Sereika, 2007).

# Chapter II

## REVIEW OF THE LITERATURE

This chapter provides the theoretical rationale for this study and an overview of what is known about the relationships among and between courageous coping, defensive coping, and resilience in adolescents/young adults (AYA) diagnosed with type 1 diabetes with a minimum duration of one year. The Resilience in Illness Model provided the framework for understanding the relationships among and between the above variables in this study. This review of the literature examines the phenomenon of resilience. It examines the historical development, the theoretical models and frameworks, empirical studies, and the nursing literature on resilience for adolescents and young adults (AYA) with type 1 diabetes. Additionally, this analysis of the literature illuminates what is known about each of the variables, their relationships with one another, and identifies important gaps in the literature.

Data base searches were performed using the Cumulative Index of Nursing and Allied Health (CINAHL), Nursing and Allied Health Source (ProQuest) and EBSCOhost Electric Journal Services (EJS) to find theoretical and empirical articles related to resilience. Keys words most often used to search the data bases included: resilience, theory, models, frameworks, process, adolescents, young adults, interventions, nursing theory, and diabetes. Scholarly articles and empirical studies related to resilience, theories relating to the process of resilience, diabetes,

adolescents, and young adults, were chosen for review. This resulted in approximately 45 articles retained for review.

**Resilience**

The concept of resilience is dynamic and complex. Researchers have applied the concept to high risk populations such as in the children whose parents have mental illness, (Garmezy, 1985; Rutter, 1985, 1987, 1990) and children at risk for psychopathology and developmental problems (Masten, 2001). It is a construct which has changed over time, evolving from categorization of characteristics which make one invulnerable to adversity, to a developmental process model addressing interactions among an individual, his or her environment, and personal experiences (Garmezy, 1985; Gillespie, Chaboyer & Wallis 2007; Masten, 2001).

Garmezy (1991) defined resilience as the capacity to recover and maintain adaptive behaviors after insult. Masten, Best, and Garmezy (1990) defined resilience as the process of, capacity for, or the outcome of successful adaptation despite challenging or threatening circumstances. In examining adolescent resilience, Ahern (2006) defined resilience as the process of adaptation to risk that incorporates personal characteristics, family and social support, and community resources. Wagnild and Young (1993) in an early study, define resilience as a personality trait that moderates the effects of stress promoting adaptation. While many researchers have defined resilience, Wagnild (2009) describes the common threads that link these definitions to include adaptation, balance, competence, determination, optimism, and

acceptance. Wagnild defines resilience as both a process and a personality trait (Wagnild, 2009).

The study of resilience evolved from research done in high risk populations in temperament and in developmental psychology (Rutter, 1990). By studying children who performed better than expected in the face of adverse conditions, researchers hoped to explore links to psychopathology and to develop new treatments (Masten, 2001).

Studying women with psychopathology (schizophrenia, affect disorder, personality disorder), Garmezy, Masten, and Tellegen (1984) observed that the children of these women, although at an increased risk for mental disorders themselves, exhibited very few symptoms. For more than 10 years, Garmezy and fellow researchers studied competence and incompetence in these high risk children. The researchers hypothesized that competence might serve as a protective factor against the expression of behavior disorders (Garmezy et al., 1984). They defined competence in areas of academic achievement, classroom behavior, and interpersonal relationships (Garmezy et al., 1984). Results showed that a majority of these vulnerable children exhibited successful patterns of social behavior and work achievement (Garmezy et al., 1984).

From the work on children of mothers with mental illness, the concept of "stress resistant" children began to emerge (Garmezy et al., 1984, p. 98). Stress resistance was defined as manifestations of competence in children despite exposure to stressful events. Stress factors and personal attributes combined were seen to predict

competence (Garmezy et al., 1984). To identify stress resistant children, research was directed toward understanding the protective factors which would correlate with adaptive behaviors (Garmezy, 1985). Protective factors included personal features such as self-esteem, family cohesion, and the availability of external support systems. For example, protective factors associated with children of poverty included temperament, reflectiveness in new situations, cognitive skills, and the presence of a caring adult (Garmezy, 1991, 1995). Psychiatric literature at that earlier time was describing resilience as three distinct phenomena: good outcomes, sustained competence under threat, and recovery from trauma (Masten et al, 1990).

The study of adversity furthered the development of the conceptual definition of resilience. The study of adversity was categorized into three phases. Phase I focused on adverse experiences resulting in psychiatric disorders. Phase II focused on different types of life experiences, and Phase III focused on the universal observation that despite severe stressors and adverse situations it was unusual for more than half of the children studied to succumb to their adverse conditions (Rutter, 1985).

Empirical studies related resilience to individual variation in response to risk. Some individuals succumbed to stress and adversity while others overcame it. Contending with difficult situations at one moment did not mean an individual would be able to do so with stressors from different situations at different times. Changing circumstances over time alters resilience (Rutter, 1987).

Genetic differences such as gender, temperament, and intelligence explained individual difference in response to stress and adversity prior to the conceptualization

of resilience (Rutter, 1985). Due to psychological and physiological mechanisms, Rutter believed that it was very unlikely that genetic factors alone would be responsible for these differences. He believed that there is an interaction between the individual's risk and protective factors. Protective factors could overwhelm the individual's risk factors resulting in successful adaptation. This interaction between risk and protective factors could explain the differences in response to stress and adversity. Rutter believed that it was not the quantity of risks versus protective factors which resulted in successful adaptation but the interaction of these factors explained through an understanding of protective factors and an interactive process.

Rutter (1990) therefore defined resilience as a bipolar concept with vulnerability at one end and protective factors at the other: "the positive pole of the ubiquitous phenomenon of individual differences in people's response to stress and adversity" (Rutter, 1990, p. 181). Before discussing Rutter's idea of this continuum between vulnerability and protection, one must first understand the role of protective factors. Rutter (1985) described these factors as modifiers or mediators which ameliorate or alter an individual's response to an environmental insult that predisposes one to poor outcomes. They are not necessarily positive experiences but they may have a "toughening effect" on the individual leading to a positive adaptive outcome (Rutter, 1985). According to Rutter, they may not be an experience at all but rather a personal quality or characteristic. Protective factors may have no detectable effect without the presence of these stressors (Rutter, 1985).

The vulnerability/protective mechanism modifies response to risk by either intensifying (vulnerability) or ameliorating (protection) the reaction that would lead to a maladaptive behavior (Rutter, 1987). If one was to examine the role of self-esteem, high self-esteem would fall on the positive pole of the vulnerability/protective scale acting as a positive asset and low self-esteem would fall on the negative end intensifying one's risk for poor outcomes. Resilience is an interactive process (Rutter, 1990). It is the interaction of multiple variables (falling at different points on the vulnerability protection scale) interacting with adverse conditions resulting in better than expected outcomes. A protective factor for one individual might be vulnerability for another. This interactive process occurs over time within the constraints of one's developmental state (Rutter, 1985).

**Resilience as a developmental process.** Vulnerability and resistance to stressful experiences will change based on human development across the life span. Developmental researchers define resilience based on fulfilling major expectations of a given society or culture for the behavior of a specific age and situation (Masten et al., 1990). Adolescence for example, is a period of vulnerability and rapid development (Ahern, et al., 2008). Older children and adolescents experience stronger and longer lasting reactions to situations than very young children. According to Ahern et al., (citing Erikson, 1968) risk is an essential tool in the formation of an adolescent's identity. Adolescents engage in risky behavior often with the belief that they are invulnerable to danger (Ahern et al., 2008). Under stressful situations, adolescent boys demonstrate more disruptive or aggressive

behaviors than girls, and girls have more anxiety and depression. Resilience and the developmental process are interactive (Ahern et al., 2008). Gaps remain in our understanding of how this interactive process works. Resilience appears now to be a common phenomenon that results from basic human adaptation. If adaptive systems are working, development is strong even in the face of adversity (Masten, 2001). If these adaptive systems fail, the reverse is true and the risk of developmental problems increases.

Today, resilience and positive coping in the face of adversity appear to be taking center stage in the study of positive psychology, a subspecialty of psychology (Hart and Sasso, 2011). Wong (2011) identifies four major concepts within positive psychology: meaning, virtue, wellbeing, and resilience. Haase (2004) identifies resilience as a positive health concept: the process of developing resources and strengths to manage stress resulting in positive outcomes. Haase recognizes resilience as a complex, multidimensional concept often defined by other positive health concepts such as a sense of mastery, confidence, and self-esteem. Bradshaw et al., (2007) describes resilience as a process of successful coping through the use of protective factors and developmental assets. Wagnild (2009) believes that everyone has the capacity to respond to adversity with resilience, the ability to rebound from life's challenges and grow in a positive fashion from these experiences.

According to the National Research Council Committee on Future Directions for Behavior and Social Research (2001), there is a need for the National Institutes of Health to invest resources in advancing the knowledge of positive health concepts.

Concepts such as resilience, move away from health models which focus on illness and disease and focus on positive protective behaviors which enhance optimal health and wellbeing.

From a historical prospective and review of the literature, the phenomenon of resilience has shifted from the interest in identifying the factors which are attributed to the differences in individuals achieving better than expected outcomes in the face of adversity, to identifying and understanding the adaptive and interactive processes of resilience. The focus today is on expanding the understanding of resilience as a positive health concept used to identify and promote resources and strengths to aid the individual's adaptation to significant life challenges.

**Models and Theoretical Frameworks of Resilience.** With the intent to better understand the interactive processes of resilience, models and theoretical frameworks associated with the interactive process of resilience were further examined. Models and frameworks from the disciplines of psychology, social work, and nursing were examined.

Sandler, Wochik, and Ayers (2008) used a contextual resilience framework to examine adaptation post bereavement. The authors proposed that the concept of resilience best explained the desired outcomes of this adaptive process. In this model three major concepts were discussed; adversity, adaptation processes, and resilience trajectories. Sandler et al. defined adversity as the threat to the well-being and developmental competencies of the individual. In this model it was parental death which was the defined adversity. Risk and protective factors affect resilience

outcomes through common pathways (Sandler et al., 2008). Through their own research of bereaved children, Sandler et al. identified three self-system processes: the sense of connection to one's primary caregiver, the sense of control or efficacy, and the sense of self-worth. Adversity threatens these self-systems. It is supportive or protective factors which lessen these negative effects through a compensatory response (Sandler et al., 2008). An example of a protective factor in this case may be a caring relative who is capable of meeting the emotional needs of the bereaved child. Over time adaptation occurs where the individual finds new ways to satisfy his or her basic needs (Sandler et al., 2008). Positive or negative adaptation as reflected in resilience outcomes, occurs across multiple domains of functioning (Sandler et al., 2008). Examples of negative domains include mental health problems, substance use, and physical health problems. Positive domains include life satisfaction, growth and developmentally competent role performance (Sandler et al., 2008).

In this model, adversity (e.g., parental death) interacts with the adaptation processes which in turn results in resilience trajectories. Within the adaptation process, environmental processes (families, communities and cultures) and individual processes (i.e., self-efficacy and self-worth) interact with needs satisfaction and developmentally competent role performance (Sandler et al., 2008). Environmental processes also interact with individual processes. How adversity interacts with these adaptive processes will determine whether the resilient trajectory will be adaptive or maladaptive. For example, using this model, a young child faced with the loss of a mother will adapt based on the ability of other family members to satisfy the needs of

that child in a meaningful way. Individual processes such as cognitive development will determine whether there is meaning to that loss. Another positive relationship which meets the needs of a very young child, will more than likely progress toward wellbeing and developmental competencies with minimal problems. In older children where the loss is associated with greater meaning, different factors (age, gender and coping patterns) will affect the adaptive process resulting in different outcomes based on the context of the situation.

Within the resilience literature, the definitions of resilience vary based on the context being studied (Ahern, 2006). According to Harney (2007), from an ecological perspective, the expressions of resilience used should vary depending upon the person-process contexts. Harney examined Bronfenbrenner's (1979) Person-Process Context Model of Human Development to understand resilience from this ecological perspective. Citing Bronfenbrenner (1979), Harney describes the ecological perspective as one that involves the interrelationships of individuals and the contexts in which they live. These interrelationships are reciprocal and interactive processes between macro and micro level contexts (Harney, 2007). Micro level contexts might include mother child relationships and family environments. Macro level context might include social and cultural factors (Harney, 2007). To understand resilience from an ecological perspective, one must therefore understand the influence of community, culture, and subculture on the psychological and interpersonal processes of that individual throughout their life span (Harney, 2007). Within a specific context, particular variables are more likely than others to lead to resilience.

Therefore specific processes may lead to resilience in some contexts but not in others (Harney, 2007).

Within the context of social work, Keenan (2010) uses Dynamic Systems Theory (DST) to understand "stress and coping" and "trauma and resilience". Keenan describes DST as a theory belonging to a family of theories derived from developmental biology and math (chaos theory). Focusing on human beings, DST addresses variations from within and between individuals (Keenan, 2010). It requires an understanding of multiple pathways to understand how one responds to nonlinear change. DST is a means to describe complex patterns and pathways to understand adaptation and coping (Keenan, 2010).

According to Keenan (2010), DST focuses on two main principles; human beings as self-organizing systems and human beings as being acutely sensitive to their environments. As self-organizing systems, individuals move through time and space, formed and reformed by adaptive process and feedback, becoming more complex and ordered over time (Keenan, 2010). Keenan discusses how individuals, composed of numerous systems (digestive systems, central nervous systems, cardiovascular systems) and subsystems (memory, affect, beliefs, and perceptions) communicate and cooperate with each other. Wellbeing is a balance between these multiple systems to maintain harmony and balance (Keenan, 2010). In DST, internal and external processes guide self-organization over time (Keenan, 2010). Internal processes specific to stress and coping, resilience and trauma include bio-psycho-social capacities (self-efficacy, temperament, constitutional factors, proactive initiative,

sense of mastery and preparedness), also referred to as personal resources or protective factors (Keenan, 2010). Keenan describes external forces as variables in the environment which influence self-organization. An example of these external forces may be a loss or lack of material resources such as adequate income, safe and stable housing, and accessibility to health care.

Examining the second principle of DST, which deals with the individual's sensitivity to the environment, Keenan (2010) discusses how instability occurs. A large amount of information exposed to an individual has the capacity to overwhelm existing systems. How one responds to these stressors depends on past life experiences, current conditions of self-organization systems, and the risk and protective factors which help make the person who they are at any given moment (Keenan, 2010).

Polk (1997) looked to develop a middle range theory of resilience in nursing. Looking at adversity as an opportunity for growth and development, and recognizing the fact that nursing is involved with individuals who are moving through or in the process of overcoming adversity, nurses needed a resilience theory to understand the mechanism of this phenomenon to promote health and wellbeing. By understanding resilience, nurses could provide resources, nurture inherent strengths, and look to develop new interventions.

Confused by the multiple attributes and themes associated with resilience, Polk (1997) reviewed 26 articles defining resilience attributes looking for patterns or themes. Polk identified four patterns: dispositional, relational, situational, and

philosophical. Disposition patterns (patterns of physical, and ego related psych-social attributes) included attributes such as competence, sense of self-esteem, genetics, intelligence, health, temperament, and self-efficacy to name a few (Polk, 1997). Relational patterns included roles and relationships, both intrinsic and extrinsic. Intrinsic relational patterns were concerned with commitment to relationships and personal intimacy whereas extrinsic patterns described social interest, education, jobs and social activities (Polk, 1997). Polk placed cognitive appraisal skills, problem-solving, flexibility, and resourcefulness under the theme of situational patterns. Self-knowledge, hope, and purpose fit with philosophical patterns.

Pattern recognition provided the necessary data needed to understand individual human energy fields (Polk, 1997). Polk speculates that human energy maintains itself through the continuous energy flow of building up and breaking down. Citing Rogers (1990), Polk discussed how both human and environmental energy fields move toward increasing diversity, with the trend toward increased order or negentropy. Individuals and the environment are distinct yet continuous intermingling fields of energy (Polk, 1997). It is Polk's belief that the concepts of patterns achieve increased order. As human energy ebbs and flows intermingling with the energy of the environment, the individual moves through temporary chaos to new levels of functioning and organization (Polk, 1997). Polk sees adversity as the catalyst for change. As the individual develops dispositional, relational, situational and philosophical patterns of resilience, transformation occurs (Polk, 1997).

Resilience is the synergistic relationships of these four patterns as a unitary pattern (Polk, 1997).

**Resilience in Illness Model (RIM)**. The Resilience in Illness Model (Haase et al., 2014) is a resilience model developed over a 27 year period to understand the positive health processes and outcomes in adolescents and young adults (AYA) with chronic illness, particularly cancer. This model, developed as a theory driven model, is a comprehensive, integrative representation of the process and outcome of resilience. The aim of the model is to ameliorate negative outcomes for AYA with cancer by focusing on positive health concepts such as positive coping (Haase, 2004; Haase et al., 2014). Haase and fellow researchers developed this model with the intentions that it would lead to interventions which would help those with chronic illnesses such as cancer strengthen their resilience when faced with the stressors associated with a chronic illness (Haase, 2004; Haase et al., 1999).

The RIM is a theoretical model based on two philosophical perspectives (a) life span development and (b) meaning based models. Life span development examines change either across developmental phases (childhood through adulthood) or within one developmental group such as adolescence (Haase, 2004). Other factors such as life experiences, historical events, and contemporary issues contribute to one's life span development (Haase et al., 2014). Meaning-based models identify meanings, patterns, and experience of illness based on the adolescent and family perceptions (Haase, 2004; Haase et al., 1999; Haase et al., 2014).

The RIM consists of two factors identified as risk factors (illness-related distress and defensive coping), five factors identified as protective factors (family environment, courageous coping, social integration, spiritual perspective, and hope-derived meaning), and two factors identified as outcome factors (resilience and self-transcendence). The RIM, developed through a mixed method research approach, used both qualitative and quantitative research methods. Studies done both sequentially and simultaneously, either generated the model, or developed and tested the psychometric properties of the instruments used to measure the factors in the RIM (Haase et al., 1999, Haase et al., 2014).

There is an increasing emphasis in resilience research to move away from identifying predictive factors (such as self-efficacy, hope, social resources, parenting) that are associated with positive adaptation, resulting in better than expected outcomes, in the face of adverse conditions. Instead, the research in resilience is moving toward an understanding of the process or mechanism of adaptation (Sandler et al., 2008; Windle, 2011). A variety of disciplines developed theoretical models and frameworks in an effort to understand the interactive process of resilience. Existing resilience models attempt to explain how individuals interact with their environment developing positive adaptive patterns of behavior within the context of their own experiences and development (Haase et al., 2014; Harney, 2007; Keenan, 2010; Polk, 1997; Sandler et al., 2008). Within the resilience literature, the definitions of resilience vary depending on the context being studied (Ahern, 2006).

The Resilience in Illness Model is a resilience model developed by nurses (Haase et al., 2014) to understand how adolescents and young adults interact with their environment within the context of chronic illness. The Resilience in Illness model looks to identify resilience as both a process and an outcome variable. With little consensus on the operational definitions of resilience (Gillespie et al., 2007), further research is needed to test and apply theories such as the RIM to understand the process and to further refine the operational definition of resilience.

***Development of the Resilience in Illness Model.*** Developmental studies included phenomenology (Haase, 1987; Haase, Doner, Heiney, Ruccione, Kuperberg & Stutzer, 1994; Haase & Rostad, 1994; Leidy & Haase, 1996), simultaneous concept analysis (Haase, Britt, Coward, Leidy, & Penn, 1992), and model evaluation studies (Haase, Berry, & Stutzer, 1991). The Resilience in Illness Model is the result of previous revisions of first the Becoming Courageous Model (Haase et al., 1999) followed by the Adolescent Resilience Model.

The Becoming Courageous Model, the first precursor of the RIM, evolved from the phenomenological study (Haase 1987) of adolescents between the ages of 11 and 21 years old with chronic illnesses such as cancer, cystic fibrosis, scoliosis, and asthma (Haase et al., 1999). Themes included concepts such as courage through coping, supportive relationships, and spirituality, all which helped the adolescent move to the resolution of a particular situation. The researchers characterized a sense of resolution as mastery, confidence, and accomplishment to maintain or improve a situation (Haase et al., 1999). Simultaneous concept analysis (SCA) further

generated the model (Haase et al., 1992; Haase et al. 1999). Its purpose was to increase the power of the theoretical models, explain variance, and define concepts (Haase et al., 1999). The results of the simultaneous concept analysis according to Haase et al. (1999) were a series of matrices comparing antecedents, critical attributes, and outcomes across concepts. Matrices comparing coping, self-transcendence, and spirituality helped to identify redundancy (Haase et al., 1999). According to the researchers, simultaneous concept analysis also helped with the interpretation in the instrument phase, to identify the sources of theoretical overlap and assist with analysis decisions when several instruments loaded on more than one factor.

Hasse et al. (1999) used the inductively derived meanings from the phenomenological studies and existing theory to develop labels and definitions for each factor in the model. This resulted in a theoretical model consisting of six latent variables: awareness, ways of coping, relationships with others, spirituality, being courageous, and quality of life. After defining the variables, Haase et al. (1999) developed a latent variable measure model as used by Bentler (1989). The latent variable model analysis required at least two instruments to measure each latent variable (the phenomenon or construct that the scale intended to reflect). The researchers had to first develop new instruments for each major category derived from the first two phenomenological studies. Each new instrument was then examined for congruence with existing instruments. Criteria for congruency included

the consistency with the qualitative data, adequate psychometric properties, and the clinical appropriateness (Haase, 1999).

After the Becoming Courageous Model and the instruments were developed or identified, additional studies measured and evaluated the full model (Haase et al., 1999). A multi-site study done in the United States and Canada with a convenience sample of 73 non- hospitalized adolescents (11-21 years) with cancer, cystic fibrosis, and asthma (Haase et al., 1991; Haase et al., 1999; Haase et al., 1994) provided support for the predicted factor structure and provided further evidence of construct validity (Haase et al., 1999). The Becoming Courageous Model was then further analyzed using exploratory analysis of measurement models (Haase et al., 1999), which led to further conceptualization of the latent variables. The best-fitting structural model showed the following relationships: Relationship Derived Meaning was affected positively by Uncertainty in Illness (beta= 0.42); Courageous Coping was affected positively by both Defensive Coping (beta= 0.41) and by Relationship Derived Meaning (beta = 0.49); and Quality of Life was effected negatively by Defensive Coping (beta= -0.40) but affected positively by Relationship Derived Meaning (beta= 0.70) (Haase et al., 1999).

Now identified as The Adolescent Resilience Model (ARM) this refined model consisted of five factors and one outcome factor. Three of the five factors (individual, family, and social protective) were hypothesized to affect resilience positively and were called protective factors (Haase et al., 1999). The researchers further broke these factors down into individual protective factors, family protective

factors, and social protective factors. Individual protective factors included courageous coping and derived meaning, family protective factors included family atmosphere and family support/resources, and social protective factors included health care resources and social integration (Haase et al., 1999). Two factors were hypothesized to be risk factors (individual risk and illness-related risk) negatively affecting the development of resilience. The individual risk factor consisted of defensive coping, and the illness-related risk factor consisted of illness perspective and symptom distress/severity of illness (Haase et al., 1999). The outcome variable originally identified as *quality of life* in the Becoming Courageous Model was relabeled *resilience* in the ARM. Resilience included confidence or mastery, self-transcendence, and self-esteem (Haase, 2004; Haase et al., 1999).

The ARM was further evaluated for its psychometric properties. A study of 103 adolescents and young adults with cancer (11 and 24 years) was conducted at four sites in the United States and Canada for the purpose of conducting exploratory measurement and structural equation model testing of ARM. A best-fitting measurement model was used to test the goodness-of -fit of the hypothesized full latent variable model (Haase et al., 1999). According to the researchers, the goodness-of-fit index for most of the exploratory models was > 0.96. Although additional factors important to resilience were addressed in revising the Becoming Courageous Model to the ARM, parameters were shown to be unstable and Haase et al. (1999) concluded that further research was needed.

In revising and renaming the Adolescent Resilience Model (Haase 2004) to the Resilience in Illness Model, Haase et al. (2014) used exploratory latent variable structural equation modeling with a combined sample taken from two studies of preadolescents, adolescents, and young adults. It was necessary to combine studies to provide an adequate sample to test the full model. The researchers identified these two studies as RIM 1 and RIM 2. RIM 1 used data obtained in 1999 from a convenience sample of non-hospitalized English speaking adolescents and young adults between the ages of 10 to 26 years old. The sample was drawn from major medical centers in Oklahoma, South Carolina, and Vancouver, British Columbia. Time since cancer diagnosis ranged from 1 to 18years. RIM 2, completed in 2004, used a convenience sample of both hospitalized and non-hospitalized adolescents and young adults (10-26 years old) newly diagnosed with cancer and connected to large medical centers in Arizona, California, and Indiana. Similar to RIM 1, all participants were English speaking. Participants with cognitive debilities were excluded (Haase et al., 2014).

Both study participants completed a booklet of RIM instruments (Haase, 1987; Haase et al., 1999) originally used in the development of ARM. The instruments included the Illness-Related Distress Measure (Risk Factor), the Family Environment Measure (Protective Factor), Defensive Coping (Risk factor) and Courageous Coping (Protective Factor) measured by the subscales of the Jalowiec Coping Scales-Revised, Social Integration (Protective Factor), Derived Meaning (Protective Factor), and two

outcome instruments measuring resilience and self-transcendence (Haase et al., 2014).

The Haase Resilience in Illness Scale (Haase et al. 2014) was developed to measure resilience based on Haase's (1987) previous qualitative work done on courage and the thematic development of resolution (characterized by a sense of mastery, competence, accomplishment, feeling of growth, and the desire to improve and maintain a given situation). The measures of self-esteem and confidence as indicators of resilience were not included in this new model. Haase et al. (2014) found that in the revision of ARM, self-esteem was highly correlated with multiple indicators and cross-loaded onto multiple factors. General measures of confidence according to the researchers competed with the context-specific Resilience in Illness Scale for variance and thus confidence measures as indicators of resilience were also excluded from the final exploratory measurement model.

Haase et al., (2014) analyzed the data from RIM 1 and 2 in three phases: demographic and psychometric analysis, development of the measurement model, and test of the structural model. The combined sample ($N$ = 202) included participants ranging in age from 10 to 26 years old ($M$ =15.83, $SD$= 2.70). Preliminary analysis according to the researchers showed no differences among the model variables in regards to sex, race, current age, or household income. Internal consistency reliability of all scales and subscales were deemed to be adequate (Cronbach's α coefficient > .70). Confirmatory factor analysis was used to estimate the goodness of fit of indicators (factors) in the measurement model. Haase et al. found that each indicator

loaded significantly on its correct construct ($p$ <.0001). The Bentler-Bonett Non-Normed Index (NNFI) and Comparative Fit Index (CFI) measurement of 0.95 and the Bollen Fit index measurement of 0.96 further supported the goodness of fit of the measurement model (Hasse et al., 2014). Structural equation model testing showed only a marginally good fit of the path model ($X^2_{142} = 233.09$ [$n$= 189], $p$ <.001). Although the model fit well with the data, the $X^2$ test could be statistically rejected. As the result of Wald and Lagrange tests, Haase et al. dropped five pathways and using theory as a guide, added an additional five pathways. The Bentler-Bonett NNFI (0.95) and the CFI and Bollen Fit Index (both at 0.96), measures of the structural model, according to the researchers, indicated that the model achieved a reasonable approximation to the data. All pathways in the model except the pathway from family functioning to courageous coping were significant ($p$ < .05).

The final RIM structural model now consisted of two risk variables (illness - related distress and defensive coping), five protective variables (family environment, courageous coping, social integration, spiritual perspective, and hope derived meaning), and two outcome variables (self-transcendence and resilience). Confirmatory evaluation of RIM revealed courageous coping and derived meaning explained 52% and 76% respectively of the variance in the outcome variables self-transcendence and resilience. The researchers believe that this finding supports RIM as a valid model to explain the process of resilience with the potential to identify interventions to enhance resilience in chronic illness (Haase et al. 2014).

As a result of the pathway changes in the RIM, the definition of resilience as developed by Haase et al. (1999) needed to be changed to reflect the difference between resilience as a process and resilience resolution as an outcome (Haase et al., 2014). Self-esteem and confidence/mastery measures as initial indicators of resilience no longer fit well as indicators of resilience in RIM. Both concepts were seen as global measures and not sensitive enough to measure context specific self-esteem and confidence/mastery used in the resolution of the chronic illness experience (Haase et al., 2014). The latent outcome variable of resilience was now separated into two different variables (resilience and self-transcendence) each playing different outcome roles. Resilience was operationalized through the Resilience in Illness Scale developed to reflect a sense of mastery, competence, accomplishment, and a feeling of growth leading to motivation to continue or improve a given situation (Haase et al., 2014). The researchers developed RIM to either design interventions focused on specific protective factors or risk factors that enhance resilience, or to focus on specific concepts in the model that foster improved quality of life.

Haase and her colleagues further identified coping strategies as either a risk factor or a protective factor. Within the RIM, the latent variable Courageous Coping defined the protective coping strategies and was operationalized using the subscales confrontive, optimistic, and supportant of the Jalowiec Coping Scale-Revised (Jalowiec et al., 1994; Jalowiec, 1988). Likewise, the latent variable Defensive Coping defined defensive coping operationalized using the emotive and evasive subscales.

**Measurements of Resilience.** Haase, et al. (2014) developed a new instrument (Resilience in Illness Scale) to measure resilience as an outcome variable in the RIM. However, the researchers have not yet completed the psychometric testing on this new instrument. Ahern, Kiehl, Sole, and Byers (2006) identified six instruments measuring resilience or a construct of resilience. The instruments identified included the Baruth Protective Factors Inventory (Baruth & Carroll, 2002), the Connor-Davidson Resilience Scale (Connor & Davidson, 2003), the Resilience Scale for Adults (Friborg, Barlang, Martinussen, Rosenvinge & Hjemdal (2005), the Adolescent Resilience Scale (Oshio, Kaneko, Nagamine & Nakaya, 2003), the Brief-Resilience Coping Scale (Sinclair & Wallston, 2004), and the Resilience Scale (Wagnild & Young, 1993). Populations studied included primarily undergraduate students (Bruth & Carroll, 2002; Oshio et al., 2003), and adults (Connor & Davidson, 2003; Friborg et al., 2003; Sinclair & Wilson, 2004; Wagnild & Young, 1993). Internal consistency as measured by the Cronbach's Alpha ranged from .69 for the Brief-Resilient Coping Scale to .89 in the Connor-Davidson Resilience Scale. There existed adequate internal consistency among all factors in the Adolescent Resilience Scale ($r$ =.72 to .75). The reliability coefficient alpha of the Resilience Scale was .91 (Ahern et al., 2006). Ahern et al. determined that of the six instruments studied, the Resilience Scale (Wagnild & Young, 1993) was the best instrument to use to measure resilience in the adolescent population due to its psychometric properties and application in a wide range of age groups including adolescents (Black & Ford-Gilboe, 2004; Hunter & Chandler, 1999; Neill & Dias, 2001).

Wagnild and Young (1993) published the Resilience Scale for the purpose of measuring Resilience directly (Wagnild, 2011). Wagnild (2011) reports consistent reliability of the Resilience Scale with alpha coefficients ranging from 0.84 to 0.94. A random sample of 810 community-dwelling older adults was used to standardize the tool. The sample consisted of adults ranging between 53 and 95 years of age, with the majority of the participants being female (62%), married (61%), educated beyond high school (66.2%), and in good health (Wagnild & Young, 1993). Developed inductively from two qualitative studies and literature review (Wagnild &Young, 1990; Wagnild & Young, 1993) five characteristics of resilience were identified reflecting the theoretical definition of resilience (Wagnild, 2011). Wagnild (2011) identified these characteristics to be self-reliance, purposeful life, equanimity, perseverance, and existential aloneness. Exploratory principle factor analysis showed a two-factor solution of the Resilience Scale factors; 17 items (0.41-0.75) in factor I (Personal Competence) and 8 items (0.45-0.49) in factor II (Acceptance of Self and Life) (Wagnild & Young, 1993; Wagnild, 2011). It is the personal competence factor in the Resilience Scale which appears most congruent with the concepts of mastery, competence, and accomplishment in the Haase Resilience in Illness Scale (Haase et al., 2014). Personal competence in the Resilience Scale incorporates items from the self-reliance, meaning, and perseverance subscales (Wagnild, 2009).

**Summary of resilience.** There is a need to move away from pathological health care models that focus on symptoms and management of chronic illness such as type 1 diabetes. Focusing on positive health concepts such as resilience, could lead

to interventions and strategies to promote positive growth and adaptation. Resilience is defined as a complex process, a continuum of adaptation involving the interaction between risk and protective factors (Ahern, 2006; Haase, 2004; Rutter, 1990; Tusaie & Dryer, 2004). Individuals develop resilience through the presence of adversity. Factors, which either protect or minimize one's ability to adapt successfully, moderated and mediated life experiences (Ahern, 2006; Masten et al., 1990; Wagnild, 2011; Wagnild &Young, 1993). The study of resilience has moved away from identifying factors associated with positive outcomes (Garmezy, 1985; Garmezy, 1991; Garmezy et al., 1984; Rutter, 1985; Rutter, 1987). Current research has identified resilience as a normal developmental positive health model, focused on positive protective behaviors that enhance optimal health and wellbeing (Haase, 2004; Hart and Sasso, 2011; Masten, 2001; Masten et al., 1990; Rutter, 1990).

There are limited theories examining resilience as a process whereby the individual is in continuous interaction between self and environment. The Resilience in Illness Model (Haase, 2004; Haase et al., 1999; Haase et al., 2014) is a theory driven model: a comprehensive, integrative representation of the process and outcome of resilience in AYA. The RIM is a nursing theory exclusively studied in AYA with cancer. Models such as RIM, applied to populations outside those with cancer, will help researchers to continue to add new knowledge to the understanding of the process of becoming resilient. The RIM identifies relationships between and among variables (illness related illness, defensive coping, courageous coping, social

integration, spiritual perspective, family, and hope) which may influence resilience outcomes (Haase et al., 2014).

Revisions to the Haase Resilience in Illness Scale, an instrument developed to measure resilience in RIM, have not been completed (Haase, 2014). Few researchers have designed instruments to specifically measure resilience, instead using multiple indicators and instruments. For this reason, the Resilience Scale (RS) was used to measure resilience in this study (Wagnild, 2009). This scale has been used extensively across multiple populations including adolescents and young adults with diabetes. The Resilience Scale has two factors that reflect the theoretical definition of resilience (Wagnild, 2009). The personal competence factor in RS appears congruent with the concepts of mastery, competence, and accomplishment identified in the Haase Resilience in Illness Scale.

**Coping**

Coping strategies, identified within the Resilience in Illness Model, have a major impact on Resilience. For this reason, it was also the purpose of this review of the literature to examine the concept of coping. Coping as it relates to adolescents and young adults, coping and chronic illness, specifically type 1 diabetes, and empirical studies examining the relationships between coping, resilience, and AYA with type 1 diabetes, are discussed. Data base searches were performed using the Cumulative Index of Nursing and Allied Health (CINAHL), Nursing and Allied Health Source (ProQuest) and EBSCOhost Electric Journal Services (EJS) to find theoretical and empirical articles related to coping. Keys words most often used included coping,

stress, resilience, diabetes, adolescents, and young adults. Scholarly articles and empirical studies related to coping theory, coping and chronic illness, coping and diabetes, coping and adolescent development, coping and young adult development were chosen for review. Approximately 35 articles were retained for review.

According to Skinner, Edge, Altman, & Sherwood (2003), understanding how one copes with his or her environment is fundamental to understanding how stress affects the individual. How one copes can increase or reduce the effects of adverse life events. The ability to adapt to stress and adversity is a central focus of human development (Compas, Conner-Smith, Satzman, Thomas & Wadsworth, 2001). Lazarus and Folkman (1984) define coping as constantly changing, cognitive and behavioral efforts to manage specific external and/or internal demands. The individual appraises these demands as either challenging or overwhelming to his or her resources to adapt. Yi-Frazier et al., (2009) describe coping as cognitions and behaviors used to master, tolerate, or reduce these internal and external demands.

Lazarus and Folkman (1984) identify coping as a process, what a person actually thinks or does in relationship to their changing environment. The individual directs these coping thoughts and actions toward a particular condition. In order to understand how the individual copes to a given stress, the researcher must first understand how he or she appraises the stress.

Lazarus and Folkman, define psychological stress as a relationship between a person and the environment that strains his or her resources and effects wellbeing in a negative fashion. In an attempt to understand the stressor, an individual makes

appraisals based on beliefs, such as beliefs in personal control, and existential beliefs such as a belief in God. Lazarus and Folkman define this process of categorizing stressful encounters in regards to their effects on wellbeing as cognitive appraisal. Cognitive appraisals are further identified as either primary or secondary. Primary appraisal determines whether the stressor is perceived as a harm/loss, threat, or a challenge. Secondary appraisals are the actions needed (coping options) to manage the threat or the challenge (Lazarus & Folkman, 1984).

Skinner et al. (2003) describe coping not as a specific observable behavior but as an organizational construct that incorporates a wide range of actions individuals use to deal with stressful situations. Skinner and fellow researchers analyzed 100 assessments of coping over a 20 year period compiling a list of 400 ways of coping. Little consensus could be found about how to conceptualize or measure ways of coping. Researchers viewed ways of coping as a lower order category of coping: countless real time responses in dealing with specific stressors. Lower order categories include problem solving, strategizing, and planning. Lower order categories serve the function of finding groups of actions effective in bringing about a desired outcome (Skinner et al., 2003). Skinner et al. describe higher order categories as basic adaptive processes that mediate between stress and psychological outcomes. The three most common higher order categories used and described in dichotomous terms include: problem focused versus emotion focused, approach versus avoidance, and cognitive versus behavioral coping (Skinner et al., 2003).

As the status of the person-environment relationships change, so does the form of coping (Lazarus & Folkman, 1984). There is a function of continued appraisals and reappraisals. Lazarus and Folkman explain coping functions as a strategy that serves a particular purpose. Two common coping functions are coping strategies that are directed at managing or altering the problem causing the distress (problem focused coping) and coping that is directed at regulating the emotional response to the problem (emotional focused coping). Cognitive processes directed toward mitigating emotional distress might include strategies such avoidance, minimizing the situation, and selective attention (Lazarus & Folkman, 1984). Many of these strategies identified as defensive coping strategies lead to maladaptive behaviors. Problem focused forms of coping are coping strategies used to problem solve. They help define the problem and generate alternative solutions (Lazarus & Folkman, 1984).They are often thought of as positive coping strategies promoting positive adaptation. According to Lazarus and Folkman, both problem focused coping and emotional focus coping can act to facilitate or to impede each other in the coping process; both can also occur concurrently.

Coping is fundamental to understanding how stress affects individuals and it is the ability to adapt to stress and adversity which is central to human development (Compas et al., 2001; Skinner et al., 2003). Viewed as an ongoing dynamic process that changes in response to changing demands or stressful events, how one copes with these demands has the effect of either amplifying or reducing one's response to adverse life events (Compas et al., 2001; Skinner et al., 2003). Researchers identify

coping not as a specific behavior but as an organizational construct that includes a multitude of actions used to deal with stress. The type of stressor and the level of development of the individual play a role in the ways one copes with adversity (Skinner et al., 2003). Little consensus exits about how to either conceptualize or measure the concept of coping, or how to organize ways of coping into higher order categories of coping (Skinner et al., 2003). There is a need to further define coping to reflect a developmental process (Compas et al., 2001).

**Coping and adolescent development.** Adolescents cope differently than adults due to their unique developmental stages such as puberty, central nervous system development, and specific adolescent stressors (Colver et al., 2013; Garcia, 2010; Winter & Aria, 2011). According to Compas et al. (2001), individual development contributes to the resources available for coping and limits the types of coping strategies the adolescent will be able to utilize. Coping, competence, and resilience are all distinct aspects of successful adaptation and development (Compas et al., 2001). Citing the works of Piaget and Erikson, Garcia (2010) discusses the developmental domains of the adolescent. These domains include physical, psychological, social, and spiritual dimensions. The rate of development the adolescent experiences across these domains may vary and do not necessarily parallel one another.

The development of critical thinking and the processing of information occur during adolescence. Older adolescents have the greater capacity to remember and to reason both deductively and inductively (Garicia, 2010). Zimmer-Gembeck and

Skinner (2008) detail three major developmental stages of the adolescent. These stages include the development of self-identity, the development of relationships within groups and outside the family, and the development of emotional and behavioral autonomy. Based on biological, cognitive, and social development such as puberty and brain development, there is a shift in stress reaction (involuntary behavioral impulses) and coping as the individual moves from early childhood to adolescence.

Adolescence is a period of rapid ego development. In a longitudinal study to examine changes in ego development in adolescents emerging into adulthood between the ages of 14 and 24 years old, Syed and Seiffge-Krenke (2013) examined the relationships between identified trajectories of ego development with family context and identity formation. The researchers identified ego development as the means by which an individual obtains mastery of self within social contexts and linked it to growth of personality and identity (Syed & Seiffge-Krenke, 2013). Based on Loveinger's (1976) model of ego development consisting of nine levels through which an individual must pass to a normative developmental pattern, the researchers used descriptive statistics and bivariate correlations to examine ego development, family climate, and identity status. Studying 98 families with a child (14 and 24 years old) over a 10 year period, ego development was measured at four different stages, ages 14, 15, 17, and 24 years of age. Identifying four trajectory pathways using a four class quadratic model, the researchers found that a large number of participants (n=48) spent most of their adolescence in a normative stage which

plateaued at level 5 (level of self-awareness) and that this stage for many represented the apex of their ego development (intercept = 4.02 [.11], $p$ <.001; linear slope = 0.34 [.08], $p$ <.001; quadratic slope − 0.03[.01], $p$ < .01). Syed and Seiffge-Krenke found that stabilization of ego development had more to do with reaching a particular level than age. Two groups, the rapid progression trajectory ($n$ =13, intercept = 4.37 [.18], $p$ <. 001; linear slope = 0.67 [.14], $p$ < .001; quadratic slope = −0.04 [.01], $p$ <.01), and the moderate progress trajectory ($n$ = 32; intercept = 4.62 [.14], $p$ < .01; linear slope=0.23 [.09], $p$ < .01; quadratic slope non-significant) did not follow the stabilization pathway of the normative group, rather surpassing the plateau stage at self-awareness and instead progressing to higher levels of ego development at approximately age 16. Still a small portion of participants ($n$ = 5) fell into the stable low trajectory category, remaining at low levels of ego development throughout the 10 years (intercept= 3.56 [.20], $p$ < .001; neither the linear or quadratic slope were significant). Syed and Seiffge-Krenke concluded that there is heterogeneity in ego development from adolescence to emerging adulthood and that ego development occurs most rapidly during adolescence tapering off in early adulthood.

Adolescents experience an array of stressors. Besides stressors which coincide with normal growth and development (Garcia, 2010) the adolescent faces stressors associated with school, relationships with peers, problems with teachers, academic issues, and interpersonal issues (Zimmer-Gembeck & Skinner, 2008). Transitional periods, such as leaving home, contemplating career and educational pathways, and forming intimate relationships, may further compound common stressors (Zimmer-

Gembeck & Skinner, 2008). Adolescents with chronic illnesses, face even greater challenges. With appearance, body image, sexuality, and emotional vulnerabilities already at the forefront, chronic disease may further exacerbate these already sensitive areas of development (Snethen, Broome, Warady, 2004). Chronic illness stressors according to Snethen et al., result in an increase in mental health problems, social stress and isolation, altered physical appearance, decrease school attendance, and an alteration in physical ability and stamina.

Adolescent coping includes both overt behavioral and covert cognitive responses (Compas et al., 2001). Compas and colleagues explain that both of these responses will vary depending on the stressful context, the adolescent's developmental stage, and their learned styles of responding to these stressors. According to Zimmer-Gembeck and Skinner (2008), coping incorporates emotional regulation strategies, thought processes, and behaviors. Compas et al. (2001) found little consensus regarding the categories or dimensions which identify child and adolescent coping strategies. Contrasting theoretical perspectives related to identifying the basic structure of coping further exacerbated this problem (Compas et al., 2001). There is a wide variety of categories and subtypes of adolescent coping. Problem solving, information seeking, cognitive restructuring, avoidance, and distraction are only a sample of the categories and subtypes cited by Compas et al. (2001).

**Coping and RIM.** In the Resilience in Illness Model, Haase and fellow researchers (Haase, 2004; Haase et al., 1999; Haase et al., 2014) identify coping as

either positive/protective or defensive/risk. Evasive and emotive coping strategies make up defensive coping, a variable identified as an individual risk factor. Associated with poorer outcomes, this cluster of coping strategies over time will have a negative effect on resilience (Haase, 2004). Defensive coping may play a protective role in transitional and threatening situations such as when one encounters new situations. Sustained defensive coping acts to minimize resilience if not replaced by more positive coping strategies (Haase, 2004; Haase et al., 2014).

Positive coping in the Resilience in Illness Model is made up of confrontive, optimistic, and supportant coping strategies (Haase, 2004; Haase et al., 2014; Jalowiec, 2011; Jalowiec, Murphy, & Powers, 1984). Haase found these positive strategies are associated with an increase in resilience.

**Coping and chronic illness.** Researchers have studied coping strategies among adolescents with a variety of chronic illnesses such as diabetes, end stage renal disease, and HIV (Jaser & White, 2010; Orban et al., 2010; Snethen et al., 2004). Coping strategies used by adolescents with end stage renal disease (ESRD) was the focus of Snethen et al's 2004 study. The sample of convenience included adolescents ($n$ = 35) between the ages of 13 to 18 years old diagnosed with ESRD and identified by their health care providers as having the mental, physical, and reading capacity to participate in the study. Sites used to recruit participants included a regional children's hospital clinic and a dialysis/transplant summer camp. The findings of this study were part of a secondary analysis from a larger study to examine adolescents' perceptions of living with end-stage renal disease. Snethen et al. used A-COPE

survey instrument developed by Patterson and McCubbin (1996) to measure coping strategies used by their participants. Analysis of their findings showed that adolescents with ESRD used a variety of coping strategies to manage their chronic illness. Listening to music (54.3%) was reported as one strategy used "most of the time". Strategies identified as being used "sometime" included "try to reason with parents and talk things out" (57.1%), "get angry and yell at people" (48.6 %), and "try to help other people solve their problems" (45.5%) (Snethen et al., 2004). Gender, age, transplant status, and religious views were individual characteristics significantly related to some coping strategies used by these adolescents. Males used more humor than females *(r* = 2.204, *df* = 33, *p* =.021). Age was inversely associated with "venting feelings" (*r* = -.338, *df* = 34, *p* = .047) with older adolescents less likely to avoid problems (*r* = -.349, *df* =34, *p*=.04). Older adolescents tended to use more coping strategies with younger participants using more avoidance behavior (Snethen et al., 2004).

Oban et al. (2010) carried out a study to examine disease specific stressors and coping behavior in youth with HIV. The researchers used two cohorts, long term survivors who acquired HIV from their mothers at birth, and those youth who acquired HIV through sexual or drug use behaviors. The researchers were interested in identifying not only disease specific stressors but also whether the participants used active or passive coping strategies more often. Oban et al. were also interested in whether one form of coping was more beneficial than the other in these two groups.

Participants included adolescents (*N*=166) between the ages of 13-21years old who were seropositive for HIV. Participants enrolled at five different clinics in Washington DC, Baltimore, MD, and New York, NY. The researchers measured coping strategies using Kidscope, an 11 item inventory of common behavioral and cognitive coping strategies (Oban et al., 2010). Each item represents a different coping strategy. The items "I thought about something else; try to forget it; or went and did something like watch TV", operationalized the copying strategy distraction. Other coping strategies included social withdrawal, cognitive restructuring, self-criticism, blaming, problem solving, active and passive emotional regulation, wishful thinking, social support, and resignation (Oban et al., 2010). Oban et al., interested in clustering individual coping strategies into more general coping styles, used factor analysis with varimax rotation. Using Eigenvalues > 1 the researchers ended up with a two factor solution; active and passive coping. The passive coping factor included passive emotional regulation, wishful thinking, withdrawal, cognitive restructuring, self-criticism, and blaming others. Active coping included social support, problem solving, and active emotional regulation.

Oban et al. (2010) found that passive coping was used significantly more often by the youths who acquired HIV infections through high risk behaviors ($F$ (1, 163) =5.72, $p < 0.05$) and older youth ($F$ (1, 163) = 5.5, $p < 0.05$). Adolescents with moderate immune functioning were more likely to use passive coping than healthier adolescents ($p < 0.01$). The researchers also found passive coping associated with greater depression. Oban et al. found that overall adolescents reported passive

emotional-regulation (regulating emotions through relaxation, prayer, taking walks, and talking to self) as the most frequently used and most helpful strategies. Problem solving was used the least but when used was rated as the most helpful of the strategies. The researchers also found that adolescents with more emotional and behavioral problems used fewer coping strategies than their healthier counterparts.

***Coping and diabetes.*** Few studies over the past 10 years have focused on coping and adolescents with type 1 diabetes with a paucity of studies examining the relationships between coping, diabetes, and resilience in this age group. Many of the more recent studies examine coping within the context of glycemic control (Graue, Wentzel-Larsen, Bru, Hanestad, & Sovic, 2004; Luyck, Seiffge-Krenke, & Hampson, 2010). Graue et al. (2004) examined coping styles and the association of coping styles with metabolic control and diabetes quality of life. Studying adolescents ($n$ = 103) between the ages of 13-18 years old with type 1 diabetes (diabetes duration 7.1 ± 3.8 years), the researchers hypothesized that problem-focused copying styles would be positively associated with better metabolic control and perceived diabetes related quality of life where as emotion-focused copying styles would have an inverse effect.

Using a cross-sectional survey, Graue et al. (2004) examined the coping styles; active coping, planning, instrumental support, responsibility taking, emotional support, mental disengagement, behavioral disengagement, aggression, and self-blame. The researchers further identified the coping styles as either problem-focused coping (active coping, planning, instrumental support, and responsibility) or emotion-focused coping. Graue and colleagues concluded that poor metabolic control and

reduced diabetes-related quality of life was significantly related to emotional-focused coping strategies such as behavioral disengagement ($p < 0.01$), mental disengagement ($p < 0.05$), and aggression ($p < 0.01$). Greater use of active coping ($p < 0.05$) was significantly related to greater metabolic control.

Using a longitudinal research design, Luyckx, Seiffge-Krenke et al. (2010) studied active coping and withdrawal, psychological symptoms, and glycemic control in adolescents ($n = 109$) with type 1 diabetes. Adolescents between the ages of 12-16 years old ($M = 13.77$, $SD = 1.41$) were recruited from pediatric health care services in two German Cities. The researchers hypothesized that active coping would be associated with positive glycemic control and withdrawal coping would be associated with greater psychological symptoms and poorer glycemic control. Luyckx et al. also hypothesized that the relationships between the coping behaviors and glycemic control were reciprocal in nature; glycemic control was not only influenced by coping behaviors but also could influence coping behaviors.

Measuring active coping and withdrawal coping over a four year span, the researchers concluded that coping styles did change with active coping increasing over time. As withdrawal coping styles (identified by the authors as a less adaptive coping style) decreased, psychological symptoms also decreased. Contrary to their initial hypothesis, glycemic control tended to get worse over time. Luyckx, Seiffge-Krenke et al. (2010) also concluded that reciprocal mechanisms were indeed in play for adolescents, with worsening glycemic control and psychological symptoms at Time I associated with increased withdrawal coping strategies, poorer glycemic

control, and worsening psychological symptoms over the remaining three time spans. The reverse was found with active coping, with more active coping associated with better glycemic control, increased active coping activities, and decreased withdrawal coping across the time points.

Coping and resilience in adolescents with type 1 diabetes was the focus of Jaser and White's 2010 pilot study. Due to inconsistencies in the structure of coping, Jaser and White identified the need to build on previous research using measures that reflected newer conceptualization of coping. The researchers used the literature to support the need to recognize the role development plays in the coping strategies of the adolescent.

The sample included adolescents and their mothers ($n$ = 30) from a university diabetes clinic. The participants were between the ages of 10 and 16 years old with no other confounding health issues, diagnosed with diabetes for at least six months, and had to be able to speak and read English. Four instruments were used to measure the four variables; methods of coping, child competence, quality of life, and metabolic control. "Indicators of resilience" were associated with competence, quality of life, and metabolic control. Jaser and White measured methods of coping using the Response to Stress Questionnaire. Although designed to address all responses to stress, the researchers focused their analysis on three voluntary coping factors; primary control engagement coping (consisting of 9 items: problem solving, emotional modulation, emotional expression), secondary control engagement (12 items: positive thinking, cognitive restructuring, acceptance, distraction), and

disengagement coping (9 items: avoidance, denial, wishful thinking). Internal consistency measures for these subscales were $\alpha = 0.75$, $\alpha = 0.71$, and $\alpha = 0.70$ respectively (Jaser& White, 2010).

Using descriptive statistics and correlational analysis, Jaser and White found that adolescents were more likely to use secondary control coping strategies (20-36% of total stress response) followed by primary control coping (13-28%), and disengagement coping strategies (11-25%) when dealing with diabetes stress. Greater use of primary control coping strategies was associated with higher competency scores ($r = 0.39$, $p < 0.05$), better diabetes quality of life ($r = 0.54$, $p < 0.05$), and better metabolic control ($r = -0.42$, $p < 0.05$). As the use of primary control coping strategies increased, HbA1c values decreased. Greater use of secondary coping strategies was related to higher parent reported social competence ($r = 0.37$, $p < 0.05$), better total quality of life $r = 0.54$, $p < 0.001$), and better metabolic control ($r = - 0.43$, $p < 0.05$). Greater use of disengagement coping strategies was related to lower social competence ($r = -0.48$, $p < 0.05$) and poor metabolic control ($r = 0.04$, $p < 0.05$) (Jaser & White, 2010).

**Summary of coping.** Adolescents and young adults use an array of coping strategies when dealing with chronic illness. Studying adolescents with chronic illnesses such as end stage renal disease, HIV, and diabetes, researchers have looked to identify coping strategies within specific coping constructs. Coping constructs most often associated with positive adaptive behaviors are identified as active coping, problem focused coping, or primary control coping. Passive coping, emotional

focused coping, or disengagement coping are forms of coping most associated with maladaptive outcomes, and duration and quality of illness. There are inconsistences among studies regarding the conceptualization of these coping constructs and how they are measured. Coping strategies used to identify coping constructs vary from study to study (Graue et al., 2004; Jaser & White, 2010; Luyckx, Seiffge-Krenke et al., 2010; Oban et al., 2010).

Knowledge gaps remain in determining how to conceptualize and define coping within the adolescent population and how it may change across the developmental stages (Garcia, 2009). Populations studied most often include adolescents between the ages of 10 to 18 years old. Few researchers have looked to study coping in the older adolescent and young adult (18-30 years old). There is a paucity of studies examining the relationship between coping and resilience in the AYA with type 1 diabetes.

**Measurement of Coping.** Garcia (2010) identified a wide range of coping measures congruent with adolescent development across a wide range of stressors including chronic illness. Instruments most commonly used included the Adolescent Coping Orientation for Problem Strategies Questionnaire (A-COPE), the Adolescent Coping Scale (ACS), the Coping Response Inventory (CRI), the Stress and Coping Questionnaire for Children (SCQ), and the Ways of Coping Checklist (WOCC). According to Garcia, all of these measures reflected sound theoretical and congruent conceptualization of adolescent coping. Coping instruments most congruent with Lazarus and Folkmans' theory of cognitive appraisal and coping included the A-

COPE, ACS, WOCC, and the Jalowiec Coping Scale. Despite this wide range of coping measures, Garcia found a lack of uniformity in the choice of measures used to assess adolescent coping that could be meaningful and represented across studies. Rather than develop new coping measures there is a need to modify and adapt already exiting measures that are valid for adolescents at various developmental stages (Garcia, 2010).

***Jalowiec Coping Scale.*** Looking to study coping and stress in hypertensive and emergency room patients, Jalowiec (2003) found instruments available at that time to be limited to interview formatting, covered only a limited range of coping strategies, or applicable to only a select population. Jalowiec developed the Jalowiec Coping Scale to be broad based and general enough to be used to cover a wide range of stressors. Jalowiec based the conceptual foundation from her original version, on work done by Lazarus and fellow researchers (Lazarus, 1966; Lazarus & Folkman, 1984; Lazarus & Launier, 1978).

The original Jalowiec Coping Scale consisted of 40 coping strategies. Jalowiec selected the items based on work done by Lazarus and Launier (1978) on coping, stress, and adaptation. Twenty nurse judges classified the items as either problem oriented or effective oriented. With 85% agreement, 15 problem oriented and 25 affective oriented items were identified (Jalowiec, Murphy, & Powers, 1984). Coping scale test-retest reliability based on 28 subjects from a general population (retesting after two weeks) showed a significant ($p < .001$) Spearman's rank-ordering reliability coefficients (rhos) of 0.79 for total scoring, 0.85 for problem-oriented

scores, and 0.86 for affective scores. A one month re-test of 30 subjects also showed significant ($p < .001$) rhos of 0.78 for total scores, 0.84 for problem-oriented scores, and 0.83 for affective scores (Jalowiec et al., 1984). Cronbach's alpha was 0.86 (Jalowiec et al., 1984) based on coping scale data from 141 subjects in the combined sample of hypertensive patients, emergency room patients, and a general population, (Jalowiec & Powers, 1981), and dialysis patients (Baldree, Murphy & Powers; Swanson, 1982). This supported the internal consistency reliability for the instrument.

In order to further substantiate the construct validity and to identify the dimensions underlying coping behavior, Jalowiec et al. (1984) examined the coping scale data ($N$=141) using factor analysis. Using an eigenvalue of one or greater, the researchers found a two-factor solution which was then analyzed to evaluate the validity of the dichotomous classification of the coping behaviors, problem versus affective. Although 80% of the coping scale items identified as problem-oriented loaded on Factor I, only 56% of the affective-oriented items loaded on factor II. Alternate factor solutions were then examined resulting in a four-factor solution with Cronbach's alpha for the four factors ranging from 0.55-0.86 (Jalowiec et al., 1984).

Further empirical research (Jalowiec, 1988) led to revisions of the original scale (Jalowiec, 2003). Based on an extensive literature review, Jalowiec added, combined, or deleted coping behaviors from the instrument, expanding the JCS from 40 items to 60 items. With the addition of 20 items, and exploratory and confirmatory factor analysis showing an over simplification of the dichotomous classification of the coping strategies, Jalowiec (2003) used thematic clustering to

derive related clusters of similar coping strategies to generate a multidimensional model of coping. This process resulted in a model consisting of eight coping styles (confrontive, evasive, optimistic, fatalistic, emotive, palliative, supportant, and self-reliant; Jalowiec, 2003).

Reliability and validity of the revised JCS is supported by data obtained from a 10 year NIH study on heart transplant patients ($N$ = 550). Cronbach's alpha for JSC total use score was 0.93 with Cronbach's alpha for the subscales as follows: confrontive 0.81, evasive 0.78, optimistic 0.78, fatalistic 0.49, emotive 0.63, palliative 0.55, supportant 0.63, and self-reliant 0.69. Using the JCS to measure coping (Grady et al., 2001) of individuals with left ventricular assist devices waiting for a new heart ($N$ = 81), Grady found the Cronbach's alpha to range from .83-.90 for the subscales and total use scores (Jalowiec, 2003). Psychometric properties of the JCS as reported by multiple researchers continue to support the reliability and validity of this coping scale across a large range of circumstances and populations (Jalowiec, 2003).

Despite the uncertainty in regards to classifying coping strategies, Jalowiec developed her original coping scale based on a dichotomous construct of problem-focused versus emotional coping model. Jalowiec expanded the bi-dimensional model of coping to a multi-dimensional model of coping consisting of eight subscales: confrontive, evasive, optimistic, fatalistic, emotive, palliative, supportant, and self-reliant. Haase et al, (2013) has realigned five of these coping subscales (confrontive, optimistic, supportant, avoidant, evasive, and emotive) back to a bi-dimensional

construct within the resilience model, courageous coping versus defensive coping (Haase et al, 2014).

The Resilience in Illness Model conceptualizes coping within a resilience framework. Haase et al. (2014) identify coping strategies, based on the Jalowiec Coping Scale, which fit into the broader constructs of courageous coping and defensive coping. Courageous coping enhances resilience where as defensive coping either affects resilience negatively or enhances resilience when mediated by courageous coping (Haase, 2004; Haase et al., 2014).

Research is needed to further the understanding of the resilience process, in order to identify and strengthen resources needed to expand positive growth and promote wellbeing in the adolescent and young adult suffering from chronic illness. There is a paucity of studies examining the relationships between coping and resilience within the population of AYAs with type I diabetes.

**Conclusions.** Researchers have identified diabetes as one of the most common metabolic disorders among children and adolescents (Whittemore et al., 2010). As a chronic illness, type 1 diabetes remains a significant health concern among AYA. Long term complications such as retinopathy, nephropathy, and vascular disease continue to pose a threat to general wellbeing (Donoghue et al., 2009; Perfect & Jarmillo, 2012). Psychological problems, such as anxiety and depression, are common, often leading to suboptimal self-management (Herzer & Hood, 2010). Researchers have identified type 1 diabetes as a significant stressor for the AYA who must manage the complex demands of intensive diabetes management

during a significant developmental transition (Ahern, 2006; Arnett, 2010; Seiffge-Kerenke & Stemmler, 2003).

Haase et al., (2014) have conceptualized coping within a resilience framework. Coping, identified within the RIM, consists of two distinct variables, courageous coping and defensive coping. Each variable consists of a set of coping strategies which play a significant role in the process of resilience in the AYA (Haase et al., 2014; Jalowiec, 2011). Courageous coping is composed of positive/protective coping strategies which promote resilience. Defensive coping strategies affect resilience adversely unless mediated by courageous coping (Haase et al., 2014). The use of a positive health model, such as RIM, will add new knowledge to fill the gaps in understanding the relationships between and among these coping strategies and resilience in AYA with type 1 diabetes.

# Chapter III

# METHODOLOGY

The purpose of this study was to examine the relationships between and among positive and defensive coping strategies and resilience, three factors in the RIM, in adolescents and young adults with type 1 diabetes. This study specifically explored the relationships between and among the variables courageous coping, defensive coping, and resilience in the adolescent/young adult (AYA) diagnosed with type I diabetes for at least a year. This chapter provides an overview of the research design, sample and population, recruitment, and setting of this study. Information related to measurement and data analysis including instruments, power, data collection procedures, and statistical analyses is presented. Ethical considerations and protection of study participants is also addressed.

## Study Design

A descriptive correlational design was used to explore the relationships among and between courageous coping, defensive coping, and resilience. Since there exists a paucity of studies in the literature related to courageous coping strategies, defensive coping strategies, and resilience in AYA with type 1 diabetes, this study design was used to describe these relationships using a convenience sample obtained via diabetes organizations' Facebook and Forum pages, a College Diabetes Network chapter meeting, as well as at Juvenile Diabetes Research Foundations' (JDRF) sponsored events. Data from descriptive correlational studies can lead to hypotheses for later

work (Burns & Grove, 2009) as well as add additional information to the present body of knowledge.

**Description of the Population and Setting**

The population of interest in this study was adolescents and young adults (18-30 years old) diagnosed for at least one year with type 1 diabetes who spoke and were able to read English. Following SHU IRB approval, this population was recruited via diabetes organizations' Facebook pages (College Diabetes Network, Students with Diabetes, Young Adults with Diabetes, and Adults Living with Diabetes) and Diabetes Daily's Forum page. College Diabetes Network (CDN), was created to provide resources and support to young individuals preparing for college, life on campus, and real world experiences. It is a student led group which allows students to connect with others with concerns related to their type 1 diabetes (T1D). CDN's website was design to facilitate communication between students and universities resulting in the establishment of new chapters at universities throughout the country (collegediabetesnetwork.org). Heels and Hearts is a CDN chapter at the University of North Carolina.

Students with Diabetes is another organization which focuses on young adults with type 1 diabetes specifically between the ages of 18-30. Located at the University of South Florida College of Public Health, its purpose is to establish chapters at colleges and communities across the country, present national conferences on young adults living with diabetes, provide national internships for students with

type 1 diabetes, and to provide opportunities for students to participate in research projects (studentswithdiabetes.com).

The Juvenile Diabetes Research Foundation (JDRF) is a global organization funding T1D research with the mission to cure, prevent, and treat T1D (JDRF.org/). TypeOneNation (TypeOneNation.org) is a JDRF affiliate which is a social network for people with T1D. It was created and is controlled by the type 1 diabetes community to provide an exchange of ideas, information, answers, and support. Anyone over the age of 13 can participate. JDRF chapters provide opportunities for fund raising such as JDRF One Walk Events, and support, education, and research updates through TypeOneNation Summits and events. The JDRF greater Cheaspeake and Potomac chapter provide support for adults living with type 1 diabetes through their Facebook site AT1.

The online web survey company SurveyMonkey™ was selected as the method for obtaining the completed surveys. Internet based populations have multiple advantages. According to Wright (2005), the internet is a rich domain for conducting research with hundreds of thousands of people regularly engaging in every topic conceivable. Using the internet enables researchers to reach populations that are unique, such as those with chronic conditions including diabetes. Internet access allows researchers the ability to reach individuals across large geographical areas, as well as those individuals less likely to want to meet face to face (Wright, 2005).

According to the Pew Research Internet Project (2013), 90% of individuals between the ages of 18 to 29 years use social networking. Young people have also been identified as the population group most likely to use social networking sites on their cell phones or smart phones. According to a September 2012 Pew Research survey (2013), 72% of internet users reported using the internet to obtain medical information within the past year. As a cost effective and time saving option, a web-based survey company is an acceptable method to access the population of interest. The researcher also distributed surveys at JDRF One Walk Events, JDRF TypeOne Nation Summit, JDRF Young Leadership committee meeting, and College Diabetes Network subchapter (Heels and Hearts) meeting.

**Sample Size and Statistical Power**

A power analysis was conducted to determine the appropriate sample size. This study included 3 main variables: courageous coping, defensive coping, and resilience. A sample size calculator (Faul, Erdfelder, Buchner, & Lang, 2009) was used a priori to determine the neccessary number of participants to adequately address the research questions. According to the G3Power calculator, to achieve a .80 power level with an effect size of .15, and acceptable error (.05) in a linear multiple regression using 2 predictor variables (courageous coping, defensive coping, and ) and one criterion variable (resilience), a minimum sample size of 66 was required.

**Research Instruments**

Instruments were selected for this study based on their relevance to the research question, congruence with the theoretical framework, appropriateness for the

population, and psychometric properties including reliability and validity. Availability of the instrument and ease of completion for participants were also considered.

**Jalowiec Coping Scale (JCS).** The Jalowiec Coping Scale (Jalowiec, 2011) has been used both nationally and internationally, used across a wide range of disciplines in both research and clinical projects, and has been deemed appropriate for adults including the elderly and adolescents. At least 11 studies have used the Jalowiec Coping Scale to measure adolescent coping ( Barron & Yoest, 1994; Keller & Nicholls,1990; Koller, 1991; Puskar, Lamb, & Bartolovic, 1993; Lamb, Puskar, Sereika, & Corcoran, 1998; Myors, Johnson, & Langdon, 2001; Puskar, Lamb, &Tusaie-Mumford, 1997; Puskar & Rohay, 1999; Scoloveno, Yarcheski, & Mahon, 1990; Russel, Subramanian, Russel, & Nair, 2012; Yarcheski, & Mahon, 1986). The literature supported the reliability and validity of the JCS. Based on 27 studies, Jalowiec (2003) reports a mean Cronbach's alpha of .88 for the Jalowiec Coping Scale with the mean Cronbach's alpha for the eight subscales ranging from .47- .86. Researchers have used the Jalowiec Coping Scale in both well and clinical populations including those with diabetes (Willoughby, Demi, & Parker, 2000). Used for over 30 years, the purpose of the Jalowiec Coping Scale is to measure the degree of use and perceived effectiveness of 60 cognitive and behavioral coping strategies with numerous types of physical, emotional, and social stressors (Jalowiec, 2011).

The JCS was developed to measure coping behaviors used by hypertensive and emergency room patients (Jalowiec et al., 1984). The researchers identified forty

coping behaviors from an extensive review of the literature. Twenty nurse judges reached 85% agreement in identifying coping styles as either problem oriented (15 items) or affective oriented (25 items). Factor analysis ($N$ = 141) resulted in a two factor solution with 80% of the problem items loading on Factor I but only 56% of the affective items loading on Factor II. Further empirical research based on the review of the literature resulted in expanding the JCS from 40 items to 60 items. With exploratory and confirmatory factor analyses showing an over simplification of the dichotomous classification of the coping behaviors (problem vs affective), thematic clustering of similar coping strategies was used to generate this multidimensional model of coping (Jalowiec, 2003).

The Jalowiec Coping Scale (APPENDIX A) consists of 60 items classified into eight subscales of coping styles (confrontive, evasive, optimistic, fatalistic, emotive, palliative, supportant, and self-reliant). The subscales have been evaluated to be at a 6th grade reading level and can be administered by either self-administration or by an interview. The complete scale takes 10-15 minutes to complete. The subscales may be scored separately for coping use (Part A) and/or for coping effectiveness (Part B), or they may be scored for overall use and effectiveness (Jalowiec, 2011). Only coping use was used for this study as supported by the RIM. In the design of the JCS, all items for all subscales are mixed. Items are not separated by subscales. To maintain the integrity of the JCS, all 60 items measuring the eight coping styles were administered. Only the subscales for confrontive, optimistic, supportant (courageous coping), evasive, and emotive (defensive coping) were scored

and used for this study. All items are rated on a four point (0-3) Likert-type scale with higher scores reflecting greater use of the identified coping style. All subscale Cronbach's alphas are based on data obtained from a 10 year NIH study on heart transplant patients ($N$ = 550) (Jalowiec, 2003).

***Courageous Coping***. To measure courageous coping, the confrontive coping style, the optimistic coping style, and the supportive coping styles were used. These JCS subscales were chosen based on the operational definition of courageous coping as defined in the Resilience in Illness Model (Haase et al., 2014). Unlike the RIM, where only the subscale scores were used to measure courageous coping, courageous coping in this study was the summation of the subscales confrontive, optimistic and supportant.

*Confrontive Coping Style.* The Confrontive Coping JCS subscale is a 10-item Likert scale self-report instrument. The total score for degree of use of confrontative coping styles (constructive problem-solving, facing up to and confronting the problem or situation) range from 0-30. Cronbach's alpha for confrontive coping is 0.81 (Jalowiec, 2003).

*Optimistic Coping Style.* The Optimistic Coping JCS subscale is a 9-item scale. The total score for degree of use of optimistic coping strategies (maintaining a positive attitude about a problem) ranges from 0-27 (*α=0.78).*

*Supportant Coping Style.* The Support Coping Style is a 5-item JCS subscale. The total score for degree of use of supportant coping strategies (using support systems to cope [person, professional, spiritual]) ranges from 0-15 (α=0.63).

***Defensive Coping.*** To measure defensive coping, the evasive and emotive coping styles subscales of JCS were used. These scales were chosen based on the operational definition of defensive coping as defined in the Resilience in Illness Model (Haase et al., 2014). Unlike the RIM, defensive coping was measured using the summation of the emotive and evasive subscales.

*Evasive Coping Style.* The Evasive Coping Scale is a 13 item JCS subscale. The total score for degree of use of evasive coping strategies (doing things to avoid dealing with the problem) ranges from 0-39 ($\alpha$=0.78).

*Emotive Coping Style*. The Emotive Coping Scale is a 5-item JCS subscale. The total score for the degree of use of emotive coping strategies (worrying, releasing emotions, being impulsive, and self-blaming) ranges from 0-15 ($\alpha$ = .51). Permission to use and upload the JSC, for online use was obtained via e-mail communication from Dr. Jalowiec (APPENDIX B).

**The Resilience Scale (RS).** The RS by Wagnild (APPENDIX C) consists of 25 items reflecting five characteristics (a purposeful life, perseverance, equanimity, self-reliance, existential aloneness) and two factors (acceptance of self, and personal competence) which reflect the theoretical definition of resilience (Wagnild, 2011; Wagnild & Young, 1990; Wagnild & Young, 1993). Cronbach's alpha coefficients for the RS, range from 0.84-0.94 (Wagnild &Young, 1993). According to Wagnild (2009), studies using the Resilience Scale with adolescents and young adults demonstrated Cronbach's alpha coefficients ranging from 0.72-0.91 (Black & Ford-Gilboe, 2004; Hunter & Chandler, 1999; Rew, Taylor-Seehafer, Thomas, & Yocky,

2001). According to Wagnild (2009), the Resilience Scale has been requested for use by over 4,500 researchers, organizations, and clinicians and has been used in a wide range of age groups including adolescents and young adults with diabetes (Winsett, Stender, Gower, & Burghen, 2010).

The RS is a 25 item (5 items per characteristic) Likert Scale with 7 possible responses from 1 (strongly disagree) to 7 (strongly agree). All items are positively worded with higher scores reflecting greater resilience. Written at a 6th grade reading level, the RS takes approximately 5-7 minutes to complete. The RS is scored as a total score rather than scores for each of the five characteristics. The total score ranges from 25-175 (Wagnild, 2009).

The Resilience Scale was developed from two studies, a 1987 qualitative study of 24 older women who had successfully coped with recent loss, such as a loss of a spouse, and a qualitative study of 39 caregivers of spouses with Alzheimer's disease (Wagnild, 2009; Wagnild & Young, 1991). From these qualitative studies the five essential characteristics of resilience were identified (self-reliance, purposeful life [meaning], equanimity, perseverance, and existential aloneness). The initial Resilience Scale consisted of 50 verbatim statements from these qualitative studies. Initial analysis resulted in an instrument with 25 items (Wagnild, 2009; Wagnild, 2009). The 25-item RS was tested on a large sample ($N$ = 782) of middle aged and older women between the ages of 53-95 years old (Wagnild & Young, 1993). Internal consistency reliability was strong ($r$ = 0.91). Scores ranged from 25-175 with scores greater than 145 indicating moderately high to high resilience, 121-145

indicating moderately low to moderate resilience, and scores below 120 indicated low resilience (Wagnild, 2009). Score ranges were determined by repeated application of the Resilience Scale with a variety of samples (Wagnild, 2009). The RS has been used with AYAs (Black et al., 2004; Hunter & Chandler, 1999: Rew, Taylor-Seehafer, Thomas& Yockey, 2001). Cronbach's alphas presented in these studies have ranged from .72 to .91. Dr. Wagnild granted permission via email communications to use and format the RS for online (APPENDIX D).

**Demographic Information Form.** The demographic information form consisted of items used to obtain demographic information about AYA and included questions concerning gender, marital status, education, living status, employment status, ethnic background, and age (APPENDIX E). Items were included to elicit information concerning the participant's diabetic state at the time of participation and included questions about age of onset, time since diagnosis, HbA1c levels, and the frequency of hyper- and hypoglycemic episodes. The entire survey (Demographic Information Form, Jalowiec Coping Scale, and the Resilience Scale) took approximately 15 minutes to complete).

## Ethical Considerations

Institutional Review Board at Seton Hall University granted approval to conduct this research (APPENDIX F). The instruments used to measure the study variables have been tested and used in multiple adolescent and adult populations. Participation in this study was determined to pose minimal risk to participants, meaning that no greater risk is incurred than those ordinarily encountered in daily life

(Polit & Beck, 2008). Participants were encouraged to discontinue the completion of the survey if questions were found to be disturbing. Information about the study was presented to participants at a 6th grade reading level and would be understandable by an 18-20 year old lay person. Completed surveys reflected implied voluntary consent to participate (Polit & Beck, 2008).

All data obtained was anonymous with no way to identify the participant. All data obtained from the completed study instruments were down loaded and stored on a memory key and kept in a locked, secure file cabinet accessed only by the researcher.

**Data Collection Procedures**

Volunteer subjects were recruited through diabetes organizations' Facebook pages, and Diabetes Daily Forum page (a grassroots support network and educational platform founded by David and Elizabeth Edelman with the intent to help people with diabetes live a better life). Permission to submit an invitation to participate in this research study via a shared link on Diabetes Daily Forum page as well as Adults living with Diabetes (AT1) Facebook page was obtained (APPENDIX G and H). Links to the study were also sent to College Diabetes Network, Students with Diabetes, and Young Adults with diabetes. Once approved, each of these organizations uploaded the link to their Facebook pages.

A SurveyMonkey™ professional account along with SSL encryption protection provided by SurveyMonkey for the survey links, survey pages, and exports were established. SSL encryption protection is commonly used for online banking or

sites that transmit secure information. SSL encryption protection is also recommended by SurveyMonkey to meet HIPAA compliance (SurveyMonkey, 2014). To assure limited access to the survey instruments, the survey was shut down once the population sample had been met.

A brief invitation to participate (APPENDIX I) in the study along with eligibility criteria and the password protected survey link was placed on Diabetes Daily Forum page and AT1 Facebook page by the researcher. All other invitations to join the study were placed by the organizations themselves. Once the participant had gained access to the survey link, the participant was introduced to the study via the Letter to Participants (APPENDIX J) and directed to complete the Demographic Information Form, the Jalowiec Coping Scale, (used to measure the study variables courageous coping and defensive coping), and the Resilience Scale (used to measure the variable resilience).

The researcher distributed surveys at JDRF One Walk Events, TypeOne Nation Summit, JDRF Young Leadership Committee meeting, and Heels and Heart Meeting (a College Diabetes Network chapter). Participants who completed surveys received a five dollar Starbucks gift card. The researcher purchased vendor tables at One Walk events were the Letter of Solicitation and the surveys were distributed to interested participants meeting the research criteria. Permission was obtained from TypeOne Nation Organizers (APPENDIX H) to allow for distribution of the surveys, by the researcher, at their summit conference.

The researcher, via the Letter of Solicitation, described the participant's rights as a research participant, emphasizing the voluntary nature of the study and the participant's ability to withdraw at any time without penalty. Participants were also advised that only the researcher knew of their participation, or non-participation, in the study.

The time to complete the study forms took approximately 15 minutes. The researcher recorded the responses from the participants, both from SurveyMonkey and the paper copies of the surveys, directly into the SPSS software for analysis. Once the data were obtained, they were exported offline to a thumb drive and kept in a locked drawer.

**Analysis of Data**

The data were analyzed using descriptive statistics (frequencies, means, medians, standard deviations, and percentages) for each of the main study variables and selected demographic variables (gender, age, HbA1c levels). This data were used to describe the sample, assess for outliers, and determine the distribution of variables. Inferential analyses (Analysis-of–Variance) were used to understand patterns within the demographic variables in order to best characterize the sample. Reliability calculations for the study instruments were conducted. Following descriptive summary of the data, inferential analyses were employed to answer the research question posed by this study, which attempted to determine if there are relationships between courageous coping strategies, defensive coping strategies, and resilience. Surveys not meeting the eligibility criteria (must be 18-30 years old and have a

duration of illness greater than one year) were not included in this study. Any surveys with missing items from any of the five JCS subscales or any missing items from the Resilience Scale were also excluded ($n$ = 12).

Prior to statistically examining relationships among study variables, data was analyzed to evaluate whether the assumptions necessary for multiple regression analysis (normality, linearity, independent variable co-linearity, and homoscedasticity) were met. When assumptions are not met, results may not be trustworthy resulting in Type I or Type II errors (Osborne & Waters, 2002). Nonlinear relationships may exist if the assumption of multivariate normality is violated (Green & Salkind, 2011). It is necessary therefore, to evaluate for nonlinear relationships between predictors and criterion. Scatterplots between predictors and criterion were used to determine nonlinearity. Multiple correlation indices ($R$, $R^2$, $R_{adj}$), were used to assess how well linear combinations of predictor variables in the regression analysis predicted the criterion variable. Partial correlations were used to assess the relative effects of individual predictors (Green & Salkind, 2011).

Since the relationships among the study variables have only been previously studied in a very limited number of studies, simultaneous multiple regression was employed to answer the basic question of multiple correlation among the factors (courageous coping, defensive coping, and resilience). In order to determine how strong the association was with the criterion (resilience) for each set of predictors (courageous coping and defensive coping) and how much variance was explained by

each, a sequential multiple regression of unordered sets of predictors was also conducted (Green & Salkind, 2011).

# Chapter IV

# FINDINGS

## Introduction

The purpose of this study was to explore the relationships between and among courageous coping strategies, defensive coping strategies, and resilience in adolescents and young adults with type 1 diabetes between the ages of 18- 30. This chapter begins with a description of the sample, and an overview of the data analysis procedures, and the presentation of the study findings.

## Description of Sample

Participants were invited to participate through diabetes organizations' Facebook pages such as College Diabetes Network (CDN), Students with Diabetes, Young Adults with Diabetes, and the Juvenile Diabetes Research Foundation's (JDRF) Facebook page, Adults Living with Type 1(AT1). Participants were also recruited via Diabetes Daily's Forum page. Fifty four individuals responded and started the survey on SurveyMonkey™. Individuals who did not meet the eligibility requirement for the study were automatically disqualified following the completion of the Demographic Information Form via the disqualification logic feature. Thirteen participants were found ineligible and another seven did not complete all of the instruments so were also excluded. Surveys were also distributed at JDRF One Walk Events (Greensboro, NC and Burlington, NC), CDN chapter meeting (Heels and Hearts, University of North Carolina), and the JDRF Greater Chesapeake and Potomac Chapter sponsored events (TypeOne Nation Summit), and the JDRF Young

Leadership Committee. Thirty seven completed surveys were received. Two were rejected for multiple responses on individual items of the survey and three were rejected for not completing the survey. Therefore, the total sample for analysis consisted of 66 participants. The sample size is adequate to achieve a .80 power level with an effect size of .15 and acceptable error (.05) in a linear multiple regression using to 2 sets of predictor variables (courageous coping and defensive coping) and one criterion variable (resilience) (Faul et al., 2009).

Personal demographic information was collected along with information related to the history and the present state of the participants' type 1 diabetes at the time the survey was completed. Personal demographic information included: gender, age, marital status, education, living situation, employment, and ethnic background (see Tables 1 and 2). Information related to their diabetes consisted of age of diagnosis, duration of illness, episodes of hypoglycemia and hyperglycemia per week, and most recent HbA1c.

Young women between the ages of 18-30 made up 79% of the participants ($n$ =52) while the remaining 21% where young men ($n$ = 14). Age was treated as a nominal variable with participants' ages assigned to the category which best described their age. Participants' ages were placed in one of three categories: 1 for an age category of 18-19, 2 for an age category of 20-24, and 3 for an age category of 25 to 30. Hana (2012) identifies a worsening of glycemic control in late adolescents between 18-19 years of age and an improvement in control in early adulthood. Luyckx, Vanhalst, et al. (2010) identified the emerging adult to included participants

between the ages of 18-30. Approximately 42% of participants where between the ages of 20-24 (*n* = 28) with 39% (*n* = 26) between the ages of 25-30, and 18% (*n* = 12) between the ages of 18-19.

Table 1

*Gender, Age, Marital Status (N = 66)*

| Characteristics | *n* | % |
|---|---|---|
| Gender | | |
| Female | 52 | 78.8 |
| Male | 14 | 21.2 |
| Age | | |
| 18-19 | 12 | 18.2 |
| 20-24 | 28 | 42.4 |
| 25-30 | 26 | 39.4 |
| Marital Status | | |
| Married | 10 | 15.2 |
| Single | 54 | 81.8 |
| Other | 2 | 3.0 |
| Living Situation | | |
| Alone | 7 | 10.6 |
| Friends | 32 | 48.5 |
| Spouse/Significant other | 12 | 18.2 |
| Spouse/Significant other/children | 2 | 3.0 |
| Parents/other | 13 | 19.2 |

The majority of the participants identified themselves as White or Caucasian (91%) with the remaining participants identifying themselves as Asian (3%), African American (1.5%), Hispanic (3%), or other (1.5%). Table 2 provides a description of participant ethnicity.

The most frequent living condition was living with friends (49%) with the least frequent living condition was living with a spouse/significant other with children (3%). Nineteen percent identified their living conditions as living with parents or

other. Participants identifying themselves as single were 82% with 15% identifying themselves as married.

Education was relatively evenly distributed across the categories of *completed some college* (24%), *Bachelor degree* (35%), and *graduate degree* (32 %) with the remaining 9% *completing high school*. Participants working full time made up 45% of the sample with 32% identifying themselves as full time students. See Table 2.

Table 2

*Education, Employment, Ethnicity* (*N=66*)

| Characteristics | *n* | % |
|---|---|---|
| Education | | |
| Completed HS | 6 | 9.1 |
| Completed some College | 16 | 24.2 |
| Bachelor's degree | 23 | 34.8 |
| Graduate degree | 21 | 31.8 |
| Employment | | |
| Full time employment | 30 | 45.5 |
| Part time employment | 5 | 7.6 |
| Unemployed | 6 | 9.1 |
| Full time student | 21 | 31.8 |
| Part time employment/ Full time student | 4 | 6.1 |
| Ethnicity | | |
| Caucasian/White | 60 | 90.9 |
| Asian | 2 | 3.0 |
| African American/Back | 1 | 1.5 |
| Hispanic | 2 | 3.0 |
| Other | 1 | 1.5 |

The age of diagnosis for type 1 diabetes for this sample ranged from 18 months to 27 years old ($M$ =10.9, $SD$ = 5.5). The most frequent age for diagnosis was at the age of 9. HbA1c ranged from 4.9 - 10.3 ($M$ =7.3, $SD$ =1.07). Duration of illness was categorized as 1, for 1-5 years duration or 2, for greater than 5 years

duration. Eighty five percent reported a duration of illness of greater than five years with 15% reporting a duration of illness from 1-5 years. Participants were asked to describe which category reflected their experience with hypo/hyperglycemic episodes: 1 for episodes occurring 0-1 times per week, 2 for episodes occurring 2-3 times per week, and 3 for episodes occurring greater than 3 times per week. Participants (45%) most often experienced episodes of hypoglycemia 2-3 times per week with 15% reporting episodes 0-1 times per week. A majority of participants (74%) experienced episodes of hyperglycemia greater than 3 times per week with 26% experiencing less frequent episodes.

**Description of Study Variables**

Three instruments were used to operationalize the study's main variables: Courageous Coping, Defensive Coping, and Resilience. Courageous Coping and Defensive Coping were measured using the Jaloweic Coping Scales (2011) and Resilience was measured using the Resilience Scale (Wagnild, 2009).

**Courageous Coping**. Courageous coping was operationally defined using the confrontive, supportant and optimistic subscales from the Jaloweic Coping Scale. The subscale confrontive coping consisted of a 10 item scale, with optimistic and supportant scales consisting of a 9 item and a 5 item scale respectively. Each participant responded to how often they used each coping method when dealing with the stress of having type 1 diabetes measured on a 4-point Likert Scale. Scores for each item could range from 0 (never used) to 3 (often used). The range of scores for

this sample on confrontive coping was 2-30 (*M* = 20.8, *SD* = 5.0), optimistic coping 8-27 (*M* = 19.6, *SD* = 4.3), and supportant coping 0-15 (*M* = 7.7, *SD* = 3.3).

**Defensive Coping.** The Defensive Coping variable was operationally defined using the subscales Evasive Coping subscale and the Emotive Coping subscale from the Jalowiec Coping Scale. These 4 point Likert scales consisted of 13 and 5 items respectively ranging from 0 (never used) to 3 (often used). Range of scores for this sample on the evasive coping subscale was 2-34 (*M*= 15.7, *SD*= 6.9) and for emotive coping was 0-12 (*M*= 6.2, *SD*= 2.6).

Potential and actual means, standard deviations, range of scores, and Cronbach's alpha for this sample is provided in Table 3. Although a coefficient of 0.80 is desired, a coefficient of 0.70 is deemed acceptable (Burns & Grove, 2009).

Table 3

*Results for Courageous Coping, Defensive Coping, Resilience Scale (N = 66)*

| | Actual Range of Scores | *M* (*SD*) | Potential Range of Scores | Cronbach's Alpha *N* = 66 | Cronbach's Alpha |
|---|---|---|---|---|---|
| Courageous Coping | 16-66 | 48.1 (10.1) | 0-72 | .85 | JCS |
| Confrontive | 2-30 | 20.8 (5.0) | 0-30 | .78 | .81 |
| Optimistic | 8-27 | 19.6 (4.3) | 0-27 | .72 | .78 |
| Supportant | 0-15 | 7.7 (3.3) | 0-15 | .68 | .63 |
| Defensive Coping | 3-46 | 21.8 (8.7) | 0-54 | .85 | JCS |
| Evasive | 2-34 | 15.7 (6.9) | 0-39 | .83 | .78 |
| Emotive | 0-12 | 6.2 (2.6) | 0-15 | .51 | .63 |
| Resilience Scale | 102-170 | 144.6 (15.3) | 25-175 | .89 | RS .85-.94 |

**Resilience Scale.** The Resilience Scale was used to operationally define resilience and was made up of a 25 item, 7 point Likert Scale. The participants were asked to respond with a score of one to items with which they strongly disagreed and 7 for items with which they strongly agreed. The sample range of scores was from 25-175 (*M*= 144.6, *SD*= 15.3).

Table 4

*Results for Courageous Coping, Defensive Coping, Resilience by Gender*

| | Female (*n* = 52) *M* (*SD*) | Male (*n* = 14) *M* (*SD*) |
|---|---|---|
| Courageous Coping | 52.0 (8.4)* | 40.4 (12.3) |
| Confrontive | 21.8 (4.0) | 17.4 (6.6) |
| Optimistic | 20.10 (4.0) | 17.9 (5.2) |
| Supportant | 8.3 (3.1) | 5.3 (3.4) |
| Defensive Coping | 22.19 (9.2) | 20.4 (6.6) |
| Evasive | 15.8 (7.3) | 15.4 (5.4) |
| Emotive | 6.5 (2.6) | 5.0 (2.3) |
| Resilience Scale | 146 (15.2) | 139.14 (15.2) |

*$p < .05$

**Gender.** Each variable was further analyzed based on gender. These are depicted in Table 4. Female participants had higher mean scores overall on both Courageous Coping (*M* =52.0, *SD*= 8.4) as well as on the Defensive Coping (*M* = 22.2, *SD* = 9.2) than males (courageous coping [ *M* = 40.4, *SD* = 12.3], defensive coping [ *M* = 20.4, *SD* = 6.6]). Female participants also had higher mean scores on the Resilience Scale (*M* = 146, *SD* = 15.2) than their male counterparts (*M* = 139.1, *SD* = 15.2). An overall analysis-of-variance test (ANOVA) was conducted to assess whether the means among females and males on courageous coping, defensive coping, and resilience were significantly different. The results for the analyses by

gender for courageous coping shows that the overall ANOVA was significant, $F$ (1, 64) = 11.98, $p$ = .001 (see Table 5, Tests of Between-Subjects Effects).

Table 5

*Tests of Between-Subjects Effects*

| Dependent Variable: courageous | | | | | | |
|---|---|---|---|---|---|---|
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared |
| Corrected Model | 1050.342[a] | 1 | 1050.342 | 11.977 | .001 | .158 |
| Intercept | 90286.099 | 1 | 90286.099 | 1029.539 | .000 | .941 |
| Gender | 1050.342 | 1 | 1050.342 | 11.977 | .001 | .158 |
| Error | 5612.522 | 64 | 87.696 | | | |
| Total | 159015.000 | 66 | | | | |
| Corrected Total | 6662.864 | 65 | | | | |

a. R Squared = .158 (Adjusted R Squared = .144)

The Partial Eta Square of .16 indicates a medium relationship between gender and courageous coping. Post hoc tests were not performed for gender because there are fewer than three groups. The Levenen's Test of Equality of Error Variance (Table 6) was non-significant therefore the population variance for the two groups is equal. The ANOVA analysis between gender and defensive coping and resilience were both non-significant.

Table 6

*Levene's Test of Equality of Error Variances*

| Dependent Variable: Courageous | | | |
|---|---|---|---|
| F | df1 | df2 | Sig |
| 3.631 | 1 | 64 | .061 |

Note. Tests the null hypothesis that the error
Variance of the dependent variable is equal across groups.
a. Design: Intercept + Gender

**Age.** Each variable was analyzed by age category. See Table 7. AYAs aged 18-19 years had higher mean scores on both courageous coping scores ($M$ = 50.5, $SD$ = 7.5) and defensive coping ($M$ = 23.9, $SD$ = 6.7), with 25-30 year olds having higher mean scores on the resilience scale scores ($M$ = 146.4, $SD$ = 15.7). An analysis-of-variance test (ANOVA) was conducted to assess whether the means on courageous coping, defensive coping, and resilience were significantly different between age groups. The ANOVA analysis of all three age groups and courageous coping, defensive coping, and resilience were all non-significant.

Table 7

*Results for Courageous Coping, Defensive Coping, Resilience by Age (N = 66)*

| | 18-19<br>*M* (*SD*)<br>*n* = 12 | 20-24<br>*M* (*SD*)<br>*n* = 28 | 25-30<br>M (SD)<br>*n* = 26 |
|---|---|---|---|
| Courageous Coping | 50.5 (7.5) | 47.2 (11.2) | 47.9 (19.5) |
| Confrontive | 21.5 (2.9) | 20.1 (5.7) | 7.1 (3.4) |
| Optimistic | 21.0 (4.1) | 19.1 (4.3) | 19.5 (4.5) |
| Supportant | 8.0 (4.4) | 8.0 (2.9) | 7.1 (3.4) |
| Defensive Coping | 23.9 (6.7) | 21.1 (8.2) | 21.6 (10.2) |
| Evasive | 17.8 (5.3) | 15.0 (6.4) | 15.6 (8.1) |
| Emotive | 6.2 (2.6) | 6.1 (2.5) | 6.23 (2.8) |
| Resilience | 143.8 (13.9) | 143.2 (15.9) | 146.4 (15.7) |

## Statistical Analyses

Each variable was examined to determine whether it met the assumptions for multiple linear regression including normal distribution, homoscedasticity, linearity, absence of multicollinearity, and no undue influence of outlier scores (Green & Salkind, 2011). Kolmogorov-Smirnov Test of Normality evaluated normal

distribution. This test evaluates whether the data on a quantitative variable is normally distributed. According to Green and Salkind, this is the preferred test for making comparisons with a normal distribution. The courageous coping subscale confrontive was significant with a *p* value of .009, (*M* = 20.8, median = 22) and was negatively skewed. The optimistic subscale was significant in Kolmogorov-Smirnov test with a *p* value of .05 and negatively skewed. The supportant subscale, defensive coping, and each of the defensive coping subscales were normally distributed. The Resilience Scale was non-significant with Kolmogorov-Smirnov Test. Outliers where identified via Q-Q plots. Error did not appear to be responsible for the outliers identified. One data point identified in the confrontive subscale three standard deviations from the mean was removed and the mean and median was recalculated. With a mean of 21.1 and median of 22.5, the distribution remained negatively skewed. According to Witte and Witte (2010), an accurate score should be treated as a legitimate score and not suppressed. If viewed as a special circumstance, outliers may add value to the understanding of the data. According to Green and Salkind, if the population size is moderate to large the test of slope will result in a reasonable accurate *p* value even if normality assumptions are violated.

Homoscedasticity and linearity were analyzed via scatter plots. These assumptions appear to have been met, as shown in Figure 2.

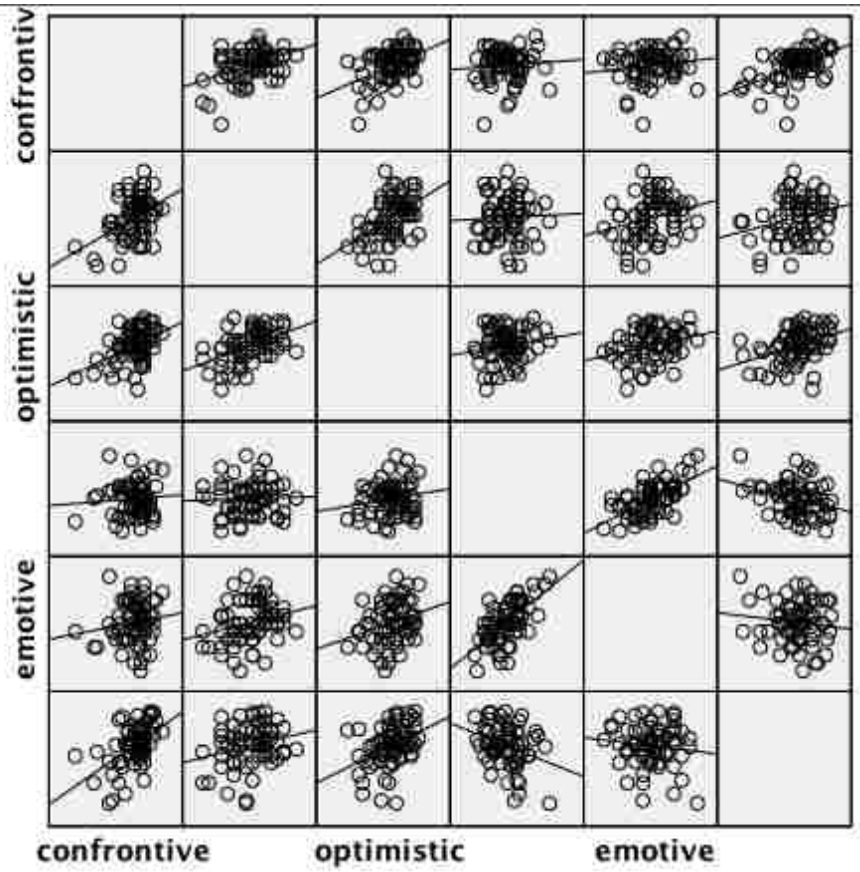


Figure 2. Scatter plots for confrontive, supportant, optimistic, evasive, emotive, and resilience.

Collinearity tests (Tolerance, Variance inflation factor [VIF], and Condition index) showed no multicollinearity. Tolerance scores for the predictor variables (confrontive, optimistic, supportant, evasive, and emotive) ranged from .54 -.73. VIF scores ranged from 1.4 to 1.9 with the condition index all less than 30.

**Simple Linear Regression.** In order to more accurately understand the effect type 1 diabetes had on the study population, a linear regression analysis was next conducted to evaluate the prediction of resilience from HbA1c values. The scatterplot

for the two variables, as shown in Figure 2, indicates that the two variables have a negative linear relationship such that as HbA1c values decrease Resilience Scale scores increase.

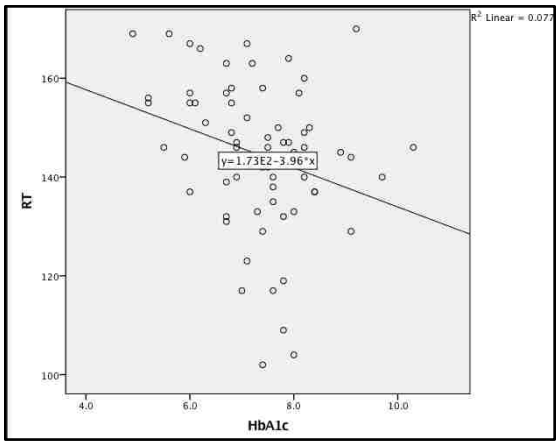


Figure 3. Scatter plot for HbA1c and Resilience

The regression equation used for predicting the Resilience Scale Score is: *Predicted Resilience Scale score* = - 3.96 *HbA1c* +173.15. The 95% confidence interval for the slope, -7.383 to -.528 does not contain the value of zero, therefore HbA1c values are significantly negatively related to Resilience Scale Scores ($p <$ .05). Accuracy in predicting Resilience from HbA1c was small. The correlation between HbA1c values and Resilience Scale was weak (-.28). Approximately 8% of the variance of the Resilience Scale Score was accounted for by its linear relationship with the HbA1c values (see Tables 8 and 9).

Table 8

*Model Summary of the Bivariate Linear Regression of HbA1c and Resilience*

| Model | R | R Square | Adjuster R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .277[a] | .077 | .062 | 14.845 |

a. Predictors: (Constant), HbA1c

Table 9

*Coefficients of the Bivariate Linear Regression of HbA1c and Resilience*

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. | Lower Bound | Upper Bound |
| 1 | (Constant) | 173.499 | 12.689 | | 13.673 | .000 | 148.149 | 198.849 |
| | HbA1c | -3.956 | 1.716 | -.277 | -2.306 | .024 | -7.383 | -.528 |

a. Dependent Variable: RT

Bivariate linear regression analyses were then conducted to evaluate the prediction of resilience by gender and to evaluate the prediction of resilience by age. A Spearman's rank correlation coefficient was used in this analysis. The Spearman's correlation coefficient is a nonparametric correlation used when intervals between scores lack quantitative meaning such as in gender when numerical codes are assigned (Green & Salkind, 2011; Witte & Witte, 2011). Both bivariate linear regression analyses were non-significant at the $p < .05$ level (see Table 9).

**Bivariate Correlation within Main Study Variables.** Data integrity was accounted. Bivariate correlations between pairs of main study variables were then conducted (see Table 10). Correlation coefficients were computed among the five subscale coping strategies and the Resilience Scale. Using the Bonferroni approach

to control for Type 1 error across 15 relationships, a $p < .003$ (.05/15 = .003) was required for significance. The results of the correlational analysis presented in Table 10 shows 6 of the 15 correlations were statistically significant. According to Green and Salkind (2011), for the behavioral sciences correlational coefficients of .10,

Table 10

*Correlation Table for Main Study Variables*

| Correlations | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | confrontive | optimistic | supportant | evasive | Emotive | RT |
| confontive | Correlation | 1 | | | | | |
| | Sig. (2 tailed) | | | | | | |
| | N | 66 | | | | | |
| optimistic | Correlation | .455** | 1 | | | | |
| | Sig. (2 tailed) | .000 | | | | | |
| | N | 66 | 66 | | | | |
| supportant | Correlation | .430** | .478** | 1 | | | |
| | Sig. (2 tailed) | .000 | .000 | | | | |
| | N | 66 | 66 | 66 | | | |
| evasive | Correlation | .078 | .169 | .042 | 1 | | |
| | Sig. (2 tailed) | .532 | .174 | .740 | | | |
| | N | 66 | 66 | 66 | 66 | | |
| emotive | Correlation | .148 | .279* | .257* | .636** | 1 | |
| | Sig. (2 tailed) | .235 | .023 | .037 | .000 | | |
| | N | 66 | 66 | 66 | 66 | 66 | |
| RT | Correlation | .516** | .389* | .248* | -.311* | -.122 | 1 |
| | Sig. (2 tailed) | .000 | .001 | .045 | .011 | .329 | |
| | N | 66 | 66 | 667 | 66 | 66 | 66 |

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

.30, and .50 are interpreted as small, medium, and large respectively. There were medium correlations between confrontive, optimistic, and supportant (courageous

coping subscales) ranging from .43 to .48. The defensive coping subscales (emotive and evasive) were also strongly correlated at .63. For the five subscales and the resilience scale, a statistically significant large correlation was shown between the resilience scale and the confrontive scale (.51) and a medium correlation (.39) with the optimistic scale. Correlations between supportant, evasive, and emotive scales were not significant at the .003 level.

**Multiple Linear Regression.** A multiple regression analysis was conducted to evaluate how well a linear combination of coping strategies made up of one set of the five subscales (confrontive, optimistic, supportant, evasive, emotive) predicted resilience. The regression equation with all five coping subscales as predictors was significantly related to the resilience scale, $R^2 = .45$, adjusted $R^2 = .40$, $F\ (5, 60) = 9.64$, $p < .05$). The $R^2$ indicated that approximately 45% of the variance of the resilience scale score was accounted for by the linear combination of the coping subscales (see Tables 11-13).

Table 11

*Multiple Regression Summary Model: One Set*

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .667[a.] | .445 | .399 | 11.883 |

a. Predictors: (Constant), emotive, confrontive, supportant, optimistic, evasive

Table 12

*Multiple Regression Results: One Set*

| Anova[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Sum of Squares | df | Mean Square | F | Sig |
| 1 | Regression | 6804.391 | 5 | 1360.878 | 9.638 | .000[b] |
| | Residual | 847.973 | 60 | 141.200 | | |
| | Total | 15276.364 | 65 | | | |

a. Dependent Variable: RT
b. Predictors: (Constant), emotive, confrontive, supportant, optimistic, evasive

Table 13

*Multiple Regression Coefficients Results: One Set*

| | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% Confidence Interval for B | | Correlations | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model 1 | B | Std. Error | Beta | T | Sig. | Lower Bound | Upper Bound | Zero order | Partial | Part |
| (Constant) | 1123.212 | 8.053 | | 13.934 | .000 | 96.103 | 128.321 | | | |
| confrontive | 1.373 | .347 | .444 | 3.958 | .000 | .679 | 2.067 | .516 | .455 | .381 |
| optimistic | 1.003 | .415 | .283 | 2.414 | .019 | .172 | 1.834 | .389 | .298 | .232 |
| supportant | -.279 | .533 | -.061 | -.524 | .602 | -1.345 | .786 | .248 | -.068 | -.050 |
| evasive | -.864 | .282 | -.388 | -3.064 | .003 | -1.428 | -.300 | -.311 | -.368 | -.295 |
| emotive | -.024 | .768 | -.004 | -.031 | .975 | -1.560 | 1.513 | -.122 | -.004 | -.003 |

Note. Dependent Variable: RT

Table 14, presents the indices which indicate the relative strength of the individual predictors. As expected, three of the five bivariate correlations between coping strategies subscales and resilience were positive (confrontative, optimistic, and supportant) and the remaining two (evasive and emotive) were negative. Four of the five coping strategies were statistically significant at the $p < .05$ level (confrontative, optimistic, supportant, and evasive). Only the partial correlations

between the coping strategies subscales confrontive, optimistic, and evasive, and resilience were significant.

To determine how well resilience is predicted by each set of coping strategies (courageous coping and defensive coping) as well as how well each set of variables predicts resilience over and above the other set, a multiple regression with two unordered sets of predictors was performed. The analysis of the first run evaluated how well resilience is predicted by courageous coping (set 1) and how well resilience is predicted by defensive coping (set 2) over and above courageous coping.

Table 14

*The Bivariate and Partial Correlations of the Predictors with Resilience Scale*

| Predictors | Correlations between each predictor and the resilience scale | Correlation between each predictor and the resilience scale controlling for all other predictors |
|---|---|---|
| Confrontive | .52** | .46** |
| Optimistic | .39** | .30* |
| Supportant | .25** | -.07 |
| Evasive | -.31* | -.37* |
| Emotive | -.12 | -.00 |

* $p < .05$, ** $p < .01$

The regression equation with the courageous coping measures was significant, $R^2 = .30$, adjusted $R^2 = .26$, $F$ (3, 62) = 8.80, $p = .000$. Defensive coping measures did significantly predict resilience over and above the courageous coping measures, $R^2$ change = .15, $F$ (2, 60) = 8.0, $p = .001$ (see Tables 15 and 16).

Table 15

*Multiple Regression Model Summary*

| | | | | | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the estimate | R Square Change | F change | df1 | df 2 | Sig F Change |
| 1 | .545[a] | .297 | .263 | 13.156 | .297 | 8.752 | 3 | 62 | .000 |
| 2 | .667[b] | .445 | .399 | 11.883 | .148 | 8.002 | 2 | 60 | .001 |

a. Predictors: (Constant), supportant, confrontive, optimistic
b. Predictors: (Constant), supportant, confrontive, optimistic, evasive, emotive

Table 16

*Multiple Regression Analysis I*

| Anova[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 4544.593 | 3 | 1514.864 | 8.752 | .000[b] |
| | Residual | 10731.771 | 62 | 173.093 | | |
| | Total | 15276.364 | 65 | | | |
| 2 | Regression | 6804.391 | 5 | 1360.878 | 9.638 | .000[c] |
| | Residual | 8471.973 | 60 | 141.200 | | |
| | Total | 15276.364 | 65 | | | |

a. Dependent Variable: RT
b. Predictors: (Constant), supportant, confrontive, optimistic
c. Predictors: (Constant), supportant, confrontive, optimistic, evasive, emotive

The analysis of the second run evaluated how well resilience is predicted by defensive coping (set 1) and how well resilience is predicted by courageous coping (set 2) over and above defensive coping measures. The relationship between defensive coping measures and resilience was also significant, $R^2 = .11$, adjusted $R^2 = .08$, $F\ (2, 63) = 3.74$, $p < .05$. Courageous coping measures did significantly predict over and above the defensive coping measures, $R^2$ change $= .34$, $F\ (3, 60) = 12.2$, $p < .001$. Based on these results, both courageous coping and defensive coping measures add additional predictive powers to resilience beyond what is contributed by each set individually (see Tables 17 and 18).

Table 17

*Multiple Regression Model Summary II*

| | | | | | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .362[a] | .106 | .078 | 14.732 | .106 | 3.738 | 2 | 63 | .029 |
| 2 | .667[b] | .445 | .399 | 11.883 | .339 | 12.238 | 3 | 60 | .000 |

a. Predictors: (Constant), emotive, evasive
b. Predictors: (Constant), emotive, evasive, confrontive, supportant, optimistic

Table 18

*Multiple Regression Analysis II*

| Anova[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Sum of Squared | df | Mean Square | F | Sig. |
| 1 | Regression | 1620.573 | 2 | 810.287 | 3.738 | .029[b] |
| | Residual | 13655.791 | 63 | 216.759 | | |
| | Total | 15276.364 | 65 | | | |
| 2 | Regression | 6804.391 | 5 | 1360.878 | 9.638 | .000[c] |
| | Residual | 8471.973 | 60 | 141.200 | | |
| | Total | 15276.364 | 65 | | | |

a. Dependent Variable: RT
b. Predictors: (Constant), emotive, evasive
c. Predictors: (Constant), emotive, evasive, confrontive, supportant, optimistic

To determine the relationship between defensive coping and resilience, partialling out the effects of courageous coping, partial correlation cofficients ($r_p$) were computed. A *p* valued of less than .05 was required for significance. The bivariate correlations between defensive coping and resilience ($r$ = -.29), and courageous coping and resilience ($r$ = .50) were significant. The partial correlation coefficient for defensive coping and resilience ($r_p$ = -.44) was also significant. The partial correlation (an effect size index) indicates an increase in the strength of the negative correlation

between defensive coping and resilience when compared with the zero order Pearson correlation ($r$ = -.29, $r_p$ = -.44). It appears that courageous coping acts as a moderating variable minimizing the negative effects of defensive coping on resilience (see Table 19).

Table 19

*Partial Correlations I*

| Control Variables | | | defensive | RT | courageous |
|---|---|---|---|---|---|
| -none-[a] | defensive | Correlations | 1.000 | -.289 | .169 |
| | | Significance (2-tailed) | . | .019 | .175 |
| | | df | 0 | 64 | 64 |
| | RT | Correlation | -.289 | 1.000 | .502 |
| | | Significance (2-tailed) | .019 | . | .000 |
| | | df | 64 | 0 | 64 |
| | Courageous | Correlations | .169 | .502 | 1.000 |
| | | Significance (2-tailed) | .175 | .000 | . |
| | | df | 64 | 64 | 0 |
| courageous | defensive | Correlations | 1.000 | -.438 | |
| | | Significance (2-tailed) | . | .000 | |
| | | df | 0 | 63 | |
| | RT | Correlations | -.438 | 1.000 | |
| | | Significance (2-tailed) | .000 | . | |
| | | df | 63 | 0 | |

a. Cells contain zero-order (Pearson) correlations

Partial correlation analysis was also done to determine the relationship between courageous coping and resilience partialling out the effects of defensive coping. A small positive increase in effect size was documented ($r$ = .50, $r_p$ = .58, $p$ < .05). Although defensive coping appears to moderate the effects courageous coping has on resilience, this effect appears very small (see Table 20).

Table 20

*Partial Correlations II*

| Control Variables | | | courageous | RT | defensive |
|---|---|---|---|---|---|
| -none-[a] | courageous | Correlations | 1.000 | .502 | .169 |
| | | Significance (2-tailed) | . | .000 | .175 |
| | | df | 0 | 64 | 64 |
| | RT | Correlation | .502 | 1.000 | -.289 |
| | | Significance (2-tailed) | .000 | . | .019 |
| | | df | 64 | 0 | 64 |
| | defensive | Correlations | .169 | -.289 | 1.000 |
| | | Significance (2-tailed) | .175 | .019 | . |
| | | df | 64 | 64 | 0 |
| defensive | courageous | Correlations | 1.000 | .584 | |
| | | Significance (2-tailed) | . | .000 | |
| | | df | 0 | 63 | |
| | RT | Correlations | .584 | 1.000 | |
| | | Significance (2-tailed) | .000 | . | |
| | | df | 63 | 0 | |

a. Cells contain zero-order (Pearson) correlations

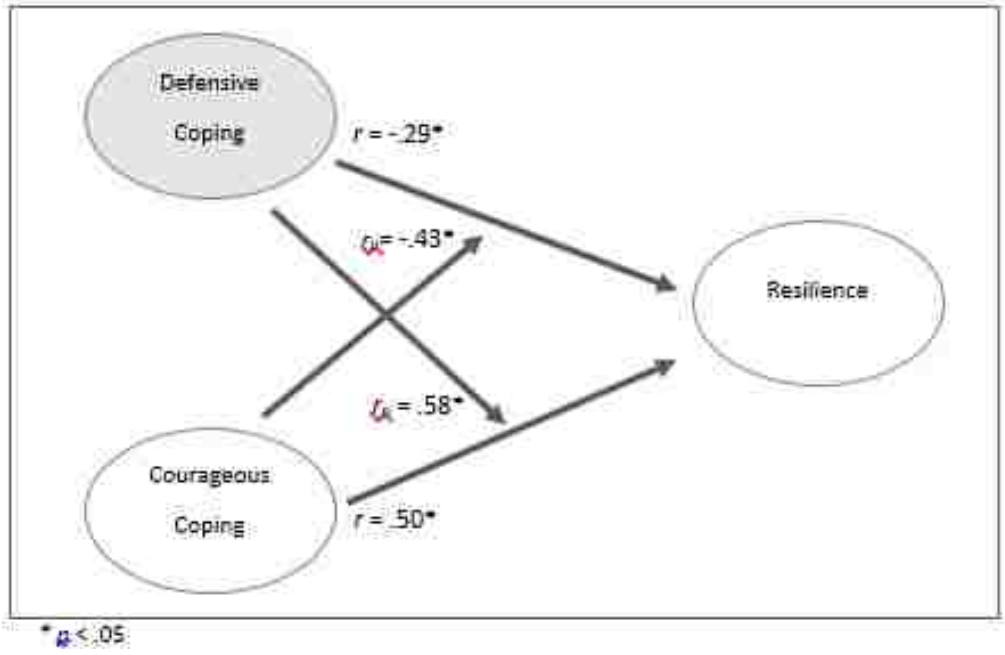


Figure 4. Study Model

**Summary**

The overall purpose of this study was to explore the relationships between and among the variables courageous coping, defensive coping, and resilience in the adolescent and young adult with type 1 diabetes, between the ages of 18-30, with a minimum duration of one year. Participants in this study consisted largely of white (91%), educated (91%) females (79%). Relationships between key demographic factors and the main study variables (courageous coping, defensive coping, and resilience) were examined. Using descriptive statistics (*M*, *SD*), and Analysis of Variance, a significant difference between females and males in the use of courageous coping strategies was found with female participants mean scores higher than their male counterparts. No significant differences were found between gender and defensive coping strategies and resilience scale scores. There were no significant differences found between each of the age categories and courageous coping, defensive coping and resilience scale scores.

Bivariate linear regression (Pearson *r* correlation) was used to predict resilience from HbA1c values. A significant small negative correlation was found such that as HbA1c values rise, resilience decreases. A Spearman's *rho* correlation coefficient was used to examine the relations between age and resilience and gender and resilience. Both were not significant.

Pearson correlations among the main study variables were conducted. Bivariate correlations within the main study variables found six statistically significant relationships at the $p < .003$ level when using a Bonferroni correction to rule out a type

1 error. A moderately positive correlation was found between each of the courageous coping subscales (confrontive, optimistic, and supportant). A moderately strong positive correlation was found between the defensive coping subscales (evasive and emotive). A strong positive correlation was found between confrontive subscale and the resilience scale with a moderately strong positive correlation between optimistic subscale and the resilience scale.

A multiple regression analysis with one set of predictors was conducted to examine how accurately resilience was predicted from a linear combination of the five coping subscales. This linear combination of coping strategies was significant at the $p < .05$ level. The sample multiple correlation coefficient of .67 indicates that approximately 45% of the variance of the resilience scale in the sample can be accounted for by the linear combination of the coping subscales. Correlations between each of the coping subscales and resilience (zero order correlations, see Table 15) showed the subscales confrontive (.52), optimistic (.39), and supportant (.25) to be significantly positively correlated at the $p < .05$ level. Only, the evasive subscale (-.31) was significantly negatively correlated with resilience at the $p < .05$ level). Partial correlations for confrontive (.46), optimistic (.30), and evasive (-.37) subscales were significant at the $p < .05$.

A multiple regression analysis for two unordered sets of predictors (courageous coping and defensive coping) to predict resilience was performed. Both regression equations were significant at the $p < .05$. Both courageous coping and defensive coping strategies were shown to add additional predictive power over and above the other

when predicting resilience. Partial correlation analysis showed that both courageous coping and defensive coping strategies act to moderate the effects of the other on resilience.

# Chapter V
# DISCUSSION OF FINDINGS

## Introduction

The purpose of this descriptive, correlational study was to examine the relationships among and between coping strategies identified as courageous coping and defensive coping, and resilience in the adolescent and young adults between 18-30 years of age with type 1 diabetes. This chapter will discuss the study's findings in relationship to the empirical literature and the Resilience in Illness Model. Limitations and strengths of this study will also be discussed.

## Study Sample

Adolescents and young adults (AYA) for purposes of this study, were identified as individuals between the ages of 18-30. Other key terms used by researchers to identify this group have included young adults and emerging adults. Eighteen year olds have often been included in children and adolescent studies (Hema, Roper, Nehring, Call, Mandleco, & Dyches, 2009; Yi-Frazier et al., 2015). The range of ages identified by these groups often varies. Examining psychological resilience in younger and older adults, Gooding, Hurst, Johnson, and Tarrier (2012) identified young adults as individuals between the ages of 18-25. Serrabulho, Gaspar de Matos, Nabais, and Raposo (2014) in the study of lifestyle and health behaviors of young adults with type 1 diabetes, identified young adults to be between the ages of 18-35. McGrady, Peugh, and Hood (2014) identified adolescents and young adults to

be 15-20 years of age. Often the AYA age group is incorporated in a much larger group identified as adults. Sultan, Epel, Sachon, Vaillant, and Hartemann-Heurtier (2008) studied coping, anxiety, and glycemic control in type 1 diabetics between the ages of 18-65. Therefore, the sample in this study is defined as "adolescents and young adults" to be sure it includes participants from the age of 18-30.

The time period from late adolescent into the thirties has been identified as a significant transitional period (Arnett, 2000, 2007; Hanna, 2012; Hanna, Weaver, Slaven, Fortenberry, & DeMeglio, 2014; Rasmussen, Ward, Jenkins, King, & Dunning, 2011). For many, it is a time where the individual is graduating from high school, becoming independent, moving away from home, and becoming almost completely responsible for not only her/his diabetes care but also the daily management of her/his diabetes. Many AYA are transitioning from pediatric care to full adulthood responsibilities (Serrabulho et al., 2014). According to Rasmussen et al, transitions are peak times for change causing an increase in stress and affecting coping behavior and problem solving. This transitional period affects the AYA in specific ways. Many AYA are becoming independent for the first time, having to make decisions regarding drinking, dealing with illness, and how it may affect their education. Peer relationships may be difficult or stressed as the AYA must decide whether or not to share his or her diabetes experience with friends and partners. Entering the work force, marriage, and becoming parents while managing their diabetes are all significant factors in this transitional periods (Rasmussen et al., 2011).

Various diabetes organizations have identified adolescents and young adults with type 1 diabetes as an underserved population within the diabetes community in need of support and research. The population for this study was obtained through various organizations which targeted adolescents and young adults with type 1 diabetes. Recruitment was done through the social network sites, coordinating Facebook pages, or via a paper survey distributed at the various events (JDRF One Walks, and TypeOneNation Summit). The population for this study ($N = 66$) reflects the demographics attributed to the AYA as described in the empirical literature as well as those organizations from which they were recruited. Female participants made up 78.8% of the sample. Females have often made up a greater proportion of study samples (Hanna et al., 2014; Hema et al., 2009; Jaser & White, 2011; Rasmusen et al., 2011; Wiley, Westbrook, Long, Greenfield, Day, & Braithwaite, 2015). All participants were between the ages of 18-30 and were identified as one transitional group (AYA). To test my hypothesis that this age group was one transitional group, individuals were grouped into age categories, 1 for 18-19 year olds, 2 for 20-24 year olds, and 3 for 25-30 year olds in order to examine the mean difference between the three age groups and the courageous coping scores, defensive coping scores, and resilience scale scores. Although differences were noted, with 18-19 year olds scoring higher on both courageous coping and defensive coping scores and 25-30 year olds scoring higher overall on resilience scale scores, none of these differences were significant at $p < .05$ when analyzed using ANOVA testing. Coping strategies and resilience scale scores were not significantly different between age

groups in this study thus supporting the researcher studying this as one transitional group. This sample was predominately white (91 %,) and highly educated (91% ranging from some college to graduate degree). Eighty two percent of the sample self-identified as being single, with 56% stating they either lived alone or with friends. Eighteen percent identified as living with a spouse or significant other. This would be expected since college diabetes and student diabetes organizations were among the sites from which the population was recruited. Thirty two percent identified as full time students with 46% responding that they were employed full time.

All participants had been diagnosed with type 1 diabetes for at least one year and 85% reported a duration of greater than five years. The mean age at diagnosis was 10.9 years (*SD* = 5.5). Although the range of HbA1c values was wide (4.9 -10.3) this sample's diabetes was relatively well controlled with a mean value of 7.3 (*SD* = 1.07). Forty five percent of participants reported hypoglycemic events at least 2-3 times per week with 74% experiencing hyperglycemic events greater than 3 times per week. Although glycemic control was not the focus of this study, HbA1c values and hypo/hyperglycemic events reflect the continuous struggle the AYAs have in maintaining optimal glycemic control. Whether or not glycemic control affects one's resilience or quality of life remains in question. Although HbA1c values were found to be significantly negatively related to resilience ($p < .05$), the correlation was small (-.28), accounting for only 8% of the variance of the resilience scale. One would expect that as HbA1c values increase (representing improper glycemic control)

resilience and/or quality of life would be diminished. Quality of life, and metabolic control have been identified as indicators of resilience by some researchers (Jaser & White, 2010). According to Hanna et al. (2014), it is not clear that glycemic control is associated independently with the quality of life of type 1 diabetics. Studying 17-18 year olds with type 1 diabetes for at least one year, a period of one year post high school graduation, Hanna et al. found that the demands and burdens of maintaining glycemic control did not support lower diabetes quality of life. They also found that although glycemic control was poor overall, participants did not express greater worries or less satisfaction with the quality of life as related to their diabetes.

It remains unclear how glycemic control is associated with resilience. This study supports a small positive correlation between better glycemic control, as identified by lower HbA1c values, and resilience. Further research is needed to understand the impact that illness related distress has on coping and resilience in the AYA with type 1 diabetes.

**Coping**

Researchers studying coping have identified specific coping behaviors and have attempted to place these behaviors in higher order categories. According to Skinner et al. (2003), lower order categories include behaviors such as problem solving, strategizing, and planning. These behaviors bring about a desired outcome whereas higher order coping strategies such as problem focused vs emotional focused coping are identified as basic adaptive processes which mediate between stress and some psychological outcomes (Skinner et al., 2003). The Resilience in Illness Model

(Haase et al., 2014) is the theoretical framework which has guided this research. Within this model, coping strategies where identified as two distinct variables. Protective, positive coping strategies (courageous coping) enhance resilience while negative coping strategies (defensive coping) would minimize resilience. Courageous coping was measured using the three subscales of the Jalowiec Coping Scale (confrontive, supportant, and optimistis). Confrontive coping was described as constructive problem solving with the individual willing to face up to and confront the problem or situation at hand.

To assess the degree to which the coping subscales were linear-related in this study, Pearson correlation coefficients were computed among the five coping subscales and the resilience scale. Using a *p* value of less than .003 (using Bonferroni approach to control for type 1 error) confrontive, optimistic, and supportant coping were moderately correlated at values ranging from .43 to .48. Cronbach's alpha for this study for courageous coping was .85 with the subscales confrontive, optimistic, and supportant ranging from .68 to .78. These values are consistent with the Jalowiec coping scale with confrontive, optimistic, and supportant subscales ranging from (.63-.81). Likewise, defensive coping subscales evasive and emotive were strongly correlated at .63. Cronbach's alpha for defensive coping was acceptable at .85 with each subscale ranging from .51-.83. The lower value for emotive coping was expected and retained due to theoretically derived meaning of defensive coping as operationalized by Haase et al., 2014. Evasive and emotive subscales from the Jalowiec coping scales were .78 and .63 respectively. Cronbach's alphas for both

courageous coping and defensive coping as established by this researcher, adds additional support to the internal consistency of these measures as operationally defined within Haase et al.'s (2014) Resilience in Illness Model.

For this study, the problem or situation the participant was asked to confront was his or hers type 1 diabetes. Items in the confrontive subscale asked the participant to respond to statements such as how often they "thought out different ways to handle the situation, or "tried to look at the problem objectively and from all sides". Optimistic coping reflected the participant's use of a positive attitude related to his or her type 1 diabetes. Such items identified as optimistic coping included "tried to see the good side of the situation" and "tried to think positively". The participant using supportant coping strategies would seek out support systems to cope, such as speaking to personal friends or family, professional health care providers, and spiritual leaders. Items which reflected supportant coping included statements such as "talked the problem over with family or friends" and "Prayed or put your trust in God". The Jalowiec subscales, evasive and emotive operationally defined defensive coping. The evasive coping strategies were actions taken to avoid dealing with their T1D. Items in this category included "tried to get away from the problem for a while" and "put off facing the problem". Emotive coping strategies were actions the individual used to express or release emotions to try to relieve stress. Items reflecting emotive coping included "worried about the problem" and "got mad and let off steam" (Jalowice, 2011).

Overall, female participants scored higher on all Jalowiec coping subscales. Using ANOVA analysis, only courageous coping strategies were significantly different between female participants and their male counterparts ($F$ (1, 64) = 11.98, $p$ = .001, $\eta^2$ = .16). Female AYAs in this study used more constructive problem solving, maintained more positive attitudes, and used more support systems to cope with their diabetes than did males. Although researchers have studied coping in children and adolescents with T1D (Hema et al., 2009; Jaser & White, 2011; Luyckx et al., 2010), few researchers have studied coping in the AYA between the ages of 18-30. There are limited studies which have identified gender differences in higher order coping strategies or styles such as problem focused coping versus emotion focused coping (Lazarus & Folkman, 1984). Jaser and White (2011) found 10-16 year old girls used more primary controlled coping than did boys in this age group. Primary controlled coping included coping behaviors identified as problem solving, emotional modulation, and emotional expression. Martin et al., (2013) examined the relationships between gender and coping strategies, and cardiovascular risk in 18-55 year olds ($M$ = 21.3) from a psychology class in a major southwestern University and found men, used significantly higher avoidant coping strategies overall, which included behaviors such as self-blame and substance use. Luyck, Vanhalst et al., (2010) examining the structure of illness coping in type 1 diabetes between the ages of 18 to 30, found male participants use significantly more active integrated coping (active coping with the challenges and problems associate with illness and accepted illness as self) than females who used more passive avoidant behaviors in dealing

with their illness. Coping strategies used by individuals based on gender vary from study to study. In this current study, female participants between the ages of 18-30 used more courageous coping strategies than their male counter parts when dealing with their type 1 diabetes.

**Resilience**

The Resilience in Illness Model (Haase et al., 2014) is a resilience model that was developed and studied primarily in adolescents and young adults with cancer. Coping strategies identified as positive and protective (courageous coping) were positively correlated with resilience in their study population whereas negative coping strategies (defensive coping) were negatively correlated.

To assess whether the relationship between courageous coping and defensive coping strategies, and resilience found in cancer patients would pertain to the AYA with T1D, a multiple regression analysis was conducted. First a multiple regression analysis was done with one set of predictors (comprised of all five coping subscales). The regression equation with all five subscales as predictors of resilience was significantly related at the $p < .05$ level with 45% of the variance of resilience explained by the linear combination of the five subscales. As expected, confrontive, optimistic, and supportant subscales were positively correlated (.52, .39, .25 respectively) to resilience at the $p < .05$. Although the subscales evasive and emotive were expected to be negatively correlated (- .31, -.12 respectively) to resilience, only evasive coping was significantly correlated. Correlation coefficients or their squares, measure the degree to which individual differences (variance) on one variable

corresponds to the individual differences on another (Licht, 2009). They do not identify independent contributions but rather ignores them (Licht, 2009). Partial correlation coefficients are correlations between a specific predictor and criterion when all other predictors in the study are controlled for (Green & Salkind, 2003; Licht, 2009). Partial correlations between the coping strategies subscales confrontive (.46), optimistic (.30), evasive (- .37), and resilience were significant at the $p < .05$ level. Although it is tempting to conclude that these subscales have a larger impact on resilience independently, Licht (2009) cautions that care is required in generalizing these interpretations. Reverse causation, a third variable influence not included in the study, and sample variance may be reasons for caution. In this study, the relative importance of the partial correlations for these coping scales is difficult because coping subscales were correlated. Confrontive, optimistic, and supportant subscales are all moderately correlated (.43- .48) and evasive coping and emotive coping are strongly correlated (.64). Haase et al. (2014), in the development of the Resilience in Illness Model, identified pathways to resilience where defensive coping acts as a mediating variable between illness distress (symptom distress and uncertainty in illness) and courageous coping to enhance resilience. To fully understand the impact the subscales confrontive, optimistic, and evasive have on resilience, further research is needed to understand the relationship between illness-related distress and coping.

To evaluate how well each set of coping strategies (courageous coping and defensive coping) predicted resilience, a multiple regression analysis with two unordered sets of predictors was conducted. The relationship between courageous

coping and resilience, and the association between defensive coping and resilience were both significant at the $p < .05$ level. Each set of coping strategies added significant predictive power over the other in predicting resilience. It appears that both courageous coping and defensive coping play significant roles in promoting resilience in the study sample. This study supports the relationships found by Haase et al. (20014) between coping strategies and resilience in AYA with cancer.

**Limitations**

Limitations to this study have been identified. The sample for this study was a sample of convenience. Often used in nursing research, this approach provides an accessibility to populations and topics that cannot be easily examined through probability testing (Burns & Grove, 2009). It allows the researcher to seek out individuals with certain characteristics such as T1D. Convenience sampling is subject to bias and has the potential to identify an atypical population (Polit & Beck, 2008). Participants recruited via diabetes organization social networking sites and completing the study online, self-selected to participate. Participants completing paper and pencil surveys did so after being approached by the researcher at diabetes organizational functions. This approach resulted in a homogenous population of predominantly white, educated, females with T1D between the ages of 18-30. As a result, portions of the population such as males and those with a more diverse ethnic background, have been under represented. Gathering data from a self-report survey may raise questions about the accuracy of the information received by the participant

as there is no sure way to ascertain that what one states is indeed true (Polit & Beck, 2008).

As a cross sectional study, correlations between coping strategies and resilience may not hold true across time (Haase et al., 2014). To understand the effects of time, as well as the impact illness related distress have on coping strategies and resilience, more intrapersonal longitudinal studies are needed (Lazarus, 2003).

**Strengths**

The Jalowiec Coping Scale and the Resilience in Illness Scale used to measure coping and resilience have shown strong validity and reliability in prior research and were found to be reliable instruments in measuring coping and resilience in this study. Courageous coping and defensive coping were each reported with acceptable Cronbach's alphas of .85.

Limited studies exist which examine the relationships between coping strategies and resilience in the AYA between the ages 18-30 with T1D. This study adds to the body of knowledge on how this transitional group copes with T1D and the impact coping may have on resilience.

**Conclusion**

Resilience is a process by which an individual learns to handle adversity head on in order to mitigate and overcome the effects of the adversity (Wagnild, 2009). Resilience is important for both mental and physical health by protecting against

depression, anxiety, fear, and helplessness. According to Wagnild (2009), resilient people are self-confident and know their strengths and weaknesses. They do not feel pressure to conform, can go it alone if necessary, and take pleasure in being different. They persevere. Less Resilient people tend to have greater problems with psychological disorders such as anxiety and depression. Resilience has been positively correlated with optimism, effective coping, and life satisfaction (Wagnild, 2009).

Due to the nature of their illness, AYA with T1D continue to struggle with the stresses and challenges associated with diabetes care and management during a time when they are becoming more independent, moving away from home, going to school, entering the work force, and establishing new relationships (Fredette, Mawn, Hood, & Fain, 2016; Hanna et al., 2014). A phenomenological qualitative study done by Fredette et al. examined the quality of life among college students living with T1D between the ages of 18-24. They found that planning ahead, thinking positive, and seeking support lead to an increase in quality of living expressed as happiness and an increase in a feeling of well-being.

The Resilience in Illness Model (Haase et al., 2014) has identified two coping variables which play either a significant role in promoting resilience (courageous coping) or have the ability to pose a risk to resilience. To date, no studies have examined coping strategies operationalized within a resilience model and which also measures resilience directly, in the AYA with T1D between the ages of 18-30. This study was the first to do so and results show that courageous coping strategies, coping

behaviors, which maintain positive attitudes, use constructive problem solving, and use support systems to cope, are significantly positively correlated with resilience in AYA with T1D. Likewise, defensive coping strategies, strategies which allow the AYA to avoid dealing with the problems associated with diabetes, or behaviors which lead to expressing or releasing emotions to relieve stress associated with diabetes, have a significantly negative correlation with resilience. Both courageous coping and defensive coping act to modify the effects of the other in the promotion of resilience. Haase et al. (2014) identified defensive coping as a mediating variable between illness-related distress, a variable not examined in this study, and courageous coping and resilience. Further research is needed to understand the role of defensive coping as a protective factor.

# Chapter VI

# SUMMARY, IMPLICATIONS, CONCLUSIONS

## Introduction

The purpose of this study was to explore the relationships between and among courageous coping strategies, defensive coping strategies, and resilience in adolescents and young adults with type 1 diabetes between the ages of 18-30. Statistically significant associations were found between the main study variables courageous coping, defensive coping, and resilience. This chapter provides a summary of the research findings and discusses the implications for nursing practice and future nursing research.

## Summary

This correlational descriptive study used both an online and a paper survey to gather data needed to explore the relationships between courageous coping, defensive coping, and resilience in the AYA with type 1 diabetes. A convenience sample was obtained via online recruiting from diabetes organizations face book pages (College Diabetes Network, Students with Diabetes, Young Adults with Diabetes, and Adults living with Diabetes) and forum page (Diabetes Daily). Paper surveys were completed upon request from the researcher at diabetes organizational events (JDRF One Walk Events, TypeOne Nation Summit, and JDRF Young Leadership Committee meeting). A total of 91 participants responded. The final sample ($N$ = 66) was comprised largely of white (91%), educated (91%), females (79%). All

participants were between the ages of 18-30. Online participants were asked to identify age by category. Participants completing paper surveys were placed by the researcher into the age categories. Eighteen percent identified age as 18-19, with 42% identifying age as 20-24, and another 39% identifying age as 25-30.

Participants completed a demographic information form, the Jalowiec Coping Scale, and the Resilience Scale. All instruments in this sample were found reliable. Cronbach's alpha reliability coefficients for courageous coping, defensive coping, and resilience ranged from .85- .89). Courageous coping, comprised of the Jalowiec subscales confrontive, optimistic, and supportant, was used to assess positive, protective coping strategies. Statistical analysis resulted in a sample mean of 48.1(*SD* = 10.1). Female participants (*M* = 52.0, *SD* = 8.4) scored significantly higher on the use of courageous coping strategies than did males (*M* = 40.4, *SD* = 12.3) at the $p < .05$ level. Based on the Partial Eta Square of .16, this was identified as a moderate relationship between gender and courageous coping. Defensive coping strategies (*M* = 21.8, *SD* = 8.7), compromised of the Jalowiec subscales evasive and emotive, and the Resilience Scale (*M* = 144.6, *SD* = 15.3) showed no significant differences in their mean scores based on gender. For this sample, there were no significant differences found between each of the three age groups (18-19, 20-24 and 25-30) and courageous coping, defensive coping or resilience.

Significant relationships were found among the main study variables. Moderate correlations were found between the Courageous coping subscales confrontive, optimistic, and supportant with *r* values ranging from .43- .48 ($p < .003$).

Defensive coping subscales, evasive and emotive, were strongly correlated with an *r* value of .63 ($p < .003$). A linear combination of all five coping strategies was conducted to evaluate how well this combination predicted resilience. The regression equation model was significant ($F$ (5, 60) = 9.64, $p < .05$). Forty five percent of the variance in resilience was explained by the linear combination of these subscales. Subscales confrontive (.52), optimistic (.39) and supportant (.25) were significantly positively correlated with resilience at the $p < .05$. Only the evasive subscale (- .31) was significantly negatively correlated with resilience at the $p < .05$.

A multiple regression analysis of two unordered sets (courageous coping and defensive coping) was performed to determine how well resilience was predicted by each variable set as well as how well each set predicted resilience over and above the other. Both regression equations were significant at $p < .05$ ($F$ (3, 62) = 8.80; $F$ (2, 63) = 3.74). Both courageous coping and defensive coping strategies ere shown to add additional predictive power over and above the other in predicting resilience. Both courageous coping and defensive coping strategies are predictors of resilience. Partial correlational analysis showed, that both courageous coping and defensive coping act to modify the effects of the other in the promotion of resilience.

Selected demographic variables and resilience were also explored. Although HbA1c values were significantly negatively correlated with resilience at the $p < .05$, the correlation was small ($R$ = -.28) accounting for approximately 8% of the variance of the Resilience Scale score. No significant relationships were found between age and resilience or gender and resilience.

## Implications

**Implications for nursing research.** The Resilience in Illness Model (RIM) has identified factors which predict resilience. Positive protective factors which affect resilience in a positive way include courageous coping, social integration, family environment, and derived meaning. Defensive coping and illness-related distress have been identified as risk factors which have a negative effect on resilience (Haase, 2004; Haase et al., 2014). This study expands on the use of RIM since to date, the Resilience in Illness Model has been studied exclusively in adolescents and young adults with cancer (Haase et al., 2014).

It was the purpose of this study to explore two of the variables (courageous coping and defensive coping) developed within this model to gain a better understanding of how coping affects resilience in the AYA with T1D. As expected, courageous coping strategies had a significant positive correlation with resilience while defensive coping strategies had a significant negative correlation. Although this study adds to the body of knowledge in understanding how two variables (courageous coping and defensive coping) within the RIM interact to enhance resilience in this population, these variables do not exist in isolation, rather they are mediated and moderated by other factors. For example, defensive coping has been identified as both a risk factor, and a mediating factor between illness-related distress (risk) and courageous coping (Haase, 2004; Haase et al., 2014). More research is needed in understanding how defensive coping might also act as a protective factor under certain circumstances. Problem focused coping or direct action coping

(identified as confrontive coping within RIM), has been identified in the literature to result in better health outcomes, and in this study enhanced resilience. Emotional focused strategies may be preferred when problem focused coping is not possible (Worthington & Scherer, 2004). According to Worthingon and Scherer, self-soothing or avoidance helps regulate the emotional experience until positive coping strategies can be established.

Within RIM, both illness-related distress (symptom distress and the inability to make sense of illness-related events) and a spiritual perspective are significantly correlated to courageous coping in the AYA with cancer (Haase, 2004; Haase et al., 2014). A significant negative correlation was identified between illness-related distress and courageous coping. Spiritual perspective (a belief in a power greater than self) was positively correlated with courageous coping. Further research is needed to understand the relationships between illness-related distress, spiritual perspective, defensive coping, and courageous coping in the AYA with T1D. As a cross sectional study, this study only identifies the relationship between coping strategies and resilience overall. Longitudinal studies are needed to understand how coping strategies may change over time and how this may affect resilience.

This population was predominately white, female, and well educated. Further research is needed to affirm whether the findings of this study would hold true across a more diverse less educated AYA population.

**Nursing Implications.** Health related quality of life and psychological disease remains less than optimal in the AYA with T1D (Cameron et al., 2002).

Management of T1D must include strategies which not only promote optimal glycemic control but also strategies which promote resilience. Resilience is the process by which individuals learn to face the challenges and adversities associated with T1D in order to lessen the effects of this chronic illness, to enhance overall wellbeing, and to protect against psychological illness such as anxiety and depression (Wagnild, 2009). RIM provides a theoretical basis from which nursing interventions may be developed to enhance resilience (Haase, 2004).

This study has found that coping strategies play a significant role in enhancing an AYA individual's resilience in T1D. Nurses need to promote strategies which include constructive problem solving and the ability to confront problems associated with diabetes management and care whenever possible. Interventions should include strategies which foster positive attitudes and optimism. Nurses need to encourage their patients to use support systems both personal, professional, and spiritual as needed (Jalowiec, 2011). Nurses should also understand the role evasive and emotive coping strategies may play in either promoting or minimizing one's resilience. Expression or releasing of emotion to minimize stress or behaviors which help the individual avoid the problem at hand, may initially be helpful or protective. Over time, these strategies may have more of a negative effect on resilience if more positive strategies are not developed, but this needs further study

## Conclusion

Coping strategies play a significant role in enhancing resilience in AYA with type 1 diabetes. This study supports past research identifying active coping or problem focused coping, as coping strategies which are associated with positive adaptive outcomes such as enhanced resilience. Likewise, this study also supports past findings that emotion focused and evasive coping strategies are behaviors that lead to less than optimal outcomes (Graue et al., 2004; Jaser & White, 2010; Luychx, Seiffje-Krenke et al., 2010; Oban et al., 2010).

Adolescents and young adults between the ages of 18-30 have been identified by diabetes organizations such as the College Diabetes Network, Students with Diabetes, and the JDRF as an underserved population within the diabetes community in need of support and further research. Coping strategies alone are not the only factors which affect resilient outcomes. Identified as a positive health concept and an interactive process consisting of multiple variables, the Resilience in Illness Model provides a theoretical basis for the understanding how one may become resilient. Further research is needed to understand how other factors identified in this model, such as illness-related distress and spirituality, may affect courageous coping and defensive coping directly as well as the mediating or moderating role coping strategies play in the relationships between these factors and resilience.

The findings from this study add to the nursing's body of knowledge. The Resilience in Illness Model is a nursing model with limited application outside of the

populations of adolescents and young adults with cancer. RIM was the theoretical model which guided this research in a population of adolescents and young adults with type 1 diabetes. The results from this study reinforce the potential benefits the application of this model may have to the specific issues related to T1D (Nelson et al., 2004). The study findings further establish the reliability and support the validity of courageous coping and defensive coping as operationalized within the RIM, and the Resilience Scale.

More research is needed to understand whether the relationships found in this study between and among coping strategies and resilience hold true across a more diverse, less educated, male population. Methodologies used to recruit participants should also include ways to reach populations without access to computers and social networking sites, as well as for those who do not have the ability to attend diabetes organizational functions and events. Understanding the role coping strategies play in enhancing resilience is adolescents and young adults with T1D is a step toward a greater understanding of how to promote a better quality of life and minimize psychological morbidity in this population.

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APPENDIX A

 ID #_____

# Jalowiec Coping Scale

APPENDIX B

**Permission to Use the JCS**

Debra Messinger has permission to use the Jalowiec Coping Scale in her research study as we previously discussed, with online security protection for the JCS and limited access to the JCS only to the diabetic patients in her study.

Dr Anne Jalowiec, RN, PhD
Professor Emeritus, Loyola University of Chicago
Email: ajalowiec@yahoo.com

**From:** deb
**Sent:** Thursday, March 27, 2014 6:47 PM
**To:** ajalowiec@yahoo.com

Dear Dr. Jalowiec, I just wanted to get back to you regarding your concerns for online use of JCS. My plan is to purchase through SurveyMonkey a professional account which also allows me to purchase SSL encryption protection for the survey links, survey pages, and exports. SSL encryption is commonly used for online banking or sites that transmit secure information. It is also recommended by SuveyMonkey to meet HIPAA compliance. My plan is to recruit my population through an online diabetes newsletter and or support groups. Interested respondents would then be directed to a password protected URL address provided by Survey Monkey were they would complete the instruments. The survey would automatically shut down once my population has been met. I hope this helps alleviate any concerns you may have for online use of JCS. Sincerely, Debra Messinger

APPENDIX C

## The Resilience Scale (RS)

# APPENDIX D

## Permission to Use the RS

Hi Debra,
Thank you for asking. There are some rules for using the RS online with Survey Monkey and so I'm glad you wrote.

1. The RS can only be placed on a password protected website. It cannot be open to the public but only on a website with limited password protection.
2. The RS must be taken down immediately after the study collection is completed. I have had several just leave the RS up in the public domain for months and months and it's very difficult to get this taken down. You will need to agree to this.
3. The RS is a proprietary instrument and this work cannot be done for the purpose of making money or securing business for yourself using resilience. It is strictly for your research.

If you can agree to all of this, you are allowed to use the scale on Survey Monkey.

I also read in your email that you wanted permission to "format" the scale. You know of course that you cannot change anything (words, responses, numbering, and so forth) and do you mean to just place it online?

Thanks for reading through these important requirements and agreeing to them.

Sincerely,
Gail Wagnild, RN, PhD
Owner and CEO
Resilience Center
www.resiliencescale.com
Phone: 800.671.0259
Fax: 888.244.1964

**From:** Debra Messinger [mailto:dmess42@hotmail.com]
**Sent:** Monday, March 24, 2014 3:18 PM
**To:** gwagnild@resiliencecenter.com
**Subject:** Resilience Scale

Dear Dr. Wagnild, I received a license from you on June 21, 2013 to use your Resilience Scale for my dissertation research. As I move forward, I would like to format your scale for online use through the web based survey company Survey

Monkey. I will only be targeting diabetics between the ages of 18-24. Please let me know if there is any problem formatting your scale for online use. Sincerely, Debra Messinger (Seton Hall University Nursing PhD student)

APPENDIX E

**Demographic Information Form**

Please check all the information which applies. Please respond to all statements

| **Demographic Information Form** |
|---|
| Gender |
| □ Female □ Male |
| Marital Status: |
| □ Married □ Divorced<br>□ Single □ Widowed |
| Education: |
| □ Less than 8th grade □ Technical/vocational training □ Graduate degree<br>□ Less than 12th grade □ Completed some college<br>□ Completed high school □ Bachelor's degree |
| Living Situation: |
| □ Live alone □ Live with a spouse □ Other<br>□ Live with children □ Live with friends □ Live with spouse and children |
| Employment status: check all that apply |
| □ Full-time □ Unemployed □ Full-time student<br>□ Part-time □ Homemaker □ Part-time student |
| Ethnic Background |
| □ Caucasian □ African American □ Hispanic<br>□ Asian □ American Indian □ Other_____ |
| Age:_____ Years |
| Age when you were first diagnosed with type 1 diabetes:_____ |
| How long have you had type 1 diabetes? □ 1 year to 3years □ greater than 3 years |
| Have you been diagnosis with any other illness other than diabetes? □ yes □ No |
| How often do you experience episodes of low blood sugar (below your target level)? |
| □ 0-1time per week □ 2-3 times per week □ greater than 3 times per week |
| How often do you experience episodes of high blood sugar (above your target level)? |
| □ 0-1 time per week □ 2-3 times per week □ greater than 3 times per week |
| Most recent HbA1c: _____ |

# APPENDIX F

## Seton Hall University IRB Approval

**REQUEST FOR APPROVAL OF RESEARCH, DEMONSTRATION OR RELATED ACTIVITIES INVOLVING HUMAN SUBJECTS**

**All material must be typed.**

*PROJECT TITLE:* Resilience and Coping in the Adolescent and Young Adult with Type 1 Diabetes

*CERTIFICATION STATEMENT:*

In making **this application,** I(we) certify that I(we) have read and understand the University's policies and procedures governing research, development, and related activities involving human subjects. I (we) shall comply with the letter and spirit of those policies. I(we) further acknowledge my(our) obligation to (1) obtain written approval of significant deviations from the originally-approved protocol BEFORE making those deviations, and (2) report immediately all adverse effects of the study on the subjects to the Director of the Institutional Review Board, Seton Hall University, South Orange, NJ 07079.

[signature] 5/12/15
RESEARCHER(S) DATE

**Please print or type out names of **all** researchers below signature.
Use separate sheet of paper, if necessary.**

My signature indicates that I have reviewed the attached materials of my student advisee and consider them to meet IRB standards.

Marie Foley 5/13/15
RESEARCHER'S FACULTY ADVISOR [for student researchers only] DATE

**Please print or type out name below signature**

The request for approval submitted by the above researcher(s) was considered by the IRB for Research Involving Human Subjects Research at the May 2015 meeting.

The application was approved ✓ not approved ___ by the Committee. Special conditions were ___ were not ✓ set by the IRB. (Any special conditions are described on the reverse side.)

Mary T. Ruzzolla, Ph.D 5/27/15
DIRECTOR, DATE
SETON HALL UNIVERSITY INSTITUTIONAL
REVIEW BOARD FOR HUMAN SUBJECTS RESEARCH

Seton Hall University
3/2005

# APPENDIX G

## Permission for Use on Diabetes Daily

**From:** David Edelman
**Sent:** Wednesday, April 2, 2014 1:53 PM
**To:** deb

Hi Debra,

We can share your link on Diabetes Daily's Facebook page. I would write a compelling invitation that's just a short paragraph or two with a link to the signup form or survey and send it to me.

Warm Regards,
David

David Edelmany
President, Diabetes Daily
www.DiabetesDaily.com

p (216) 867-1178
f (216) 937-0194
e david@diabetesdaily.com

facebook.com/diabetesdaily
twitter.com/diabetesdaily
youtube.com/diabetesdaily

*Shop Amazon.com Smile and .5% of your purchase will support HFLA. We've been helping families in need with interest-free loans for 110 years!*

On April 2, 2014 at 1:48:11 PM, Debra Messinger (dmess42@hotmail.com) wrote:

Sent from Surface
Dear Team at diabetes daily, I am a PhD student from Seton Hall University School of Nursing looking to conduct a research study targeting 18-24year olds with type one diabetes. I am hoping to recruit my population through an online support network. Is it possible to recruit my population through your weekly newsletter? If so what is the procedure? I am new to online research and would welcome any suggestion you may have in reaching this population. I am looking for a population of approximately 150. Sincerely, Debra Messinger

# APPENDIX H

Whitfield, Delia Fri, Feb 5 12:44 PM
to Brady, John; Philip Brady; deb
cc Parsons, William (Bill); Ade, Alexandra

## RE: PhD study Type 1 diabetes

Hi Debra,

Thank you for your interest in the T1D community – your research sounds very worthwhile. I believe you may have recently gotten in touch with our Outreach Coordinator, Alex Ade(cc'd here), who manages the upcoming March 5th Summit. I know Alex and our team would welcome you to be there.

A few other ideas for generating participation in your survey:

Our Chapter has a very active Adults with T1D (AT1) Facebook group: https://www.facebook.com/groups/at1jdrfcapitolchapter/ with almost 400 members – that would be a great place to post your survey.

We also have a Young Leadership Committee (YLC) which is a volunteer-run group of young professionals (with a connection to T1D) in the DC Metro area that host fundraising events that benefit JDRF. If you're interested, you could email the group and ask them to share the survey with their listserv? The email address is: jdrf.ylc.greaterchesapeake@gmail.com and the Co Chairs of the committee are: Khristine Agnello, Leigh Mason and Katie Kidera.

I hope this is helpful. Best of luck with the study, and don't hesitate to contact me or Alex if you need anything else!

All the best,

Delia

**Delia Whitfield | Director, Signature Events**
**Greater Chesapeake and Potomac Chapter**
***Serving: DC, MD, and Northern VA***
e: dwhitfield@jdrf.org
o: 202.465.4117
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***DC Office:***
1400 K Street, NW Suite 725
Washington, DC 20005
***Maryland Office:***
825 Hammonds Ferry Road, Suite H

# APPENDIX I

## Invitation to Join a Research Study

Hi, my name is Debra Messinger and I am a PhD student at Seton Hall University School of Nursing. I would like to invite you to participate in a study of the relationships between coping skills and resilience in individuals with type 1 diabetes. Understanding how people cope with their diabetes, may help researchers understand how to help people become more resilient.

If you have been diagnosed with type 1 diabetes for at least one year and are between the ages of 18-24, I need your help to improve our knowledge of coping strategies associated with resilience and diabetic health. To participate in this study, just sign onto this URL (yet to be determined) where you well be asked to complete a 20-30 minute survey. All information is strictly confidential. Understanding the relationships between coping and resilience may help nurses assist diabetics like you move more positively through the challenge of having diabetes. While your parents might want to look over these questions, I am interested in *your* personal use of coping skills and resilience.

APPENDIX J

## Letter to Participants

**Researcher's affiliation:**

The researcher for this study is a doctoral candidate at Seton Hall University College of Nursing in South Orange, New Jersey. This study is in partial fulfillment of the requirements for a PhD in nursing degree.

**Purpose:**

The purpose of this study is to examine the relationships between coping strategies and resilience in adolescents and young adults with type 1 diabetes. Understanding the relationships between coping and resilience may help nurses assist diabetics like you move more positively through the challenges of having diabetes. This survey should take approximately 20 minutes to complete.

**Procedures:**

If you choose to participate, you will be asked to complete the following survey which includes the Demographic Information Form, the Jalowiec Coping Scale, and the Resilience Scale. You may discontinue your participation at any time.

**Instruments:**

The Demographic Information Form will ask some general questions about you such as your gender, education level, and living situation. The Jalowiec Coping Scale will ask you questions about ways in which you cope with your diabetes such as "Worried about the problem" and "Hoped that things would get better". The

Resilience Scale will ask you questions such as “I am determined” and “I usually manage one way or another”.

**Anonymity:**

Your participation is completely voluntary. All responses will be completely anonymous and no one will be able to identify you or your responses.

**Confidentiality:**

All data will be down loaded onto a flash drive and locked in a file cabinet in the researcher’s office. Only the researcher will have the key.

**Risks/Benefits:**

There are no anticipated risks to participating in this study. There are no direct benefits to participating in this study. Your responses will aid the researcher in understanding the relationship between coping strategies and resilience in adolescents and young adults with type 1 diabetes.

**Contact information:**

If you have any concerns or questions about this study, contact Debra Messinger, MS, RN, ANP at the PhD Nursing Program at the College of Nursing Seton Hall University, 973-761-9266 or by email at debra.messinger@student.shu.edu or the researcher’s faculty advisor: Marie Foley, PhD, RN at 973-761-9282 or by email at marie.foley@shu.edu. If you have further questions about the research or your rights as a research subject, you may contact the Seton Hall University Institutional Review Board Director, Dr. Mary Ruzicka at 973-313-6314 or by email at irb@shu.edu.

**Consent to participate:**

**“**Consent to participate is indicated by a completed questionnaire”