HEALTH-RELATED QUALITY OF LIFE IN CHRONICALLY-ILL COLLEGE STUDENTS: EXAMINING INFLUENTIAL CONSTRUCTS

Thesis
Submitted to
The College of Arts and Sciences of the UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirements
For The Degree
Master of Arts in Clinical Psychology

By
Morgan E. Longstreth, B.Sc.

UNIVERSITY OF DAYTON
Dayton, Ohio
December 2017
HEALTH-RELATED QUALITY OF LIFE IN CHRONICALLY-ILL COLLEGE STUDENTS: EXAMINING INFLUENTIAL CONSTRUCTS

Name: Longstreth, Morgan E.

APPROVED BY:

______________________________
Jacob M. Burmeister, Ph.D.
Faculty Advisor

______________________________
Catherine J. Lutz-Zois, Ph.D.
Committee Member

______________________________
Lee J. Dixon, Ph.D.
Committee Member

Concurrence:

______________________________
Lee J. Dixon, Ph.D.
Chair, Department of Psychology
ABSTRACT

HEALTH-RELATED QUALITY OF LIFE IN CHRONICALLY-ILL COLLEGE STUDENTS: EXAMINING INFLUENTIAL CONSTRUCTS

Name: Longstreth, Morgan E.
University of Dayton

Advisor: Dr. Jacob M. Burmeister

Individuals with chronic illness are prone to experiencing stigmatization associated with their illness (Ginsburg & Link, 1993); these individuals often utilize an avoidant coping style (Philips, 1987) and are vulnerable to poor social support. Existing literature describes how the chronically ill encounter these constructs, yet the impact of these factors on college students’ health-related quality of life and psychological functioning is not understood. Two studies tested the hypotheses that stigma, avoidant coping, and social functioning are associated with HRQoL and psychological well-being in undergraduate students who have chronic illness. Participants were undergraduates diagnosed with at least one chronic illness. Participants completed self-report measures online. In Study 1 (N = 140), stigma, avoidant coping, and social support significantly predicted diminished HRQoL, depression, and anxiety. Study 2 (N = 193) confirmed the results of Study 1, finding that stigma, avoidant coping, and social support significantly predict diminished HRQoL, depression, and anxiety; findings across both studies
supported hypotheses. Findings suggest that college students with chronic illness face significant challenges associated with and during their undergraduate career.
ACKNOWLEDGEMENTS

I wish to extend my most sincere and exhaustive gratitude to everyone who has helped me reach this point in my career. First, I want to thank Dr. Jacob Burmeister, the advisor of this thesis, for assisting me with all components of this thesis. Dr. Catherine Lutz-Zois, thank you for your wonderful editing throughout this thesis. Additionally, I would like to thank Dr. Lee Dixon for his advisory comments regarding the methodology of this study. This project would not have been possible without the direction and support of the committee members.

Further, I would like to thank my support system, both in personal and professional capacities, for the encouragement they have provided me throughout this process. Thank you to everyone who has read, reviewed, and provided comments on this thesis; without such guidance, this document would not be in this form. I am continually grateful for all of the guidance and support I have received while completing this component of my academic journey.
# TABLE OF CONTENTS

ABSTRACT........................................................................................................ iv  
ACKNOWLEDGEMENTS.................................................................................. vi  
LIST OF TABLES................................................................................................ ix  
INTRODUCTION................................................................................................. 1  
STUDY 1  
   METHODS...................................................................................................... 18  
   RESULTS...................................................................................................... 27  
   DISCUSSION................................................................................................. 35  
STUDY 2  
   METHODS...................................................................................................... 44  
   RESULTS...................................................................................................... 53  
   DISCUSSION................................................................................................. 61  
GENERAL DISCUSSION................................................................................... 67  
REFERENCES................................................................................................... 78  
APPENDICES  
   A. Demographics Questionnaire for Participants Recruited on Campus  
      in Study 1................................................................................................. 87  
   B. Demographics Questionnaire for Participants Recruited Through mTurk  
      in Study 1................................................................................................. 90
C. Demographics Questionnaire for Participants in Study 2…………………………93

D. Battery of Measures Used in Both Studies…………………………………………..96
LIST OF TABLES

1. Study 1 Participant Demographics.................................................................21

2. Means, Standard Deviations, and Correlations Between Primary Study Variables
   in Study 1......................................................................................................28

3. Regression Analyses Predicting Health-Related Quality of Life (HRQoL)
   in Study 1......................................................................................................29

4. Regression Analyses Predicting Health-Related Quality of Life (HRQoL) from
   Stigma x Avoidant Coping Interaction in Study 1.........................................30

5. Regression Analyses Predicting Depression in Study 1.....................................31

6. Regression Analyses Predicting Depression from Stigma x Avoidant Coping
   Interaction in Study 1..................................................................................32

7. Regression Analyses Predicting Anxiety in Study 1.........................................34

8. Regression Analyses Predicting Anxiety from Stigma x Avoidant Coping
   Interaction in Study 1..................................................................................34

9. Study 2 Participant Demographics..................................................................47

10. Means, Standard Deviations, and Correlations between Primary Study Variables
    in Study 2....................................................................................................54

11. Regression Analyses Predicting Health-Related Quality of Life (HRQoL)
    in Study 2....................................................................................................55
12. Regression Analyses Predicting Health-Related Quality of Life (HRQoL) from Stigma x Avoidant Coping Interaction in Study 2……………………………….55

13. Regression Analyses Predicting Depression in Study 2………………………………..57

14. Regression Analyses Predicting Depression from Stigma x Avoidant Coping Interaction in Study 2………………………………………………………………………………….58

15. Regression Analyses Predicting Anxiety in Study 2……………………………………..59

16. Regression Analyses Predicting Anxiety from Stigma x Avoidant Coping Interaction in Study 2…………………………………………………………………………………………60
INTRODUCTION

College students face a multitude of challenges during their pursuit of higher education, including developing new relationships and meeting elevated scholastic expectations. Introducing chronic illness to the fragile equation of identity development, establishing mature relationships, and academic pressures that occurs in this population provides further impediment to such development. Though chronic illness is often associated with advanced age (Ornstein, Nietert, Jenkins, & Litvin, 2013), research suggests that undergraduate students may be targets of impact from such diseases, along with numerous other external challenges during this critical period of development (Patton, Renn, Guido, Quaye, & Forney, 2016). As such, the research proposed will examine how principle factors related to chronic illness, including illness-related stigma and avoidant means of coping, affect the HRQoL and psychological functioning of college students with chronic illnesses.

Chronic Illness

In terms of the research proposed, chronic illness is operationally defined as a health condition or disease that persists at least six months; these diseases are characterized by many contributing factors, often cannot be cured or require extensive treatments, and are frequently accompanied by an unpredictable prognosis (Haemmelmann & McClain, 2013). Due to this erratic nature, the course of chronic
illness can be unforgiving, with periods of remission and relapse. Relatedly, the symptoms of these illnesses may not be apparent to others; for example, for many chronic illnesses, like chronic pain, high blood pressure, or arthritis, symptoms are largely invisible to the outside observer, but may cause significant impairment in the patients themselves (Joachim & Acorn, 2000). In sum, chronic illness may be unnoticeable to others, but cause serious, unpredictable, or cyclical suffering to those afflicted.

Chronic illnesses are increasing in both prevalence and impact; projections suggest that chronic illness could increase by 1% per year over the next 30 years (Anderson & Horvath, 2004). Estimates of rates of chronic illness suggest that as many as half of all Americans suffer from a chronic condition; of this population, about one-fourth experienced at least two persisting illnesses (Ward, Schiller, & Goodman, 2014). Though estimates of chronic illnesses in this population are limited, some reports provide evidence that as many as one-third of all college students experience a chronic illness (Stewart-Brown, Evans, Patterson, Peterson, Doll, Balding, & Regis, 2000). Further, college students may engage in numerous behaviors that put one at higher risk for developing and exacerbating the symptoms of chronic illnesses, such as alcohol and drug use, poor nutrition, and deficient sleep patterns (Scott-Sheldon, Carey, & Carey, 2008). It is evident that, with numerous possible contributing factors, college students with chronic illnesses may be prone to poorer outcomes than their healthy peers.

Though research suggests the prevalence of chronic conditions is as high as one-third in the college student population (Ward, Schiller, & Goodman, 2014), there is limited research examining the specific mechanisms through which these illnesses affect the well-being of college students. Thus, in order to address a deficiency in both
understanding and the literature, the current study attempts to understand how chronically-ill college students cope with their symptoms, experience illness-related stigma, and how their health-related quality of life, psychological and social functioning is influenced by their chronic symptoms.

**Health-Related Quality of Life**

The majority of research examining the effects of chronic illnesses on college students has primarily focused on how these students overcome or work around their illnesses while trying to meet academic goals (Hammer, Werth, & Dunn, 2009; Houman & Stapley, 2013). While academic functioning in this population is widely assessed, health-related quality of life (HRQoL) is equally worthy of research and has arguably further reaching influence if better understood, as it extends into more realms of life than academic success. In terms of the research, HRQoL refers to how one’s disease status or symptoms impacts their everyday functioning, life satisfaction, and well-being (Devins, 2010). As such, HRQoL was selected as the primary construct of interest, as it examines one’s quality of life within the context of their current health status.

As HRQoL subsumes many realms of functioning, clearly defining quality of life entails numerous challenges. As Aaronson (1988) describes, the definition of quality of life should subsume more characteristics than one’s perceived satisfaction with their life; components like psychological and physical functioning also should be involved (Aaronson, 1988). While Aaronson’s statement is dated, it states an important consideration: inclusion of such criteria has special implications for those with chronic illness, as they are likely to experience greater impediments to these constructs because
of their symptoms. This further lends support to the hypothesis that HRQoL is impacted by chronic illness symptoms, and provides reasoning why such constructs should be investigated further.

As stated previously, the existing literature base on chronically-ill college students primarily focuses on how chronic symptoms affect the daily lives of college students, especially in reference to academic challenges and milestones. For example, research conducted by Hammer, Werth, & Dunn (2009) provides evidence that college students with chronic illness utilize different modes of study (e.g., in-person classes vs. online classes) than their healthy counterparts. Other researchers suggest special implications for academic advising, including broader awareness of the chronic illness course so as to better serve and understand the requirements of chronically ill students and thus better meet their academic needs (Houman & Stapley, 2013). Finally, some colleges have implemented academic support programs for their students with chronic illnesses, with results that suggest significant improvements in factors like GPA and retention rates (Royster & Marshall, 2008). It is understood that chronic illness diagnoses are related to significant academic impediments in college students; understanding how illnesses impact other realms of life could not only improve overall quality of life, but academic outcomes, as well.

Though little is understood about the HRQoL of college students with illnesses, some researchers have delved into the topic. For example, research conducted by Herts, Wallis, & Maslow (2014) provides evidence that college freshmen experiencing chronic illness experience significant impairment in health-related quality of life (HRQoL) in
comparison with their healthy peers. These students also reported higher levels of loneliness than their fellow students without a chronic illness (Herts, Wallis, & Maslow, 2014). Such results are suggestive of the crucial impact of chronic illnesses on the HRQoL of these undergraduate students.

To further complicate normative development, students afflicted with chronic illness must balance greater challenges than their healthy peers. As Aaronson (1988) describes, chronic illness interferes with many aspects of the individual’s quality of life; not only do they have to manage the symptoms of their illness, but the individual must also deal with everyday hassles and stressors unrelated to the disease course. Attesting to this, research conducted by van Houtum, Rijken, & Groenewegen’s (2015) suggested that everyday problems, like finances, relational issues, and employment, interfered with chronic symptom management. Those with fewer daily problems appeared more capable of managing their symptoms than those with a greater number of daily stressors (van Houtum, Rijken, & Groenewegen, 2015). Further, research conducted by Barakat & Wodka (2006) provided evidence that some college students with chronic illness reported symptoms of posttraumatic stress and subclinical levels of stress symptoms; such symptoms were implicated in negatively impacting the well-being and quality of life of these students (Barakat & Wodka, 2006). Such symptoms may ultimately put these students at further risk for negative mental health outcomes. Thus, college students, who likely face increased life demands as they transition into adulthood, may experience greater suffering from symptoms, face barriers to treatment adherence, and exhibit depleted psychological functioning.
By their nature, chronic illnesses often can alter one’s life course. As Bury states in his 1982 paper describing chronic illness as a biographical disruption, chronic illnesses completely change and disrupt the framework of everyday life for those affected. He cites three components to the disruption that chronic illness causes: (1) modification of normal boundaries and routines, (2) reconsideration of one’s self-concept and understanding, and (3) response to the illness, involving utilization of resources related to coping and responding to the disruption. Bury cites the uncertainty of chronic illness as being especially disruptive to the life of chronically ill patients. Quality of life is likely to wane under the pressures of not only management of chronic illness symptoms, but also the disruption and disturbance of the symptoms on one’s life.

Chronically ill individuals, as Bury (1982) described, must overcome constant disruptions to their routines and plans. Such suffering experienced by chronically ill individuals has been implicated in a “loss of the self”; this loss of self follows the disintegration of life plans formed prior to the experience of chronic symptoms (Charmaz, 1983). The self-image created before diagnosis or experiencing chronic symptoms is often shattered over the disease course; research conducted by Adams, Pill, & Jones (1997) suggested that coping ability and positive treatment outcomes are significantly linked to one’s ability to accept chronic illness as a part of their identity. As such, these patients must undergo transforming their life and living with many restrictions, and face possible social isolation, whether they isolate themselves or are outcast by others. Further, those with chronic illnesses may feel that they are a burden on those around them, and feel discredited because of their symptoms (Charmaz, 1983).
Such beliefs, impacted by coping skills and beliefs of others, lead to detriments in psychological health and social functioning.

Another way to conceptualize HRQoL is the extent to which one’s symptoms intrude on their daily functioning. In 2010, Devins proposed the Illness Intrusiveness Model, providing a theoretical framework for how chronic illness can impinge on one’s quality of life. Under this model, illness intrusiveness includes both the patient’s psychological well-being and how the chronic illness affects positive outcomes and one’s sense of personal control over their disease course. The framework Devins proposes describes how a disease and its treatment can have a bearing on one’s perceived well-being, and lends guidance to the proposed research in targeting factors that may contribute to decreases in treatment adherence and psychological well-being. Thus, illness intrusiveness is a core component of HRQoL.

**Mental Health**

Previous research has suggested that chronic illnesses often have a reciprocal and interdependent relationship with mental health (Katon, Lin, & Kroenke, 2007). Further, understanding the impact of both internal and external stimuli on one’s psychological health is essential when examining HRQoL. In a meta-analysis of studies examining depression and anxiety diagnoses comorbid with chronic illnesses, Katon, Lin, and Kroenke (2007) found that symptoms of major chronic illnesses were significantly associated with diagnoses of depression and anxiety; the meta-analysis also suggested a correlational relationship between depressive and somatic symptoms, such that as depressive symptoms decreased, so did somatic symptoms.
There is significant evidence suggesting that mental illnesses, such as depression and anxiety, may also serve as risk factors for developing chronic illnesses; poor mental health may also have the potential to lead to more negative disease outcomes (Clarke & Currie, 2009). In an analysis of psychological functioning of South African patients with chronic illness, researchers found that as many as one-third of patients reported anxiety, and one-fifth experienced symptoms of depression (Kagee, 2008). As the findings of each of these studies provide, the relationship between mental health and chronic illness symptoms is likely reciprocal.

Further, stigmatization of chronic illnesses has been found to be the single best predictor of poor mental health outcomes (Gupta, Gupta, & Watteel, 1998). In patients with an outwardly-obvious physical chronic illness (e.g., psoriasis), participants reported experiencing a high number of events where they were not touched by others; the participants with psoriasis that reported experiencing such events exhibited significantly greater levels of depression than participants with psoriasis who did not experience such an event. Such research provides support that chronic illnesses, especially those with outward physical symptoms, are related to greater incidence of perceived stigmatization; such stigmatization may ultimately be related to significantly poorer mental health outcomes, as well.

**Social Functioning**

The social behaviors of college students are of significant interest, as research suggests college students spend up to 12 hours per day engaging in social interaction with peers (Coccia & Darling, 2016). An individual’s ability to sustain social interactions has
a significant impact on their overall functioning; research has provided evidence that participation in social relationships can benefit overall health (Umberson & Montez, 2010). More specifically, evidence has been found that involvement in positive social interactions is related to improvements in mental and physical health, and a decreased risk of mortality. Negative or stressful social relationships may be associated with increased physiological arousal, thus leading to heightened heart rate and blood pressure, poor health behaviors like overeating or alcohol/substance abuse, and psychological distress such as depression and anxiety (Umberson & Montez, 2010). Such research suggests that social interactions may significantly contribute to health outcomes across the lifespan.

As Compas, Wagner, Slavin, & Vannatta (1986) suggest, the relationship between the psychological and social factors is likely reciprocal, meaning that as peer and social support declines, so does the psychological well-being of the individual (Compas, Wagner, Slavin, & Vannatta, 1986). Though these results do not directly reflect on chronic illness, what they suggest about the importance of peer support for a healthy student transitioning from high school to college is crucial. Simply, social support is fundamental for positive mental health for individuals without chronic illness; therefore, it may be even more important for those suffering from chronic illnesses, given what is known about the importance of healthy social support for these individuals (Compas, Wagner, Slavin, & Vannatta, 1986; Umberson & Montez, 2010).
**Stigma**

Fears and perceptions of stigmatization are unfortunately common in those afflicted with chronic illnesses (Crandall & Moriarty, 1995; Ginsburg & Link, 1993). Stigma is a negative or unfair belief or judgment about an individual based on a particular quality or circumstance of that person. As such, it is thought to be a critical influence on the psychological functioning of college students.

Understanding the evolutionary origins of stigmatization can provide deeper insight into how and why it occurs. As Kurzban & Leary (2001) comment, stigmatization of others is functional in that it protects individuals from poor social counterparts who may be either unable to contribute resources or who may be a vector for disease transmission. Therefore, stigmatization of chronic illness may be an adaptive characteristic, in that sicker and weaker members of the group are avoided by others to promote the health and success of the group. This evolutionary explanation may provide an insight into why students experience stigmatization from their peers for their illness symptoms.

Research has provided evidence that college students are often not likely to seek help for mental and physical illnesses due to fears and perceptions of illness stigma. Further, it has been found that in college students, stigma may be related to poor help seeking, specifically decreased social support, use of medication, and perceived need for therapy (Eisenberg, Downs, Golberstein, & Zivin, 2009). Though only examined for mental health treatment, this research suggests evidence that fears of stigmatization from
others may provide a reason college students fail to seek out or adhere to treatment for chronic conditions.

Visibility of chronic conditions may have a significant affect on stigmatization. Research conducted by Ginsburg & Link (1993) revealed that patients with psoriasis report feeling that their outward physical symptoms of chronic illness can lead to greater stigmatization. Results of the research provided evidence that perceptions of stigmatization and social rejection related to chronic psoriasis led to internalizations of pain and suffering. Many participants reported perceived stigma resulting in distinct occurrences of social rejection. Thus, research supports that negative perceptions about one’s chronic physical illness result in suffering due to the experience and internalization of stigmatization.

As research suggests, it is important to consider how stigmatization of chronic illnesses impacts psychological functioning. Jones and colleagues (1984) established the way in which one is affected by stigmatization of chronic symptoms is dependent on the level of disruption on one’s life (Jones, Farina, Hastorf, Markus, Miller, & Scott, 1984). Research by Ginsburg and Link (1993) found that patients with psoriasis, a chronic condition with obvious outward physical symptoms, experienced severe stigmatization in the form of avoidance and judgment by others. Stigmatization through avoidant and isolative behavior resulted in negative outcomes through disruption and limitation of social status. Thus, it appears evident that disruptive, stigmatizing events result in severe consequences on the psychological and social well-being of chronically ill individuals.
Stigmatization of chronic illnesses, though perhaps evolutionarily beneficial, does little to help individuals afflicted with the illness in contemporary society (Kurzban & Leary, 2001). The previously discussed research informs that chronic illness stigma can result in impacted psychological functioning, declines in social status, and changes in how one perceives their own illness. Avoidance by others because of one’s health status impacts the disease course and may lead the individual down a path of avoidance of their own symptoms. As such, stigma is key to measure in relation to the research at hand, in order to better understand specific mechanisms through which HRQoL and psychological functioning may be impacted.

**Adherence and Avoidance**

The illness experience differs on an individual basis for those affected by chronic symptoms; these differences are often contingent on factors like the nature of the illness and daily maintenance of symptoms (Bury, 1982). Maintenance of symptoms often varies by disease type, and on a continuum of intrusiveness (Clark, 2003). Poor psychological health, for example, indicated by depressive symptoms, appears to impede patients’ ability to understand the importance of maintaining a treatment regimen (Houston, Tatum, Guy, Mikrut, & Yoder, 2015). Thus, such factors often make adherence difficult to maintain and low across illness type, age, and the type of treatment (Dunbar-Jacob & Mortimer-Stevens, 2001).

Some barriers to adherence are characteristic of undergraduate students, and thus may make following a treatment plan or sticking to a medication regimen even less likely to occur (Pai & Ostendorf, 2011). During emerging adulthood, when a significant
proportion of patients are entering higher education, a transition in health care occurs, where patients end care through a pediatrician and switch to adult-centered treatment (Pai & Ostendorf, 2011). Occurring alongside this transition is the individual assuming more responsibility for their health and managing symptoms with increased independence. A common consequence of this transfer of responsibility from caregiver-to-child and pediatric-to-adult is a significant drop in treatment adherence (Pai & Ostendorf, 2011). For example, results of a meta-analysis showed that doctor’s office attendance and medication adherence dropped as drastically as 50% from what they had been when care had been handled by a parent or guardian, rather than the emerging adult; this poor adherence to appointments and treatments resulted in substantially negative health outcomes, to the extent of the death of a number of patients in a study of young adult transplant patients (Annunziato, Emre, Shneider, Barton, Dugan, & Shemesh, 2007). Thus, poor symptom management and non-adherence to suggested treatment can have severe, and even fatal, consequences. Because the college student subgroup is especially vulnerable to non-adherence, understanding related factors to avoid adverse outcomes is vital.

Often hand-in-hand with non-adherence is symptom avoidance. Those that suffer from chronic pain and illness often expend a great deal of effort attempting to avoid their symptoms (Philips, 1987). Pain levels and environmental rewards for avoidance, such as not experiencing pain or leading a momentarily perceived disease-free life, both contribute to further engagement in avoidant behaviors (Philips, 1987). Philips argues that avoidance of chronic pain may actually play a role in sustaining the painful
experience; further research provided that avoidance of certain stimuli actually led to increased sensitivity to the same stimulus (Philips and Jahanshahi, 1985). Simply, by avoiding the painful stimulus, one combines a painful memory with a painful expectation, and thus perceives it to be worse. These expectations may also lead to pain-related fear, through possible misconceptions or false predictions about pain following engaging in an activity. Such pain-related fear has been found to be implicated in greater self-perceived disability (Vlaeyen & Linton, 2000). Thus, through a maladaptive pathway, avoidance of chronic illness can actually prolong symptoms, impact one’s self-perception, and result in unfavorable psychological functioning.

Poor adherence to suggested treatments may be due in part to lack of acceptance of one’s symptoms (Stanton, Collins, & Sworowski, 2001). Acceptance, considered to be recognition of one’s diseased status, is contingent on a number of factors (Zalewska, Miniszewska, Chodkiewicz, & Narbutt, 2006). Research suggests a maladaptive emotion-focused cognitive triad contributes to one’s beliefs and acceptance of their chronic illness. As Bombardier, D’Amico, & Jordan (1990) state, this cognitive triad, composed of wishful thinking (e.g., hoping a miracle would happen), self blame (e.g., I brought this problem on myself), and avoidance (e.g., ignored symptoms, continued on as if no diagnosis had been made), is a predictor of negative outcomes of illness-related functioning. The combination of each of these coping styles resulted in decreases in functioning and adjustment to one’s chronic illness diagnosis. Further, coping by avoidant methods was predictive of greater psychological impairment and worse perceptions of symptom severity (Bombardier, D’Amico, & Jordan, 1990). Thus, a
cognitive triad directed toward chronic symptoms may result in the furthering of symptoms, rather than symptom reduction. Further research conducted by Felton and Revenson (1984) provided support for this hypothesis; in their study, avoidant coping styles were also linked to negative outcomes. Specifically, wish-fulfilling fantasy coping, an avoidant method of diverting attention from the reality of the illness, was found to be related to especially poor adjustment. As these studies cite, lack of acceptance of one’s illness state often leads to the employment of avoidant coping methods. Ultimately, such coping likely results in negative psychological and social outcomes and decreases in overall health.

In sum, avoidance of the symptoms of chronic illness like results in negative repercussions. Psychological and social impacts are imminent, as the research provides. Psychologically, as avoidant coping is utilized to deal with symptoms, reported negative emotion increases. Negative psychological outcomes are then likely to lead to a reduction in social contact; further, the individual may also experience a worsening of symptoms with avoidant methods, requiring greater symptom maintenance. Thus, the inability to accept and actively cope with chronic symptoms in a healthy, constructive manner results in not only impacted physical functioning, but a decrease in psychological health, as well.

**Present Study**

Based on the evidence provided, there is a dire need for research that specifically examines how stigma and avoidance affect individuals with chronic illnesses. Though there is a wealth of research examining how illnesses affect academic functioning for college students, the field is lacking in a thorough understanding of how chronic illness
and related factors can impact a college student’s psychological functioning and HRQoL. The research reviewed here suggests that with diagnosis of a chronic illness, one is likely to (1) experience stigmatization related to their symptoms, (2) act to avoid the symptoms of their illness, and (3) have negatively impacted HRQoL and psychological functioning.

As proposed, it is suspected that the mechanism through which one experiences stigma in relation to their illness is based in how the illness impacts their everyday life. For example, stigmatization has been found to have significant impacts on one’s psychological well-being, to the extent that it was found to be the single best predictor of depression in those with chronic illnesses (Gupta, Gupta, & Watteel, 1998). As detailed above, the psychological well-being of the chronically-ill college student is contingent on many factors. Most commonly implicated in this aspect of the illness experience is positive social support; research has provided evidence that participation in positive social relationships is beneficial for health (Umberson & Montez, 2010). Increased understanding of what psychological well-being looks like in students with chronic symptoms is expected to emerge from the proposed research.

Finally, avoidant behaviors are suspected to be an ineffective means for coping with many of the imminent problems associated with chronic illness. Avoidant behaviors, though momentarily rewarding, often result in decreased functioning and significant psychological impairment (Bombardier, D’Amico, & Jordan, 1990), and may ultimately sustain the painful experience (Philips, 1987). Understanding the coping styles of students with chronic symptoms ultimately allows for the promotion of positive psychological outcomes.
It is hypothesized that individual relationships will be found between each of the predictor variables, stigma, avoidance, and social functioning, and the outcome variables, HRQoL, depression, and anxiety. Second, it is hypothesized that avoidant coping will moderate the relationship between stigma and the outcome variables, such that levels of the outcome variables are greater for those who experience stigma and cope via avoidant strategies.

These constructs have yet to be analyzed in combination. In an attempt to address a gap in the research base, the proposed research seeks to examine how college students with chronic illness experience illness-related stigmatization, manage or avoid their illness while in college, and function psychologically. Determining how these constructs, both independently and in combination, affect HRQoL is the ultimate goal of this research. Though each of the constructs described are well understood in isolation, their combined effect on the lifestyles of college students with chronic illness warrants further investigation. The results of the proposed research are hypothesized to assist researchers, clinicians, parents, peers, and students themselves attain a better understanding of the chronic conditions college students face.
STUDY 1

Methods

Recruitment.

Participants Recruited on Campus

Multiple recruitment methods were utilized. First, an email containing a link to the online survey was distributed to students enrolled in undergraduate psychology courses at a private Midwestern university. Participants were allowed one hour to complete the survey. In the email they received, participants were invited to forward the survey on to other students with a chronic illness diagnosis from the same private university with the prompt,

“If you know other students who have chronic illnesses, we invite you to forward this survey on to them, so that we can understand the challenges they face, should they differ from yours. If you wish to do so, please forward this email to them.”

Due to the small size of the campus and the specific target population, as well as to ensure participant confidentiality, every effort was taken to eliminate associations between collected data and identifying information. For this reason, the decision was made to not provide compensation of any form, monetary, course credit, or otherwise.

After the campus-wide survey had been distributed, participation was reviewed. Though the survey had been made available to students for over two months, only one
individual had participated. This version of the survey was closed to participation, and data collection through this means was discontinued. As this individual’s responses were uniquely identifiable, their responses were not included in the final data set.

**Participants Recruited Through Amazon’s Mechanical Turk.**

Amazon’s MechanicalTurk (mTurk) was also utilized for data collection. mTurk, an online platform where qualified participants can respond to brief surveys and tasks in exchange for small financial compensation, allows for collection of a more diverse and representative sample of the United States than can be done on a Midwestern college campus (Buhrmester, Kwang, & Gosling, 2011).

Participants recruited through mTurk signed into the online platform and opted into participating in the survey, described as, “Share your experience of living with and managing the symptoms of chronic illness while being an undergraduate in college.” They then received the survey link from the mTurk study site. Participants were allowed one hour to complete the battery of measures. Following completion of the survey, participants entered a randomized code they were provided at the end of the survey into the mTurk platform. Each participant was compensated $1 USD for completing the survey with their associated randomized survey code.

**IRB Approval.**

Approval from the IRB committee to conduct this research was obtained on April 19th, 2017.

**Participants.**

Initially, 298 individuals were recruited using an online survey. Participants were required to be current college students with a diagnosis of one or more chronic illnesses.
Exclusion criteria were: (1) outside of the age range of 18-40 years old ($n = 7$); (2) a discrepancy between the number of illnesses reported and a) the number of duration of illness options selected and/or b) the number of illness categories selected, unless a reason identified in the “other” column ($n = 23$); (3) neglected to answer all of the questions ($n = 36$); (4) reported no illnesses ($n = 9$); (5) indicated that they were not current college students ($n = 30$); or (6) did not finish the survey ($n = 48$). During data screening, five participants were excluded for being univariate outliers. A total of $n = 158$ participants were excluded.

A total of $n = 140$ participants met study qualifications. Participant age ranged from 19-40 years old ($M = 25.11$, $SD = 4.48$). The sample was approximately one-half male, and over 60% identified as Caucasian. Approximately 60% identified as a college senior. Nearly three-quarters of the participants identified as a full-time student, and 50% were employed at least part-time. The majority of participants, 77%, reported having one chronic condition, and 55% endorsed having one or more diagnosed chronic illnesses for more than two years. The most commonly reported category of chronic illness was “Pain (e.g., chronic pain, orthopedic injury)”, with nearly one-third of the sample endorsing this type of condition. The second most prevalent illness was respiratory illness (e.g., asthma, cystic fibrosis), with one-fifth of respondents indicating experiencing such symptoms. Nearly one-fifth reported experiencing bowel/GI illness. See Table 1 for specific characteristics of each demographic category.
### Table 1. Study 1 Participant Demographics (n = 140)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Participants</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>N</td>
<td>%</td>
<td>M</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>72</td>
<td>51.4</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>68</td>
<td>48.6</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>85</td>
<td>60.7</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>23</td>
<td>16.4</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>10</td>
<td>7.1</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>8</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>7</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>5</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>Native American</td>
<td>2</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Student Standing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior</td>
<td>86</td>
<td>61.4</td>
<td></td>
</tr>
<tr>
<td>Junior</td>
<td>37</td>
<td>26.4</td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>9</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>Sophomore</td>
<td>8</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Enrollment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-Time</td>
<td>108</td>
<td>77.1</td>
<td></td>
</tr>
<tr>
<td>Part-Time</td>
<td>32</td>
<td>22.9</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part-Time</td>
<td>72</td>
<td>51.4</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>35</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Full-Time</td>
<td>33</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$0-$25,000</td>
<td>43</td>
<td>30.7</td>
<td></td>
</tr>
<tr>
<td>$25,000-$50,000</td>
<td>42</td>
<td>30.0</td>
<td></td>
</tr>
<tr>
<td>$50,000-$75,000</td>
<td>32</td>
<td>22.9</td>
<td></td>
</tr>
<tr>
<td>$75,000-$100,000</td>
<td>15</td>
<td>10.7</td>
<td></td>
</tr>
<tr>
<td>$100,000+</td>
<td>8</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Number of Illnesses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>108</td>
<td>77.1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>17.9</td>
<td></td>
</tr>
<tr>
<td>More than 2</td>
<td>7</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>Illness Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24+ Months</td>
<td>77</td>
<td>55.0</td>
<td></td>
</tr>
<tr>
<td>12-18 Months</td>
<td>34</td>
<td>24.3</td>
<td></td>
</tr>
<tr>
<td>18-24 Months</td>
<td>19</td>
<td>13.6</td>
<td></td>
</tr>
<tr>
<td>0-6 Months</td>
<td>16</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>Illness Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>44</td>
<td>31.4</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>28</td>
<td>20.0</td>
<td></td>
</tr>
<tr>
<td>Bowel/GI</td>
<td>24</td>
<td>17.1</td>
<td></td>
</tr>
<tr>
<td>Neurological</td>
<td>24</td>
<td>17.1</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>17</td>
<td>12.1</td>
<td></td>
</tr>
<tr>
<td>Endocrine</td>
<td>16</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>13</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>Immune</td>
<td>13</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>Renal</td>
<td>8</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Sensory Impairment</td>
<td>3</td>
<td>2.1</td>
<td></td>
</tr>
</tbody>
</table>
Materials.

**Test Administration.** All measures were administered online via survey software application (Survey Monkey, Inc; 2017). See Appendices A, B, and D for a full report of the measures used as they were presented to participants. Appendix A describes specifics of the demographics measure for participants recruited on-campus in Study 1. Appendix B entails the demographics measure for participants recruited through mTurk in Study 1. Appendix D delineates each measure as presented to participants.

**Demographics and Illness Information.** Participants were asked to respond to questions regarding demographic information, including age, gender, racial/ethnic identity, education level, employment status, and annual family income. Participants also responded to questions relating to their chronic illnesses, including how many chronic illnesses they had been diagnosed with, how long they had been diagnosed with such illnesses, and what type(s) of illness they experience, presented in categories with examples of different illnesses. Age and racial/ethnic identity were answered through open-ended responses; all other questions were in the form of multiple choice.

In addition to the demographics and illness questionnaire, participants recruited through university email were asked how they were recruited to participate, whether through email from the graduate student investigator or through an email from a friend. This question was asked in order to differentiate recruitment methods and provide further information about social contact and support.

**Avoidance.** The Acceptance and Action Questionnaire - II (AAQ-II; Bond et al., 2011) was used to assess avoidance of chronic illness symptoms. The measure is a 7-item
self report questionnaire. Responses are given on a 7-point scale (1 = never true, 7 = always true). For example, “My painful experiences and memories make it difficult for me to live a life that I would value.” High scores equate to greater levels of psychological avoidance of chronic illness thoughts. The AAQ-II demonstrated strong internal consistency ($\alpha = .92$).

**Health-Related Quality of Life.** In order to understand the impact of health status on quality of life, the Illness Intrusiveness Rating Scale (IIRS; Devins, 2010) was utilized. The IIRS uses a 7-point scale (1 = not very much, 7 = very much) to assess the extent to which one’s chronic illness impinges on their normal functioning. Participants are provided with a prompt, “Please select the number that best describes your current life situation,” and self-report their answers to each of the 13 items on topics including work, recreation, and social relations. High scores suggest greater intrusiveness of illnesses on one’s life, and thus worse HRQoL. The internal consistency of scores in the current sample on the IIRS was strong ($\alpha = .90$).

**Stigma.** Perceptions of stigma were assessed using the Stigma Scale for Chronic Illnesses 8-Item Version (SSCI-8; Molina, Choi, Cella, and Rao, 2013). This measure examines both internalized and externalized aspects of stigma. An example of an item seeking to assess internalized stigma is, “I felt embarrassed about my illness.” Additionally, “Because of my illness, people were unkind to me,” seeks to uncover one’s experience of externalized stigma. Participants respond on a 5-point scale from 1 (never) to 5 (always). Lesser scores equate to experiencing low levels of stigma; high scores suggest greater experienced stigma. The internal consistency of scores in the current
sample was strong ($\alpha = .91$).

**Social Functioning.** In order to understand participants’ level of social functioning, the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) was used. This scale assesses the extent to which one receives social support, and how connected they feel to others. For example, “There is a special person who is around when I am in need,” and “I get the emotional help and support I need from my family,” are items from the measure. Participants respond on a scale of 1 (strongly disagree) to 7 (strongly agree). High scores suggest greater social support. The internal consistency of scores in the current sample was strong ($\alpha = .90$).

**Mental Health.** To assess mental health functioning, two separate measures were used.

**Depression.** In order to determine depressive symptoms, the Center for the Epidemiological Studies of Depression Short Form (CES-D-10; Radloff, 1977) was utilized. Using ten self-report items, participants responded to how often they experienced negative or depressive symptoms (rarely, less than 1 day; some or a little of the time, 1-2 days; occasionally or a moderate amount of time, 3-4 days; most or all of the time, 5-7 days). “I felt lonely,” or “I could not get ‘going’, ” are examples of items from the measure. High scores on the measure indicate greater levels of depression symptoms. The internal consistency of scores in the current sample was good ($\alpha = .84$).

**Anxiety.** Level of anxiety was assessed using the 7-item generalized anxiety scale (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006). For this scale,
participants are provided with a prompt, “Over the last 2 weeks, how often have you been bothered by the following problems?” then respond to seven items assessing for anxious symptoms on a temporal scale of 0 = not at all sure to 3 = nearly every day. Higher scores indicate greater difficulties with anxiety. The internal consistency of scores in the current sample on the GAD-7 was strong (α = .92).

**Procedures.**

Participants were recruited from those who opted to participate after either receiving an email from the researcher or reading the study advertisement on mTurk. Participants were required to read and electronically sign the informed consent; they were then forwarded to the battery of measures. The entire administration for all participants was completed online using SurveyMonkey. Following completion of the survey, participants from the university were asked to forward the survey link on to other college students they knew with chronic illness diagnoses. Participants from mTurk received compensation for their participation following completion of the survey.

**Data Analysis.**

All data was analyzed using SPSS Version 24.0 (IBM, 2017). Tests were two-tailed with α = .05, unless otherwise noted.

**Planned Analyses.**

To examine the individual relationships between stigma, avoidance, and social functioning with HRQoL, depression, and anxiety, correlation analyses were planned. Linear regression was utilized to examine the primary study hypotheses related to the
effects of stigma, avoidant coping, and social functioning on each of the outcome
variables, HRQoL, depression, and anxiety. The interaction effect of avoidance and
stigma on each outcome variable was assessed using hierarchical linear regression; to
reduce collinearity, stigma and avoidant coping were centered. Then, a cross product was
calculated to represent the interaction term. The centered variables were entered into the
first block, followed by the interaction term in the second block.

The data set \((n = 140)\) was assessed for the assumptions of linear regression. The
assumption of normality was assessed using two means, statistical methods (Shapiro-
Wilk test), and visual methods (histograms, boxplots). The assumptions of linearity and
homoscedasticity were assessed using visual inspection of scatter plots. Durbin-Watson
score was utilized to assess the assumption of independence. Multicollinearity was
assessed for with tolerance and VIF scores.

Assumptions of correlation were also assessed. Variables assessed were
continuous and paired. Outliers and linearity were assessed using scatterplots. The
assumption of normality was assessed using the Shapiro-Wilk test.

Data were excluded from final calculations if standardized \(z\)-scores on any
measure exceeded the cutoff of \(z = 2.58\) \((\alpha = .01)\). This alpha level was selected to retain
enough participants for optimal statistical power, while also eliminating extreme scores.
RESULTS

A total of $N = 140$ participants were included in the final data set. Five participants were excluded, as they exhibited scores determined to be univariate outliers on differing measures. Univariate outliers are defined in Study 1 as a standardized score on any measure exceeding $z = 2.58$ ($\alpha = .01$).

**Relationships of Stigma, Avoidance, and Social Functioning and Health-Related Quality of Life.**

Bivariate correlation analyses were conducted to examine the relationships between stigma, avoidance, social functioning, and HRQoL. Analyses revealed that the hypothesis stating that relationships would exist between these variables was partially supported. Specifically, stigma ($M = 19.36$, $SD = 7.41$) was significantly correlated with avoidance ($M = 26.18$, $SD = 9.82$), $r = .59$, $p < .001$, such that more severe experiences with stigma were associated with a stronger avoidant coping style. Stigma and social support ($M = 63.59$, $SD = 12.89$) were significantly negatively correlated, $r = -.37$, $p < .001$, suggesting that more severe experiences with stigma reported were associated with poor social support. Avoidance and social support were also significantly negatively correlated, $r = -.17$, $p = .040$. Therefore, those with a stronger avoidant coping style also reported weaker social support. Stigma ($r = .63$, $p < .001$) and avoidant coping style ($r = .62$, $p < .001$) were also correlated with HRQoL ($M = 46.69$, $SD = 15.20$). Social support
was not significantly correlated with HRQoL, \( r = -.10, p = .263 \). See Table 2 for details of correlation analyses.

**Table 2.** Means, Standard Deviations, and Correlations Between Primary Study Variables in Study 1 \((n = 140)\)

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: AAQ-II</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: IIRS</td>
<td>.62***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: SSCI-8</td>
<td>.59***</td>
<td>.63***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4: MSPSS</td>
<td>-.17*</td>
<td>-.10</td>
<td>-.37***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5: CESD-10</td>
<td>.73***</td>
<td>.64***</td>
<td>.58***</td>
<td>-.24*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6: GAD-7</td>
<td>.66***</td>
<td>.51***</td>
<td>.53***</td>
<td>-.17*</td>
<td>.82***</td>
<td></td>
</tr>
</tbody>
</table>

\( M = 26.18 \)

\( SD = 9.82 \)

* \( p < .05 \)
** \( p < .01 \)
*** \( p < .001 \)

Note. AAQ-II – Acceptance and Action Questionnaire – II; IIRS – Illness Intrusiveness Rating Scale; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item; MSPSS – Multidimensional Scale of Perceived Social Support; CESD-10 – Center for Epidemiological Studies of Depression Short Form; GAD-7 – Generalized Anxiety Disorder Scale 7-Item

To further analyze the relationships between the predictor variables and the outcome, HRQoL, regression analyses were performed. Prior to completing the analysis, data were examined violations to the assumptions of regression. Analyses revealed no violations of assumptions.

Results of the multiple linear regression revealed support for the hypothesis that a significant relationship would be found between stigma, avoidant means of coping, and social support with HRQoL. Specifically, the overall model with all variables entered was significant, \( R^2 = .51, F(3, 136) = 46.73, p < .001 \). Examination of the individual variables revealed that stigma (\( \beta = .45, p < .001 \)), avoidant coping (\( \beta = .38, p < .001 \)), and social support (\( \beta = .14, p = .034 \)), all significantly predicted HRQoL. See Table 3 for specifics of multiple linear regression analyses.
Table 3. Regression Analyses Predicting Health-Related Quality of Life (HRQoL) in Study 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAQ-II</td>
<td>.38</td>
<td>5.05</td>
<td>&lt; .001</td>
<td>.51</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.45</td>
<td>5.71</td>
<td>&lt; .001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSPSS</td>
<td>.14</td>
<td>2.14</td>
<td>.034</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item; MSPSS – Multidimensional Scale of Perceived Social Support

The hypothesis that the interaction of stigmatization and avoidant coping style would predict HRQoL was not supported. This hypothesis specifically posited that avoidant coping would moderate the relationship between stigma and HRQoL, such that HRQoL outcomes are worse for those who report experiencing stigma and avoidant coping. Results suggested no differential effect of experiencing both stigmatization and having a stronger avoidant coping style on HRQoL. See Table 4 for specifics of the hierarchical regression with stigma and avoidant coping predicting HRQoL in Study 1.
Table 4. Regression Analyses Predicting Health-Related Quality of Life (HRQoL) from Stigma x Avoidant Coping Interaction in Study 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td>.70</td>
<td>.49</td>
<td>.49</td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.39</td>
<td>5.13</td>
<td>&lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.40</td>
<td>5.23</td>
<td>&lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td>.70</td>
<td>.49</td>
<td>.00</td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.39</td>
<td>4.99</td>
<td>&lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.40</td>
<td>5.16</td>
<td>&lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQxSSCI</td>
<td>-.01</td>
<td>-.22</td>
<td>.827</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-item

**Relationships of Stigma, Avoidance, and Social Functioning and Depression.**

Bivariate correlation analyses were utilized to examine the relationships between stigma, avoidant coping, social functioning, and depression; these analyses revealed that the hypothesized relationships between these variables were supported. Stigma ($M = 19.36, SD = 7.41$) was significantly correlated with avoidance ($M = 26.18, SD = 9.82$), $r = .59, p < .001$, such that more severe experiences with stigma were associated with a stronger avoidant coping style. Stigma and social support ($M = 63.59, SD = 12.89$) were significantly negatively correlated, $r = -.37, p < .001$, suggesting that more severe experiences with stigma were associated with poor social support. Avoidance and social support were significantly negatively correlated, $r = -.17, p < .040$, such that those with a stronger avoidant coping style also reported weaker social support. Stigma ($r = .58, p < .001$), avoidant coping style ($r = .73, p < .001$), and social support ($r = -.24, p = .004$)
were correlated with depression \((M = 10.25, SD = 6.01)\). The relationship between stigmatizing experiences and depression, as well as avoidant coping style and depression, suggests that those who endorsed greater stigmatizing experiences reported greater depressive symptoms, as well as those who reported a stronger avoidant coping style reported greater depressive symptoms. The relationship between social support and depression was negative, suggesting that those who endorsed higher social support reported less depressive symptoms. See Table 2 for details of correlation analyses.

To further analyze the relationships between the predictor variables and the outcome, depression, multiple linear regression analysis was used. As established, initial analyses revealed no violations of the assumptions of regression. Results of the multiple regression revealed support for the hypothesis. Specifically, the overall model with all variables entered was significant, \(R^2 = .57, F(3, 136) = 60.69, p < .001\). Examination of the individual variables provided that stigma \((\beta = .20, p = .007)\) and avoidant coping \((\beta = .60, p < .001)\) significantly predicted depression, yet social support \((\beta = -.06, p = .307)\) did not. See Table 5 for specifics of multiple linear regression analyses.

**Table 5. Regression Analyses Predicting Depression in Study 1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>(\beta)</th>
<th>(t)</th>
<th>(p)</th>
<th>(R^2)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAQ-II</td>
<td>.60</td>
<td>8.60</td>
<td>&lt; .001</td>
<td>.57</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.20</td>
<td>2.73</td>
<td>.007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSPSS</td>
<td>-0.06</td>
<td>-1.03</td>
<td>.307</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item; MSPSS – Multidimensional Scale of Perceived Social Support
The hypothesis that the interaction of stigmatization and avoidant coping style would predict depressive symptoms was not supported. Results revealed there was no moderative effect of avoidant coping on the relationship between stigma and depressive symptoms. There was no differential effect of experiencing both more severe stigmatization and having a stronger avoidant coping style on depressive symptoms. See Table 6 for details of hierarchical regression analysis describing the interaction of stigma and avoidant coping on depressive symptoms.

**Table 6. Regression Analyses Predicting Depression from Stigma x Avoidant Coping Interaction in Study 1**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.60</td>
<td>8.55</td>
<td>&lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.23</td>
<td>3.22</td>
<td>&lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.60</td>
<td>8.42</td>
<td>&lt; .001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.23</td>
<td>3.18</td>
<td>.002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQxSSCI</td>
<td>.01</td>
<td>.14</td>
<td>.890</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item

**Relationships of Stigma, Avoidance, and Social Functioning and Anxiety.**

Bivariate correlation analyses were conducted to examine the relationships between stigma, avoidance, social functioning, and anxiety revealed that the hypothesized relationships between these variables were supported. Specifically, stigma ($M = 19.36, SD = 7.41$) was significantly correlated with avoidance ($M = 26.18, SD =$
9.82), \( r = .59, p < .001 \), such that more severe experiences with stigma were associated with a stronger avoidant coping style. Stigma and social support (\( M = 63.59, SD = 12.89 \)) were significantly negatively correlated, \( r = -.37, p < .001 \), suggesting that more severe experiences with stigma reported were associated with poor social support. Avoidance and social support were significantly correlated, \( r = -.17, p = .040 \). Therefore, those with a stronger avoidant coping style also reported weaker social support. Stigma (\( r = .53, p < .001 \)), social support (\( r = -.17, p = .049 \)), and avoidant coping (\( r = .66, p < .001 \)) were all significantly correlated with increased anxiety symptoms. Stigma and avoidant coping were both related to anxious symptoms such that increased stigmatizing experiences or greater avoidant coping style were related to increased anxiety symptoms. Social support and anxiety symptoms were related such that increased social support resulted in decreased symptoms of anxiety. See Table 2 for details of correlation analyses.

To further analyze the relationships between the predictor variables and the outcome, anxiety, regression analyses were performed. As established, analyses revealed no violations to the assumptions of regression. Results of the multiple regression analyses revealed support for the hypothesis. Specifically, the overall model with all variables entered was significant, \( R^2 = .47, F(3, 136) = 40.04, p < .001 \). Examination of the individual variables revealed that stigma (\( \beta = .21, p = .010 \)) and avoidant coping (\( \beta = .54, p < .001 \)) significantly predicted anxiety; social support (\( \beta = .01, p = .922 \)) was not found to be a significant predictor of anxiety. See Table 7 for specifics of regression analyses.
The hypothesis that the interaction of stigmatization and avoidant coping style would also predict anxiety symptoms was not supported. There was no differential effect of experiencing both more severe stigmatization and having a stronger avoidant coping style on anxiety symptoms. See Table 8 for details of hierarchical regression analyses examining a hypothesized moderate effect of avoidant coping on the relationship between stigmatization and anxious symptoms.

**Table 7.** Regression Analyses Predicting Anxiety in Study 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAQ-II</td>
<td>.54</td>
<td>6.90</td>
<td>&lt; .001</td>
<td>.47</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.21</td>
<td>2.60</td>
<td>.010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSPSS</td>
<td>.01</td>
<td>.10</td>
<td>.922</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item; MSPSS – Multidimensional Scale of Perceived Social Support

**Table 8.** Regression Analyses Predicting Anxiety from Stigma x Avoidant Coping Interaction in Study 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td>.69</td>
<td>.47</td>
<td>.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.54</td>
<td>6.94</td>
<td>&lt; .001</td>
<td></td>
<td>.47</td>
<td>.47</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.21</td>
<td>2.74</td>
<td>.007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td>.69</td>
<td>.48</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.56</td>
<td>7.17</td>
<td>&lt; .001</td>
<td>.69</td>
<td>.48</td>
<td>.01</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.19</td>
<td>2.40</td>
<td>.018</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQxSSCI</td>
<td>.11</td>
<td>1.66</td>
<td>.099</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item
Health-Related Quality of Life.

As established, the definition of HRQoL should consist of many components, including physical and psychological functioning (Aaronson, 1988). This multifaceted nature, as well as the results of Study 1, provide evidence that the HRQoL of college students with chronic illnesses is vulnerable to many factors. Overall, results suggest that as stigmatizing experiences and utilization of avoidant coping style increase and social support decreases, HRQoL significantly decreases. Such results not only support the hypotheses described, but are also consistent with the literature on HRQoL in chronically-ill individuals (Herts, Wallis, & Maslow, 2014).

Results provide evidence for the majority of hypotheses stated. The individual relationships found between the predictor variables, stigma, avoidant coping, and social functioning, and the outcome, HRQoL, suggest that as stigma experiences increase, both in number and severity, utilization of avoidant coping increases. Relatedly, stigmatizing experiences and social support were found to be related such that increased stigmatizing experiences are related to significant decreases in social support. Social support was also related to avoidant coping, such that increased avoidant coping resulted in worse perceptions of social support.
Results of the correlational analyses provide primary support for the hypothesized significant relationships between predictor and outcome variables, as well. Stigma, avoidance, and social functioning were all significantly related. Further, low scores on HRQoL were found to be significantly related to high scores on stigma and avoidant coping style measures in the chronically-ill sample surveyed. Social support was not related to HRQoL, suggesting that for participants in Study 1, outcomes related to HRQoL were not related to perceived level of social support. Such findings suggest an association between variables not previously explored in this population, providing insight into the correspondent nature of stigmatizing experiences, avoidant coping style, and social support with HRQoL.

Regression analyses were utilized to further analyze the relationships between stigma, avoidant coping, and social support with HRQoL. The significant relationship found suggests that stigma, avoidant coping, and social support are able to predict HRQoL in college students with chronic illness. Such findings not only support hypotheses, but also suggest a greater importance about the role that each of these factors play in the lifestyle of chronically-ill individuals. While the individual relationships between each of these have already been established, understanding of the predictive abilities of these variables can assist in understanding how these characteristics specifically influence the HRQoL of college students with chronic illnesses, as well as to better predict outcomes.

An interaction effect of stigma and avoidant coping on HRQoL was hypothesized, but not found. Support for this hypothesis required that the HRQoL was low for those who reported high levels of stigmatizing experiences, but even lower for those who
experienced stigma and utilized an avoidant means of coping. Such a relationship was not found. The lack of support for this hypothesis in Study 1 suggests that there is no differential effect of experiencing high levels of stigmatizing experiences, as well as greater utilization of an avoidant coping style. While the individual relationships between these two predictors, stigmatizing experiences and avoidant means of coping, were established with HRQoL, there appears to be no moderative effect of avoidant means of coping on the relationship between stigmatizing experiences and HRQoL. Previous research has examined the experiences and HRQoL of chronically-ill undergraduates (Herts, Wallis, & Maslow, 2014), but specific contributing factors have yet to be identified in the current literature; thus, further investigation into mediating and moderating variables of the relationship between stigma and HRQoL are warranted.

In Study 1, health-related quality of life was significantly related to and predicted by stigma, avoidant coping, and social support, suggesting that HRQoL outcomes in chronically-ill college students are vulnerable to a number of factors. Hypotheses related to HRQoL were largely supported by the data in Study 1, though a significant interaction effect was not found; such findings suggest that outcomes are not worse for those who experience both avoidant coping and stigma, suggesting that HRQoL will be the same regardless of whether one factor or both factors are experienced. Overall, such findings support hypotheses posited by Aaronson (1988), regarding the importance of including multiple physical and psychological characteristics in the understanding and definition of HRQoL. Expanding this definition to include stigmatizing, avoidant, and social factors facilitates earlier detection of diminished HRQoL; a broader definition allows for
increased intervention earlier in the disease course to promote long-term positive outcomes in HRQoL.

**Depression.**

Previous research has posited that the relationship between chronic illnesses and mental health are reciprocal (Katon, Lin, & Kroenke, 2007), suggesting that individuals with chronic illness are especially vulnerable to poor mental health outcomes. Further, this relationship warrants investigation, as it has been evidenced that poor mental health may result in more negative physical disease outcomes in those with chronic illnesses (Clarke & Currie, 2009). Additional research has suggested that up to one-fifth of individuals with chronic illness report depressive symptoms (Kagee, 2008). As such, it is hypothesized that significant relationships exist between the predictor variables, stigmatizing experiences, avoidant coping style, and social support, and the outcome, depression.

As hypothesized, significant, individual relationships were found between the predictor variables, stigma, avoidant coping, and social functioning, and the outcome, depression. Relationships were found between depression and stigma, avoidant coping, and social support, suggesting that depressive symptoms may be contingent on stigmatizing experiences, avoidant coping, and poor social support. Findings support the hypotheses posited by Katon, Lin, and Kroenke (2007), wherein they stated that symptoms of chronic illnesses are associated with poor mental health outcomes; further, the research conducted here provided support for their hypothesis that mental health outcomes have a correlational relationship with symptoms of chronic illness.
A predictive relationship was established between stigma and avoidant coping with depression, yet not with social support. These results provide evidence for a relationship where stigmatizing experiences and avoidant style of coping are predictive of depressive symptoms in individuals with chronic illnesses. These findings are largely concurrent with hypotheses described, with the exception of the hypothesized relationship with social support; further, understanding of how these factors are related beyond their individual relationships provides greater understanding of how differing outcomes may arise in this population.

Consistent with health-related quality of life, support was not found for an interactional relationship between avoidant coping and stigma on depression. Such results suggest that in the sample collected, depression was not worse for those who reported experiencing stigmatization, as well as coping through avoidant means. While this is in opposition with the hypothesized result, these findings suggest that there is no differential outcome for those who report experiencing stigmatization and avoidant means of coping. Due to a deficit in the literature examining the effects of stigmatizing experiences and avoidant coping on depression, specific contributing factors to the nonsignificant findings discussed are not well understood. Further investigation into the role of avoidant means of coping, as well as other factors, as a moderator of this relationship is warranted.

Unique relationships between stigma, avoidant coping, social functioning, and depression were exhibited in the data in Study 1. Based on this, the conclusion can be drawn that depressive symptoms are likely predicted by levels of stigma and avoidant coping in those with chronic illnesses. The relationships displayed suggest that
chronically-ill individuals have an increased vulnerability to depressive symptoms related to complications associated with the disease course, like illness-related stigma and avoidant means of coping. There is an immediate importance of addressing this vulnerability, in order to contribute to promoting positive psychological, physiological, and academic outcomes in this population.

**Anxiety.**

Previous research has found that as many as one-third of those with chronic illness exhibit symptoms of anxiety (Kagee, 2008). Similar to depression, anxious symptoms were hypothesized to be related to stigma, avoidant coping means, and social support. As described previously, significant relationships between stigma, avoidance, and social support were exhibited. Further, relationships were established between stigma, avoidant coping, and social support with anxiety, such that anxious symptoms may increase as stigma experiences increase, avoidant coping is utilized at greater levels, and as social support decreases. These findings suggest individual relationships between the predictor variables and the outcome, anxiety, to support previous research that exhibited increased anxiety symptoms associated with factors related to the disease course (Kagee, 2008).

A relationship was displayed by the data suggesting that stigma and avoidant coping are predictive of anxious symptoms in the sample of college students with chronic illness surveyed in Study 1. This is consistent with the current study’s findings related to depression. The hypothesized significant interaction of avoidance and stigma on anxious symptoms was not found. This suggests that, in the sample collected in Study 1, anxiety
was not worse for those who experienced high levels of stigma and greater utilization of avoidant coping. While individual relationships were established between each of these factors, a moderative effect of avoidant means of coping on the relationship between stigmatizing experiences and symptoms of anxiety were not found. Previous research has supported the relationship between stigmatizing experiences and anxious symptoms (Kagee, 2008), though the specific relationship between avoidant coping and anxiety has not been examined in detail. Thus, further examination into the relationship between stigmatizing experiences and symptoms of anxiety is warranted.

Overall, results suggest that in college students with chronic illnesses, anxious symptoms are related to experienced stigma, utilization of avoidant coping, and social support. While anxiety is a normal component of human functioning, those with chronic conditions may have a special vulnerability to anxious symptoms and distress. Understanding the role that factors associated with chronic illnesses, such as stigmatizing experiences, avoidant means of coping, and social support, play in the development of anxious symptoms is critical, as research provides evidence that poor mental health, indicated by anxious and depressive symptoms, has the ability to exacerbate negative outcomes of chronic conditions (Clarke & Currie, 2009).

**Study 1 Conclusions.**

Results of Study 1 largely provide support for the hypotheses proposed; specifically, individual relationships among predictor variables stigma, avoidance, and social functioning were exhibited with the outcomes, HRQoL, depression, and anxiety, with the exception of a relationship between social support and HRQoL. Further, stigma,
avoidant coping, and social functioning were significant as a composite of predictors of HRQoL, and avoidant coping and stigma significant as a composite of predictors of depression and anxiety; thus, differing levels of stigmatizing experiences, avoidant coping, and social support are hypothesized to lead to outcomes of HRQoL and mental health, such that increased stigmatizing experiences and avoidant coping in combination with decreased social support result in diminished HRQoL and increased depression and anxiety. Overall, these results suggest that college students with chronic illnesses are likely to face special vulnerabilities to HRQoL, depression, and anxiety as a result of experienced stigma, avoidant means of coping, and poor social support.

While hypotheses related to relationships between the individual variables were largely supported, evidence was not found to support the hypothesized interaction effect of stigmatizing experiences and avoidant coping on the outcome variables. Generally, these results suggest that outcomes are not worse for individuals who experience both stigma and avoidant coping than they are for individuals who experience only one of these predictor variables. Further, these findings suggest that avoidant coping does not moderate the relationship between stigma and each of the outcome variables. This suggests that either a) stigma alone is responsible for diminished HRQoL and increased depression and anxiety, or b) other factors may serve as mediators or moderators over the relationship between stigma and the outcome variables. Thus, further investigation into other factors that may result in worse outcomes for chronically-ill college students is warranted.
These findings in Study 1 are in accordance with the literature described above (Katon, Lin, & Kroenke, 2007; Kagee, 2008; Aaronson, 1988). Further understanding of the illness-related factors that contribute to negative outcomes in college students with chronic illness allow for the expansion of the definition of HRQoL, as Aaronson (1988) suggested, as well as provide a greater array of opportunities for intervention: at the level of stigmatization, coping skills, or social support. Additionally, understanding the impact of these factors on mental health outcomes allows for increased efficacy in mental health treatment, such that specific factors can be targeted to promote improvements in depressive and anxious symptoms. The research described in Study 1 furthers the current comprehension of the relationships between the predictor and outcome variables outlined, and promotes positive outcomes through increased understanding.
STUDY 2

Methods

Improvements on Previous Study.

After completing Study 1, certain aspects of the study were highlighted that necessitated improvement. In order to ensure the participants being compensated were completing the survey, and so as to attain the most accurate results, the survey in Study 2 was adjusted so that, in order to proceed to the next of each section of the survey, every question had to be answered. To further ensure that the study was recruiting individuals who were current college students, a multiple-choice option, “I am not in college,” was added to items A.4 and A.5. Following analysis and categorization of open-ended responses for chronic illness type, it was highlighted that diabetes was not represented in the options for experienced chronic illnesses; thus, categories were added for both Type 1 and Type 2 diabetes. Finally, it was recognized that the original survey did not include an illness duration option of 6-12 month; this option was added to the “duration of illness” component of the demographics section. See Appendix C for details of the amended demographics questionnaire used in Study 2.

Recruitment.

Following the relative lack of success of recruitment using on-campus methods in the first study, only mTurk was utilized for data collection in Study 2. mTurk participants
in Study 2 received the same version of the test battery as participants from Study 1 (see Appendix D), with the amended demographics questionnaire described above (see Appendix C). Participants recruited through these means received the survey link after opting into participating by signing the informed consent. They were allowed one hour to complete the battery of measures. After they had completed the survey, participants entered a randomized survey code they were provided at the end of the mTurk survey. Each participant recruited through mTurk received $1 compensation for participation.

IRB Approval.

Approval from the IRB committee to conduct this research was obtained on April 19th, 2017.

Participants.

Initially, 332 individuals were recruited through mTurk. Participants were required to be current college students with a diagnosis of one or more chronic illnesses. Exclusion criteria were: (1) outside of the age range of 18-40 years old (n = 9); (2) a discrepancy between the number of illnesses they reported and a) the number of duration of illness options selected and/or b) number of illness categories selected, unless a reason identified in the “other” column (n = 43); (3) reported no illnesses (n = 15); (4) reported that they were not current college students (n = 46); or (5) did not finish the survey (n = 21). During data screening, six participants were excluded for being univariate outliers. A total of n = 139 participants were excluded.

A total of n = 193 participants met study qualifications. Participant age ranged from 18-39 years old (M = 24.49, SD = 4.36). The sample was approximately one half male, and 65% identified as Caucasian. Approximately half reported being college
seniors. More than three quarters of the sample identified as a full-time student, and 51% were employed part-time. The majority, 37%, reported an income between $25,000 and $50,000. The majority of participants, approximately 81%, reported having one chronic illness; most of the sample, 54%, indicated having their illness for more than two years. The majority reported an income between $25,000 and $50,000. The majority of participants, approximately 81%, reported having one chronic illness; most of the sample, 54%, indicated having their illness for more than two years. The majority of participants, approximately 81%, reported having one chronic illness; most of the sample, 54%, indicated having their illness for more than two years. The most commonly reported category of chronic illness was “pain”, with almost one-third of participants reporting this type. Respiratory illnesses were the second most prevalent, with about one-fifth of respondents reporting this type. The third most prevalent illness was neurological illnesses, which were endorsed by one-sixth of respondents. See Table 9 for demographic specifics of participants in Study 2.
### Table 9. Study 2 Participant Demographics ($n = 193$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Participants</th>
<th>%</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td></td>
<td></td>
<td>24.49</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>100</td>
<td>51.8</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>93</td>
<td>47.7</td>
<td></td>
</tr>
<tr>
<td>Unspecified</td>
<td>1</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>125</td>
<td>64.8</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>18</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>18</td>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>Mixed</td>
<td>13</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>5</td>
<td>2.6</td>
<td></td>
</tr>
<tr>
<td>Native American</td>
<td>2</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Student Standing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior</td>
<td>95</td>
<td>49.2</td>
<td></td>
</tr>
<tr>
<td>Junior</td>
<td>54</td>
<td>28.0</td>
<td></td>
</tr>
<tr>
<td>Sophomore</td>
<td>33</td>
<td>17.1</td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>11</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Enrollment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-Time</td>
<td>154</td>
<td>79.8</td>
<td></td>
</tr>
<tr>
<td>Part-Time</td>
<td>39</td>
<td>20.2</td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part-Time</td>
<td>98</td>
<td>50.8</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>54</td>
<td>28.0</td>
<td></td>
</tr>
<tr>
<td>Full-Time</td>
<td>41</td>
<td>21.2</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$25,000-$50,000</td>
<td>71</td>
<td>36.8</td>
<td></td>
</tr>
<tr>
<td>$0-$25,000</td>
<td>47</td>
<td>24.4</td>
<td></td>
</tr>
<tr>
<td>$50,000-$75,000</td>
<td>46</td>
<td>23.8</td>
<td></td>
</tr>
<tr>
<td>$100,000+</td>
<td>15</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td>$75,000 - $100,000</td>
<td>14</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>Number of Illnesses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>156</td>
<td>80.8</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>27</td>
<td>14.0</td>
<td></td>
</tr>
<tr>
<td>More than 2</td>
<td>10</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>Illness Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24+ Months</td>
<td>104</td>
<td>53.9</td>
<td></td>
</tr>
<tr>
<td>6-12 Months</td>
<td>34</td>
<td>17.6</td>
<td></td>
</tr>
<tr>
<td>12-18 Months</td>
<td>28</td>
<td>14.5</td>
<td></td>
</tr>
<tr>
<td>18-24 Months</td>
<td>20</td>
<td>10.4</td>
<td></td>
</tr>
<tr>
<td>0-6 Months</td>
<td>15</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td>Illness Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>51</td>
<td>26.4</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>43</td>
<td>22.3</td>
<td></td>
</tr>
<tr>
<td>Neurological</td>
<td>31</td>
<td>16.1</td>
<td></td>
</tr>
<tr>
<td>Bowel/GI</td>
<td>25</td>
<td>13.0</td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>22</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>16</td>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td>Endocrine</td>
<td>15</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td>Type 2 Diabetes</td>
<td>11</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Immune</td>
<td>10</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>Type 1 Diabetes</td>
<td>9</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>Sensory</td>
<td>6</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Renal</td>
<td>4</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Infectious</td>
<td>2</td>
<td>1.0</td>
<td></td>
</tr>
</tbody>
</table>
Materials

Test Administration. All measures were administered online via survey software application (Survey Monkey, Inc.; 2017). See Appendices C and D for a full report of the measures used as they were presented to participants. Appendix C describes the demographics measure used for participants in Study 2. Appendix D delineates each measure used.

Measures. The same test battery was administered to participants in Study 2 as was used for mTurk participants in Study 1. For full details of the test battery, Appendix D.

Avoidance. The Acceptance and Action Questionnaire - II (AAQ-II; Bond et al., 2011) was used to assess avoidance of chronic illness symptoms. The measure is a 7-item self report questionnaire. Responses are given on a 7-point scale (1 = never true, 7 = always true). For example, “My painful experiences and memories make it difficult for me to live a life that I would value.” High scores equate to greater levels of psychological avoidance of chronic illness thoughts. The internal consistency of scores in the current sample was strong (α = .91).

Health-Related Quality of Life. In order to understand the impact of health status on quality of life, the Illness Intrusiveness Rating Scale (IIRS; Devins, 2010) was utilized. The IIRS uses a 7-point scale (1 = not very much, 7 = very much) to assess the extent to which one’s chronic illness impinges on their normal functioning. Participants are provided with a prompt, “Please select the number that best describes your current life situation,” and self-report their answers to each of the 13 items on topics like work,
recreation, and social relations. High scores suggest greater intrusiveness of illnesses on one’s life. The internal consistency of scores in the current sample was good ($\alpha = .88$).

**Stigma.** Perceptions of stigma were assessed using the Stigma Scale for Chronic Illnesses 8-Item Version (SSCI-8; Molina, Choi, Cella, and Rao, 2013). This measure examines both internalized and externalized aspects of stigma. An example of an item seeking to assess internalized stigma is, “I felt embarrassed about my illness.” Additionally, “Because of my illness, people were unkind to me,” seeks to uncover one’s experience of externalized stigma. Participants respond on a 5-point scale from 1 (*never*) to 5 (*always*). Lesser scores equate to experiencing low levels of stigma; high scores suggest greater experienced stigma. The internal consistency of scores in the current sample was good ($\alpha = .89$).

**Social Functioning.** In order to understand participants’ level of social functioning, the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) was used. This scale assesses the extent to which one receives social support, and how connected they feel to others. For example, “There is a special person who is around when I am in need,” and “I get the emotional help and support I need from my family,” are items from the measure. Participants respond on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). High scores suggest greater social support. The internal consistency of scores in the current sample on the MSPSS was strong ($\alpha = .92$).
Mental Health. To assess mental health functioning, two separate measures were used.

Depression. In order to determine depressive symptoms, the Center for the Epidemiological Studies of Depression Short Form (CES-D-10; Radloff, 1977) was utilized. Using ten self-report items, participants responded to how often they experienced negative or depressive symptoms (rarely, less than 1 day; some or a little of the time, 1-2 days; occasionally or a moderate amount of time, 3-4 days; most or all of the time, 5-7 days). “I felt lonely,” or “I could not get ‘going’,” are examples of items from the measure. High scores on the measure indicate greater levels of depression symptoms. The internal consistency of scores in the current sample was good (α = .85).

Anxiety. Level of anxiety was assessed using the 7-item generalized anxiety scale (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006). For this scale, participants are provided with a prompt, “Over the last 2 weeks, how often have you been bothered by the following problems?”, then respond to seven items assessing for anxious symptoms on a temporal scale of 0 = not at all sure to 3 = nearly every day. Higher scores indicate greater difficulties with anxiety. The GAD-7 exhibited strong internal consistency, (α = .90).

Procedures

Participants were recruited from those who opted to participate after seeing the study advertised on Amazon’s mTurk. After reading and electronically signing the informed consent document, participants were provided with the survey battery. Every
component of the administration was completed online using the survey platform SurveyMonkey (Survey Monkey Inc., 2017). Following completion of the survey, participants were compensated for their participation.

**Data Analysis**

All data was analyzed using SPSS Version 24.0 (IBM, 2017). Tests were two-tailed with $\alpha = .05$, unless otherwise noted.

**Planned Analyses**

To examine the individual relationships between stigma, avoidance, and social functioning with HRQoL, depression, and anxiety, correlation analyses were planned. Linear regression was utilized to examine the primary study hypotheses related to the effects of stigma, avoidant coping, and social functioning on each of the outcome variables, HRQoL, depression, and anxiety. The interaction effect of avoidance and stigma on each outcome variable was assessed using hierarchical linear regression; to reduce collinearity, stigma and avoidant coping were centered. Then, a cross product was calculated to represent the interaction term. The centered variables were entered into the first block, followed by the interaction term in the second block.

The data set ($n = 193$) was assessed for the assumptions of linear regression. The assumption of normality was assessed using two means, statistical methods (Shapiro-Wilk test), and visual methods (histograms, boxplots). The assumptions of linearity and homoscedasticity were assessed using visual inspection of scatter plots. Durbin-Watson score was utilized to assess the assumption of independence. Multicollinearity was assessed for with tolerance and VIF scores.
Assumptions of correlation were also assessed. Variables assessed were continuous and paired. Outliers and linearity were assessed using scatterplots. The assumption of normality was assessed using the Shapiro-Wilk test.

Data were excluded from final calculations if standardized $z$-scores on any measure exceeded the cutoff of $z = 2.58$ ($\alpha = .01$). This alpha level was selected to retain enough participants for optimal statistical power, while also eliminating obvious outliers.
RESULTS

A total of 193 participants were included in the final data set. Six participants were excluded, as they exhibited scores determined to be univariate outliers on differing measures. Univariate outliers are defined above as a standardized score on any measure exceeding $z = 2.58$ ($\alpha = .01$).

**Relationships of Stigma, Avoidance, and Social Functioning and Health-Related Quality of Life.**

Bivariate correlation analyses were conducted to examine the relationships between stigma, avoidance, social functioning, and HRQoL. These analyses revealed that the hypothesized relationships between these variables were partially supported. Specifically, stigma ($M = 18.64$, $SD = 7.01$) was significantly correlated with avoidance ($M = 27.98$, $SD = 9.03$), $r = .53$, $p < .001$, such that more severe experiences with stigma were associated with a stronger avoidant coping style. Stigma and social support ($M = 57.97$, $SD = 14.74$) were not significantly correlated, $r = -.10$, $p = .172$, suggesting no relation between stigma experiences and social support. Avoidance and social support were also not significantly correlated, $r = -.12$, $p = .085$. Therefore, those with a stronger avoidant coping style did not report weaker social support. Stigma ($r = .65$, $p < .001$) and avoidant coping style ($r = .58$, $p < .001$) were also correlated with HRQoL ($M = 46.85$, $SD = 14.49$). Suggesting that stigmatizing experiences and avoidant coping style...
were related to decreased HRQoL. Social support was not significantly correlated with HRQoL, \( r = -.00, p = .983 \). See Table 10 for details of correlation analyses.

**Table 10.** Means, Standard Deviations, and Correlations Between Primary Study Variables in Study 2 (\( n = 193 \))

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: AAQ-II</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2: IIRS</td>
<td>.58***</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3: SSCI-8</td>
<td>.53***</td>
<td>.65***</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4: MSPSS</td>
<td>-.12</td>
<td>-.00</td>
<td>-.10</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5: CESD-10</td>
<td>.65***</td>
<td>.52***</td>
<td>.48***</td>
<td>-.28***</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>6: GAD-7</td>
<td>.59***</td>
<td>.42***</td>
<td>.38***</td>
<td>-.13</td>
<td>.76***</td>
<td>---</td>
</tr>
</tbody>
</table>

\( * * * p < .001 \)

Note. AAQ-II – Acceptance and Action Questionnaire – II; IIRS – Illness Intrusiveness Rating Scale; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item; MSPSS – Multidimensional Scale of Perceived Social Support; CESD-10 – Center for Epidemiological Studies of Depression Short Form; GAD-7 – Generalized Anxiety Disorder Scale 7-Item

To further analyze the relationships between the predictor variables and the outcome, HRQoL, regression analyses were performed. Prior to completing the analysis, data were examined for univariate and bivariate outliers, as well as the assumptions of regression. Initial analyses revealed no violations.

Results of the multiple regression revealed support for the hypothesis that a significant relationship would be found between stigma, avoidant means of coping, and social support with HRQoL. Specifically, the overall model with all variables entered was significant, \( R^2 = .51, F(3, 189) = 64.36, p < .001 \). Examination of the individual variables revealed that stigma (\( \beta = .47, p < .001 \)) and avoidant coping (\( \beta = .35, p < .001 \)) significantly predicted HRQoL, but social support (\( \beta = .09, p = .090 \)) did not. See Table 11 for specifics of regression analyses.
The hypothesis that the interaction of stigmatization and avoidant coping style would also predict HRQoL was not supported. Results suggest there is no differential effect of experiencing both more severe stigmatization and having a stronger avoidant coping style on HRQoL than experiencing only one of these predictors. See Table 12 for specifics of hierarchical regression analysis examining the hypothesized moderative effect of avoidant coping on the relationship between stigma and HRQoL.

Table 11. Regression Analyses Predicting Health-Related Quality of Life (HRQoL) in Study 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAQ-II</td>
<td>.35</td>
<td>5.72</td>
<td>&lt;.001</td>
<td>.51</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.47</td>
<td>7.79</td>
<td>&lt;.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSPSS</td>
<td>.09</td>
<td>1.70</td>
<td>.090</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item; MSPSS – Multidimensional Scale of Perceived Social Support

Table 12. Regression Analyses Predicting Health-Related Quality of Life (HRQoL) from Stigma x Avoidant Coping Interaction in Study 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.71</td>
<td>.50</td>
<td>.50</td>
</tr>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.34</td>
<td>5.57</td>
<td>&lt;.001</td>
<td>.50</td>
<td>.50</td>
<td>.50</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.47</td>
<td>7.69</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td>.71</td>
<td>.51</td>
<td>.01</td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.30</td>
<td>4.58</td>
<td>&lt;.001</td>
<td>.51</td>
<td>.51</td>
<td>.01</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.49</td>
<td>7.93</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQxSSCI</td>
<td>-.10</td>
<td>-1.81</td>
<td>.071</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item
**Relationships of Stigma, Avoidance, and Social Functioning and Depression.**

Bivariate correlation analyses were conducted to examine the relationships between stigma, avoidant coping, social functioning, and depression; these analyses revealed that the hypothesized relationships between these variables were partially supported. Specifically, stigma ($M = 18.64, SD = 7.01$) was significantly correlated with avoidance ($M = 27.98, SD = 9.03$), $r = .53, p < .001$, such that more severe experiences with stigma were associated with a stronger avoidant coping style. Stigma and social support ($M = 57.97, SD = 14.74$) were not significantly correlated, $r = -.10, p = .172$, suggesting no relation between stigma experiences and poor social support. Avoidance and social support were also not significantly correlated, $r = -.12, p = .085$. Therefore, those with a stronger avoidant coping style did not report weaker social support. Stigma ($r = .48, p < .001$), avoidant coping style ($r = .65, p < .001$), and social support ($r = -.28, p < .001$) were also correlated with depression ($M = 12.33, SD = 6.15$). Such results suggest that stigmatizing experiences, avoidant coping style, and poor social support were related to increased depressive symptoms. See Table 10 for details of correlation analyses in Study 2.

To further analyze the relationships between the predictor variables and the outcome, depression, regression analyses were performed. Prior to completing the analysis, data were examined for univariate and bivariate outliers, as well as the assumptions of regression. Initial analyses revealed no violations. Results of the multiple regression revealed support for the hypothesis. Specifically, the overall model with all variables entered was significant, $R^2 = .49, F(3, 189) = 59.70, p < .001$. Examination of
the individual variables revealed that stigma ($\beta = .17, p = .005$), avoidant coping ($\beta = .53, p < .001$), and social support ($\beta = -.20, p < .001$) significantly predicted depression. See Table 13 for specifics of regression analyses.

**Table 13. Regression Analyses Predicting Depression in Study 2**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAQ-II</td>
<td>.53</td>
<td>8.65</td>
<td>&lt; .001</td>
<td>.49</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.17</td>
<td>2.84</td>
<td>.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSPSS</td>
<td>-.20</td>
<td>-3.79</td>
<td>&lt; .001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item; MSPSS – Multidimensional Scale of Perceived Social Support

The hypothesis that the interaction of stigmatization and avoidant coping style would also predict depression was not supported. Results suggest there is no differential effect of experiencing both more severe stigmatization and having a stronger avoidant coping style on depressive symptoms. See Table 14 for details of the hierarchical regression analysis investigating a hypothesized interaction of stigma and avoidant coping on depressive symptoms, with avoidant coping serving as a moderator of the relationship.
Table 14. Regression Analyses Predicting Depression from Stigma x Avoidant Coping Interaction in Study 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.55</td>
<td>8.70</td>
<td>&lt; .001</td>
<td>.67</td>
<td>.45</td>
<td>.45</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.18</td>
<td>2.89</td>
<td>.004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.52</td>
<td>7.67</td>
<td>&lt; .001</td>
<td>.67</td>
<td>.45</td>
<td>.01</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.20</td>
<td>3.08</td>
<td>.002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQxSSCI</td>
<td>-.08</td>
<td>-1.32</td>
<td>.188</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item

Relationships of Stigma, Avoidance, and Social Functioning and Anxiety.

Correlation analyses conducted to examine the relationships between stigma, avoidance, social functioning, and anxiety revealed that the hypothesized relationships between these variables were partially supported. Specifically, stigma ($M = 18.64, SD = 7.01$) was significantly correlated with avoidance ($M = 27.98, SD = 9.03$), $r = .53, p < .001$, such that more severe experiences with stigma were associated with a stronger avoidant coping style. Stigma and social support ($M = 57.97, SD = 14.74$) were not significantly correlated, $r = -.10, p = .172$, suggesting no relation between stigma experiences and poor social support. Avoidance and social support were also not significantly correlated, $r = -.12, p = .085$. Therefore, those with a stronger avoidant coping style did not report weaker social support. Stigma ($r = .38, p < .001$) and avoidant coping ($r = .59, p < .001$) were significantly correlated with increased anxiety symptoms ($M = 8.58, SD = 5.48$). Social support was not significantly correlated with anxiety.
symptoms, $r = -.13, p = .066$. Stigma and avoidant coping were both related to anxious symptoms such that increased stigmatizing experiences or greater avoidant coping style were related to increased anxiety symptoms. See Table 10 for details of correlational analyses.

To further analyze the relationships between the predictor variables and the outcome, anxiety, regression analyses were performed. As established, analyses revealed no violations to the assumptions of regression. Results of the multiple regression analyses revealed support for the hypothesis. Specifically, the overall model with all variables entered was significant, $R^2 = .36, F(3, 189) = 35.29, p < .001$. Examination of the individual variables revealed that revealed that only avoidant coping ($\beta = .54, p < .001$) significantly predicted anxiety in Study 2; stigma ($\beta = .09, p = .183$) and social support ($\beta = -.06, p = .335$) were not found to be significant predictors of anxiety. See Table 15 for specifics of regression analyses.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>$R^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAQ-II</td>
<td>.54</td>
<td>7.77</td>
<td>&lt; .001</td>
<td>.36</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.09</td>
<td>1.34</td>
<td>.183</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSPSS</td>
<td>-.06</td>
<td>-.97</td>
<td>.335</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item; MSPSS – Multidimensional Scale of Perceived Social Support

The hypothesis that the interaction of stigmatization and avoidant coping style would also predict anxiety symptoms was not supported. Results suggest no differential effect of experiencing both more severe stigmatization and having a stronger avoidant
coping style on anxiety symptoms. See Table 16 for details of the hierarchical regression analysis investigating a hypothesized interaction effect between stigma and avoidant coping on anxious symptoms, with avoidant coping serving as a moderator of the relationship.

**Table 16.** Regression Analyses Predicting Anxiety from Stigma x Avoidant Coping Interaction in Study 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.54</td>
<td>7.88</td>
<td>&lt; .001</td>
<td>.60</td>
<td>.36</td>
<td>.36</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.09</td>
<td>1.38</td>
<td>.171</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQ-II</td>
<td>.54</td>
<td>7.34</td>
<td>&lt; .001</td>
<td>.60</td>
<td>.36</td>
<td>.00</td>
</tr>
<tr>
<td>SSCI-8</td>
<td>.09</td>
<td>1.34</td>
<td>.181</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAQxSSCI</td>
<td>.00</td>
<td>.04</td>
<td>.966</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. AAQ-II – Acceptance and Action Questionnaire II; SSCI-8 – Stigma Scale for Chronic Illnesses 8-Item*
STUDY 2 DISCUSSION

**Health-Related Quality of Life.**

Individual relationships were established between stigma, avoidant coping, and social support, and the outcome, HRQoL. For example, results suggest that as stigmatizing experiences increase, HRQoL decreases. These results are consistent with avoidant coping, as well; greater utilization of avoidant coping is related to decreased HRQoL. Though a relationship between social support and HRQoL was not established, similar to findings displayed in Study 1, social support was significantly related to constructs related to HRQoL, suggesting social support may indirectly influence HRQoL.

Further, individual relationships were established between the predictor variables avoidant coping and stigma, and the outcome, HRQoL. Such results suggest that stigma and avoidant coping were able to significantly predict HRQoL outcomes in Study 2, yet social support was not. These findings largely lend support to hypotheses posited, and further suggest the importance of these variables, both individually and in combination, for understanding the specific HRQoL outcomes of college students with chronic illnesses.

The final hypothesis regarding HRQoL posited an interaction of stigma and avoidant coping, such that HRQoL was lower for those who reported high levels of stigma and also endorsed an avoidant coping style; support for this hypothesis was not
found in Study 2. Though contrary to hypotheses stated, such findings are meaningful in that they suggest there may be other moderating or mediating factors contributing to the relationship between stigma and HRQoL; this conclusion justifies further investigation into other contributing factors.

Together, these findings provide concurrent support for findings in Study 1. Hypotheses were largely supported, impressing the importance of including broader characteristics in the definition of HRQoL. By expanding this definition to include physical and psychological characteristics, broader areas of intervention are highlighted, allowing for long-term improvements and positive HRQoL outcomes in college students with chronic illness.

**Depression.**

As established in Study 1, those with chronic illnesses may be vulnerable to poorer mental health outcomes, though specific contributing factors were previously not well understood. Results from Study 2 describe specific variables that may contribute to poor mental health outcomes. Results suggest that stigma and depression are related, such that increases in stigma result in increased report of depressive symptoms. Further, increased avoidant coping similarly results in increased depressive symptoms. Finally, the relationship between social support and depression was negative, suggesting that decreased support results in greater symptoms of depression.

Results suggest support for the hypothesis stating that stigma, avoidant coping, and social functioning are able to predict depressive symptoms in college students with chronic illness. Discovering this relationship suggests that depressive outcomes can be predicted based on levels of the predictor variables. Consistent with findings with other
outcome variables, these results are significant because they allow for prediction of depressive outcomes based on levels of stigma, avoidant coping, and social support.

Consistent Study 1, results from Study 2 fail to find support for the hypothesis that states there will be an interaction effect of stigmatization and avoidant coping on depression. Depression was not significantly greater in individuals who endorsed experiencing stigmatizing events, as well as coping using avoidant means. Lack of support for this hypothesis suggests that there is no additive effect of experiencing both predictor variables. Thus, as stated previously, factors other than avoidant coping may be contributing to the relationship between stigma and depression.

The hypotheses related to outcomes of depression in chronically-ill college students were largely supported in Study 2, suggesting that college students with chronic illnesses experience depression related to stigmatizing experiences, avoidant means of coping, and poor social support. The research conducted across both studies highlights the prevalence of depression in the chronically-ill undergraduate population, and the vulnerability to many factors contributing to symptoms of depression. While previous research has commented on the incidence of depressive symptoms in this population (Kagee, 2008), this research is the first known to identify specific factors that may contribute to depressive outcomes. Further investigation is warranted into other factors that may contribute to such symptoms in college students with chronic illnesses.

Anxiety.

The first hypothesis related to anxiety describes the significance of relationships between stigma, avoidant coping, and social support. Such relationships were exhibited in
the data between stigma, social support, and avoidant coping with anxiety. These individual relationships suggest that anxious symptoms increase when stigmatization of illness symptoms is experienced, as well as when avoidant coping is utilized. Further, anxious symptoms were found to be related to social support, such that poor social support and functioning was related to greater anxious symptoms. Thus, unique relationships were established between the individual predictors, as well as with anxious symptoms.

Further, analysis of the data largely provided support for the hypothesis stating that a significant relationship would be found between the predictors, stigma, avoidant coping, and social support, and the outcome variable, anxiety. Only avoidant coping was found to be a significant predictor of anxiety symptoms in Study 2. Thus, high levels of avoidant coping resulted in higher levels of anxiety in participants in Study 2, yet stigma and social support were not significant predictors of outcomes.

Finally, consistent with Study 1, the interaction effect hypothesis was not supported. As with HRQoL and depression, the nonsignificant interaction of stigma and avoidant coping on anxiety suggests that there is no difference in anxiety symptoms, regardless of whether one predictor is experienced, or stigma and avoidant coping are experienced in tandem. Other factors may be contributing to this relationship in a moderating or mediating capacity; further investigation into such variables is justified, so as to better understand the relationship between stigma and anxiety in this population.

Support was found in the data for the majority of hypotheses relating to anxiety. These findings suggest that, overall, college students with chronic illness are prone to
experiencing symptoms of anxiety in relation to their chronic illness. Though anxiety is a normal accompaniment to many everyday life experiences, chronically-ill individuals appear to have an increased vulnerability to experiencing anxiety related to many aspects of their everyday lives, and thus have more negative experiences associated with their illness and HRQoL. Such findings are especially relevant, as previous research has suggested poor mental health being implicated in the worsening of chronic illnesses (Clarke & Currie, 2009). An increased understanding of the factors that contribute to symptoms of anxiety in this population have the potential to improve chronic symptom outcomes.

**Study 2 Conclusions.**

The results of Study 2 largely provide support for the hypothesized relationships between predictor variables and HRQoL, depression, and anxiety. These results are critical, as they provide support for Aaronson’s 1988 article discussing the importance of recognizing characteristics that contribute to HRQoL. As seen in the research described here, HRQoL was significantly related to stigmatization of chronic illnesses, avoidant coping, and poor social support. As Aaronson (1988) states, when defining HRQoL, physiological and psychological components should be included in the definition as contributing factors. The research conducted supports this hypothesis, as well as establishes new relationships between these variables that were previously unknown.

General results of Study 2 provided that the outcome variables of poor HRQoL, depression, and anxiety are meaningfully related to illness-related stigma, avoidant coping, and poor social support. Further, stigma, avoidant coping, and social support are
able to predict HRQoL, depression, and anxiety outcomes in the population of undergraduate college students with chronic illnesses. These results are consistent with findings in Study 1, and largely provide support for hypotheses posited.

Understanding the impact of stigmatizing experiences, avoidant coping means, and poor social support allow for increased opportunities for intervention. Increasing avenues for intervention allows for the promotion of positive outcomes in college students with chronic illnesses. For example, in mental health treatment, these specific factors can be targeted to decrease symptoms of depression and anxiety. Further, for medical professionals, lack of patient improvement may be associated with poor mental health related to these predictive factors. Thus, results of Study 2 allow the potential for positive outcomes through increased understanding of the relationships between predictor and outcome variables.
GENERAL DISCUSSION

The studies described were conducted to examine the effects of illness-related stigma, avoidant coping style, and social support on the HRQoL, depression, and anxiety of chronically-ill college students; these factors were previously unstudied in combination. Across both studies, results provided evidence that outcomes of HRQoL, depression, and anxiety were poor for college students with chronic illnesses who endorsed experiencing stigmatization, avoidant coping, and poor social functioning. Such findings reveal previously unstudied components of poor psychological and HRQoL outcomes for college students with chronic illnesses; results are especially meaningful, as they were exhibited across two studies. Further, the ability of stigma, avoidant coping, and social support to serve as predictors for the outcomes of HRQoL, depression, and anxiety suggest that outcomes are contingent on the stigmatizing experiences, avoidant style of coping, and level of social support that these college students have. In sum, college students with chronic illness have special vulnerabilities to their HRQoL and two facets of mental health based on factors considered to be associated with the chronic disease course.

Hypotheses across studies posited individual relationships would exist between variables, that the predictor variables of stigma, avoidant coping style, and social support would predict HRQoL, depression, and anxiety, and that an interactive effect of stigma
and avoidant coping would result in worsened outcome variables. Such hypotheses were formed based on existing research that suggests symptoms of major chronic illnesses are related to diagnoses of depression and anxiety (Katon, Lin, & Kroenke, 2007), and that a large proportion of those with chronic illnesses endorse symptoms of depression and anxiety (Kagee, 2008). Further, stigmatization associated with chronic illness symptoms related to increased depressive and anxious symptoms (Gupta, Gupta, & Watteel, 1998), and theories on the behavioral and physical consequences of avoidant coping (Bond et al., 2011; McCracken, 1998) laid a groundwork for the research conducted. The existing literature describes a number of associations between chronic illnesses and poor mental health outcomes, and provided evidence for a linkage of constructs, resulting in the research described here.

Findings across both studies provide support for two of the three main hypotheses proposed, suggesting that scores on measures of depression and anxiety were higher, and scores on the HRQoL measure were lower, for those participants who endorsed experiencing stigma, avoidant coping, and/or poor social support. This is consistent with conclusions from Gupta, Gupta, and Watteel (1998), providing support that stigmatization of chronic symptoms is a predictor of increased symptoms of depression, as well as with Kagee’s (2008) findings of the linkage between chronic illness and reported symptoms of depression and anxiety. Thus, while stigmatization may be evolutionarily beneficial for those enacting it, it appears to be related to both depression and anxiety, as seen here, as well as poor overall health outcomes in those undergraduate students with chronic illnesses (Eisenberg, Downs, Golberstein, & Zivin, 2009).
As established, the research conducted supports Aaronson’s 1988 hypothesis that quality of life should include factors related to physical and psychological functioning. Though Aaronson’s statements are dated, they are relevant to the research at hand, largely because they express the importance of inclusion of biological and psychological functioning, beyond perceived satisfaction with one’s life. Further, such findings lend support to Herts, Wallis, & Maslow’s (2014) conclusions that in HRQoL in college freshmen with chronic illnesses is diminished. The support for hypotheses related to HRQoL across both studies provides evidence for high intrusiveness of illness (Devins, 2010) on the lifestyles of college students with chronic illness, and suggest many routes for intervention to promote positive outcomes in these undergraduates. Among these routes include social support, coping style, and stigmatization of symptoms.

In sum, the majority of hypotheses in this study were supported. Results overall suggest associations between predictor and outcome variables, and suggest a number of relationships between variables that result in negative outcomes for undergraduate students with chronic illness. These findings highlight a number of implications for public health and for universities, who must rise to meet the specific needs of these students.

**Null Interaction Effect Findings**

The interaction effects hypothesized in Studies 1 and 2 were not found. These nonsignificant findings for the interaction of stigma and avoidant coping provide evidence that depression, anxiety, and HRQoL was not significantly worse for those participants who endorsed high levels of both stigmatizing experiences and avoidant
coping style. Ultimately, findings suggest there was no differential effect of experiencing both more severe stigmatization and having a stronger avoidant coping style on HRQoL and depressive and anxious symptoms.

These findings suggest that avoidant coping style did not moderate the relationship between stigmatizing experiences and any of the outcome variables, as hypothesized. Such findings suggest that either the relationship between stigma and the outcome variables is not vulnerable to influence from avoidant coping, or that there may be a different variable influencing the relationship between stigma and the outcome variables. Further research could investigate specific factors that contribute to the nonsignificant interaction effect found across both studies; for example, it can be hypothesized that social support may serve as a moderator over the relationship, such that increased social support mediates the negative effects of stigmatizing experiences. Thus, further investigation into differentiating factors that may moderate or mediate the relationship is warranted.

**Implications for Universities**

The research conducted highlights a number of implications relevant to undergraduate university settings. Findings ultimately suggest that college students afflicted with chronic illness face a number of obstacles to both their personal development, in regards to diminished HRQoL and increased depression and anxiety during a critical developmental period. Universities must be aware of such obstacles in order to better meet the needs of their chronically-ill student body; this is especially true in light of the findings of the current study, as previous research has suggested a link
between poor mental health and increased likelihood of dropping out of college in certain populations (Boyraz, Horne, Owens, & Armstrong, 2016).

Reducing stigmatization of chronic illnesses is an area of intervention that may promote positive outcomes for students with chronic illness. Throughout the study, stigmatization of chronic symptoms was linked to poor HRQoL and mental health outcomes. Through reduction in stigmatization and normalization of such symptoms at the university-wide level, outcomes for students with chronic illnesses are hypothesized to be more positive.

Further, in light of the research described, university health and counseling centers have a responsibility to provide services targeting specific components of the chronic illness course identified here. Impressing the importance of positive coping skills for these students is hypothesized to be equally beneficial to promoting positive outcomes. University health and counseling centers should work to understand and convey to students the importance of coping with illness symptoms in a positive, confronting manner as a way of mediating poor mental health outcomes (Bettis et al., 2017). Promotion of support groups for students afflicted with chronic symptoms may be beneficial for these students, as well, as they could experience positive social support in a non-stigmatizing environment with individuals who can identify with the challenges they face. Through this, illness-related anxiety and depression, as well as HRQoL, may be improved.

To promote the success and retention of their students with chronic illnesses, universities must take steps to understand the challenges these students overcome to lead
normal lifestyles. Reduction in the stigmatization of chronic illnesses, as well as increased psychological support and treatment, may help universities to promote positive psychological and HRQoL outcomes for their undergraduate students.

**Public Health Considerations**

As members of the general population, the findings described here for college students have noteworthy implications for public health. Mental health treatment results in significant costs to the public every year (Roehrig, 2016). Not only do these students accrue medical costs associated with having chronic illness, but poor mental health in this population can contribute to financial burden for the public, with mental health being the costliest illness for taxpayers, exceeding expenditures of $201 billion per year in the United States alone. Thus, increasing understanding of factors that contribute to depressive and anxious symptoms in individuals with chronic illness has the potential to decrease public costs associated with mental health care.

At the medical level, comorbidities of depression and anxiety should be considered in students with chronic illnesses. If an undergraduate student with an illness presents and symptoms are worsening, exploration into peripheral aspects of the disease course, like stigmatization, avoidant means of coping with symptoms, and poor social support may be beneficial. At the psychological level, treatment of depression and/or anxiety in a college student client with chronic illness should also involve delving into areas related to coping, experienced stigma, and social support.

The current research highlights a number of implications for public health for undergraduates with chronic illness. Based on the evidence provided, addressing
decreased HRQoL and increased symptoms of depression and anxiety in this population has the potential to lower health costs to the public, as well as promote more positive HRQoL, depression and anxiety, and physical outcomes for college students with chronic illness. Further, the research described outlines a number of areas for intervention to promote positive outcomes in this population, as well as highlights reasoning behind worsening outcomes. Thus, this population and factors contributing to negative outcomes warrant address from public health outlets.

Limitations and Future Directions

The limitations associated with this research provide a number of areas for future investigation. The first of these involves methods of sampling. While utilization of mTurk is supported by research to provide a representative sample, is relatively affordable, and is time-efficient, the survey uploaded was open to all individuals enrolled as responders on mTurk. Thus, there is no way to verify whether or not participants were current college students, or to validate whether or not they had been diagnosed with chronic illnesses. Though mTurk provides the option of setting specific parameters that participants must meet before being offered the survey, these qualifications were not financially viable, nor were they specific enough for the research conducted (e.g., could not specific demographic group of college students, only broad age range). Thus, the anonymity of responses limits understanding of whether or not they come from college students with chronic illnesses.

To improve the validity of findings, examining stigmatizing experiences specifically on college campuses is a first step for future research. While the original
study was prepared to examine outcomes in this population, low participation limited conclusions that could be drawn. Provision of incentives for undergraduate participation may draw more participants and allow for better insights into the experiences of these students. Providing the opportunity to participate at a different time in the academic year may result in increased participation. Collecting a sample from a college campus is more likely to draw current college students with chronic illnesses and provide greater insight into these students’ experiences.

The use of the Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet, & Farley, 1988) is also considered a limitation of this study. For example, in Study 2, neither of the other predictor variables were found to be significantly correlated to the MSPSS. Further, correlations with other variables were weak throughout the study, in comparison with relationships between other variables. It can be hypothesized that, since this measure taps general social support, but not necessarily in the way that college students interact and feel support (i.e., through technology or social media), we are not measuring how students feel support in a modern context. Thus, in future research, an updated measure of social interaction and support is hypothesized to provide findings of greater significance.

Relatedly, findings described here are only applicable to college students. While this is beneficial for promoting positive outcomes for this population, other groups are hypothesized to experience stigma related to their chronic symptoms (McGonagle & Barnes-Farrell, 2013; Markle, Attell, & Triber, 2015). Expansion of the study to other populations may provide evidence as to whether stigmatization of chronic illnesses is
characteristic of college students, or may extend to other demographic groups. Extending the survey beyond college students would provide further insight into these experiences at other points of life. For example, investigating illness-related stigma in children and young adults with chronic illness and identifying outcomes in this population may allow for the earlier identification of avoidant coping related to illness symptoms, likely leading to improved outcomes through the teaching of other coping mechanisms. Thus, investigation into other demographic groups is warranted, so as to better promote positive outcomes for those with chronic illness at differing stages of life.

Expanding the current study by utilizing a healthy control group may provide evidence about the differences between undergraduate students with chronic illnesses and their healthy peers. The current study did not utilize a control group, as the primary goal was to understand simple relationships between stigma, avoidant coping, and social support on HRQoL, depression, and anxiety, not to compare these individuals with healthy undergraduates. However, future research could utilize a healthy, matched control group in order to better understand specific differences between chronically-ill college students and their healthy counterparts.

Though specific illnesses were not analyzed in the studies described here, further investigation into the specifics of illnesses individuals are afflicted with appears warranted. As previous research suggests, visibility of chronic conditions to the outside observer results in varying experiences of stigma (Ginbsurg & Link, 1993). In the future, assessing the visibility of the illnesses that each individual is diagnosed with may provide deeper insight into the stigmatization that accompanies chronic illnesses.
Finally, the study conducted highlighted specific factors that may contribute to poor outcomes in college students with chronic illnesses. Based on these findings, development of an acceptance-based treatment approach for college students with chronic illnesses, specifically targeting avoidant methods of coping to reduce illness-related depression and anxiety and HRQoL symptoms, is another possible direction of future research. As understood from the research described here, as well as research by Bombardier, D’Amico, and Jordan (1990) and Eisenberg, Shen, Schwarz, and Mallon (2010), avoidant means of coping are suggested to be associated with poor physical and mental health outcomes in individuals with chronic conditions. An acceptance-based intervention could be utilized specifically by university counseling centers and psychologists working with college student populations to treat depression and anxiety in undergraduates with chronic illnesses. By identifying and specifically treating factors that contribute to illness-related depression and anxiety, with a special attention on avoidant means of coping, the efficacy of treatment can be improved for the college student population.

Final Conclusions

In sum, the results of the study provide evidence that stigma, avoidant coping, and social support are related to poor mental health and HRQoL outcomes in college students with chronic illness. This study serves as the first known to examine stigma, avoidant coping, and social support as predictors of poor outcomes in a sample with chronic illness. Though the results are accompanied with a number of limitations, conclusions are supported by findings across two studies. Results of this study are impactful for
undergraduate students, universities, and the general public, alike. With increased awareness of factors contributing to poor mental health and HRQoL in this population, outcomes can be improved.
REFERENCES


78
skills. *Journal of American College Health, 65*, 313-322. doi:
10.1080/07448481.2017.1312411


10.1016/j.beth.2011.03.007


APPENDIX A

DEMOGRAPHICS QUESTIONNAIRE FOR PARTICIPANTS RECRUITED ON CAMPUS IN STUDY 1.

Participant instructions: “We'd like to know a little more about you. Please answer the following questions before moving on to the next part of the survey. If you feel that your response(s) may make you identifiable, please omit your response(s) to any of the following items.”

1. What is your age (in years)? ________
2. What is your gender?
   Male
   Female
   Unspecified
3. How do you describe your racial/ethnic identity? (e.g., Caucasian, African American)
   ________
4. Current Education Level
   College freshman
   College sophomore
   College junior
   College senior
   I am not in college.
5. Are you a part-time or full-time student?
   Part-time
   Full-time
6. Employment status
   Unemployed
   Part-Time
   Full-Time

7. Family Annual Income
   $0 - $25,000
   $25,000 - $50,000
   $50,000 - $75,000
   $75,000 - $100,000
   $100,000+

8. How many chronic illnesses have you been diagnosed with?
   0
   1
   2
   More than 2

9. How long have you had your chronic illness?
   0-6 months
   12-18 months
   18-24 months
   24+ months

10. Which category of chronic illness do you experience? Select all that apply.
    Cardiovascular (e.g., heart disease, high blood pressure, heart palpitations)
    Pain (e.g., chronic pain, orthopedic injury)
    Sensory impairment (visual/auditory)
    Respiratory (e.g., asthma, cystic fibrosis)
    Immune (e.g., HIV/AIDS, rheumatoid arthritis, lupus, multiple sclerosis, Type 1 diabetes, psoriasis, Celiac’s)
    Bowel/Gastroenterological (e.g., Crohn’s, inflammatory bowel disease, irritable bowel syndrome, ulcerative colitis)
    Neurological (e.g., epilepsy, chronic migraines)
    Renal (e.g., kidney disease, kidney stones)
Infectious (e.g., Lyme disease)
Sleep (e.g., narcolepsy, sleep apnea)
Thyroid (e.g., hyperthyroidism, hypothyroidism)
Other (please describe)

11. How were you invited to participate?
   In an email from the graduate student investigator
   In an email from a friend
APPENDIX B

DEMOGRAPHICS QUESTIONNAIRE FOR PARTICIPANTS RECRUITED THROUGH MTURK IN STUDY 1.

Participant instructions: “We'd like to know a little more about you. Please answer the following questions before moving on to the next part of the survey. If you feel that your response(s) may make you identifiable, please omit your response(s) to any of the following items.”

1. What is your age (in years)? ________
2. What is your gender?
   Male
   Female
   Unspecified
3. How do you describe your racial/ethnic identity? (e.g., Caucasian, African American) ________
4. Current Education Level
   College freshman
   College sophomore
   College junior
   College senior
   I am not in college.
5. Are you a part-time or full-time student?
   Part-time
   Full-time
6. Employment status
   Unemployed
   Part-Time
   Full-Time

7. Family Annual Income
   $0 - $25,000
   $25,000 - $50,000
   $50,000 - $75,000
   $75,000 - $100,000
   $100,000+

8. How many chronic illnesses have you been diagnosed with?
   0
   1
   2
   More than 2

9. How long have you had your chronic illness?
   0-6 months
   12-18 months
   18-24 months
   24+ months

10. Which category of chronic illness do you experience? Select all that apply.
    Cardiovascular (e.g., heart disease, high blood pressure, heart palpitations)
    Pain (e.g., chronic pain, orthopedic injury)
    Sensory impairment (visual/auditory)
    Respiratory (e.g., asthma, cystic fibrosis)
    Immune (e.g., HIV/AIDS, rheumatoid arthritis, lupus, multiple sclerosis, Type 1 diabetes, psoriasis, Celiac’s)
    Bowel/Gastroenterological (e.g., Crohn’s, inflammatory bowel disease, irritable bowel syndrome, ulcerative colitis)
    Neurological (e.g., epilepsy, chronic migraines)
    Renal (e.g., kidney disease, kidney stones)
Infectious (e.g., Lyme disease)
Sleep (e.g., narcolepsy, sleep apnea)
Thyroid (e.g., hyperthyroidism, hypothyroidism)
Other (please describe)
APPENDIX C

DEMOGRAPHICS QUESTIONNAIRE FOR PARTICIPANTS IN STUDY 2.

Participant instructions: “We'd like to know a little more about you. Please answer the following questions before moving on to the next part of the survey. If you feel that your response(s) may make you identifiable, please omit your response(s) to any of the following items.”

1. What is your age (in years)? ________
2. What is your gender?
   Male
   Female
   Unspecified
3. How do you describe your racial/ethnic identity? (e.g., Caucasian, African American) ________
4. Current Education Level
   College freshman
   College sophomore
   College junior
   College senior
   I am not in college.
5. Are you a part-time or full-time student?
   Part-time
   Full-time
   I am not in college.
6. Employment status
   Unemployed
   Part-Time
   Full-Time
7. Family Annual Income
   $0 - $25,000
   $25,000 - $50,000
   $50,000 - $75,000
   $75,000 - $100,000
   $100,00+ 
8. How many chronic illnesses have you been diagnosed with?
   0
   1
   2
   More than 2
9. How long have you had your chronic illness?
   0-6 months
   6-12 months
   12-18 months
   18-24 months
   24+ months
10. Which category of chronic illness do you experience? Select all that apply.
    Cardiovascular (e.g., heart disease, high blood pressure, heart palpitations)
    Pain (e.g., chronic pain, orthopedic injury)
    Sensory impairment (visual/auditory)
    Respiratory (e.g., asthma, cystic fibrosis)
    Immune (e.g., HIV/AIDS, rheumatoid arthritis, lupus, multiple sclerosis, Type 1 diabetes, psoriasis, Celiac’s)
    Bowel/Gastroenterological (e.g., Crohn’s, inflammatory bowel disease, irritable bowel syndrome, ulcerative colitis)
    Neurological (e.g., epilepsy, chronic migraines)
Renal (e.g., kidney disease, kidney stones)
Infectious (e.g., Lyme disease)
Sleep (e.g., narcolepsy, sleep apnea)
Thyroid (e.g., hyperthyroidism, hypothyroidism)
Type 1 Diabetes
Type 2 Diabetes
Other (please describe)
APPENDIX D

BATTERY OF MEASURES USED IN BOTH STUDIES

Acceptance and Action Questionnaire - II. Participant instructions: “Below you will find a number of statements. Please rate how true the statements are for you by selecting the most accurate rating for each.” Response options next to each item: (1) Never true, (2) Very seldom true, (3) Seldom true, (4) Sometimes true, (5) Frequently true, (6) Almost always true, (7) Always true

1. My painful experiences and memories make it difficult for me to live a life that I would value
2. I’m afraid of my feelings
3. I worry about not being able to control my worries and feelings
4. My painful memories prevent me from having a fulfilling life
5. Emotions cause problems in my life
6. It seems like most people are handling their lives better than I am
7. Worries get in the way of my success

Illness Intrusiveness Rating Scale. Participant instructions: “The following items ask about how much your illness and/or its treatment interfere with different aspects of your life. Please select the number that best describes your current life situation. If an item is not applicable, please select the number one (1) to indicate that this aspect of your life is
not affected very much.” Response options next to each item: (1) Not very much, (2), (3), (4), (5), (6), (7) Very much

How much does your illness and/or its treatment interfere with your:

1. Health
2. Diet
3. Work
4. Active Recreation (e.g., sports)
5. Passive Recreation (e.g., reading, listening to music)
6. Financial Situation
7. Relationship with Your Significant Other (e.g., girlfriend, boyfriend, spouse, partner)
8. Sex Life
9. Family Relations
10. Other Social Relations
11. Self-Expression/Self-Improvement
12. Religious Expression
13. Civic and Community Involvement

Stigma Scale for Chronic Illnesses 8-Item Version. Participant instructions: “Below you will find a number of statements. Please rate how true the statements are for you by selecting the most accurate rating.” Response options next to each item: (1) Never, (2) Rarely, (3) Sometimes, (4) Often, (5) Always

1. Because of my illness, some people seemed uncomfortable with me
2. Because of my illness, some people avoided me
3. Because of my illness, I felt left out of things
4. Because of my illness, people were unkind to me
5. Because of my illness, people avoided looking at me
6. I felt embarrassed about my illness
7. I felt embarrassed because of my physical limitations
8. Some people acted as though it was my fault I have this illness

**Multidimensional Scale of Perceived Social Support.** Participant instructions: “Below you will find a number of statements. Please rate how true the statements are for you by selecting the most accurate rating.” Response options next to each item: (1) Very Strongly Disagree, (2), (3), (4), (5), (6), (7) Very Strongly Agree

1. There is a special person who is around when I am in need.
2. There is a special person with whom I can share my joys and sorrows.
3. My family really tries to help me.
4. I get the emotional help and support I need from my family.
5. I have a special person who is a real source of comfort to me.
6. My friends really try to help me.
7. I can count on my friends when things go wrong.
8. I can talk about my problems with my family.
9. I have friends with whom I can share my joys and sorrows.
10. There is a special person in my life who cares about my feelings.
11. My family is willing to help me make decisions.
12. I can talk about my problems with my friends.

**CESD-10.** Participant instructions: “Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the past week by selecting the appropriate rating for each question.” Response options next to each item: Rarely or None of the Time (Less than 1 day) Some or a Little of the Time (1-2 days) Occasionally or a Moderate Amount of the Time (3-4 days) Most or All of the Time (5-7 days)
1. I was bothered by things that usually don't bother me.
2. I had trouble keeping my mind on what I was doing.
3. I felt depressed.
4. I felt that everything I did was an effort.
5. I felt hopeful about the future.
6. I felt fearful.
7. My sleep was restless.
8. I was happy.
9. I felt lonely.
10. I could not "get going."

**GAD-7.** Participant instructions “Below you will find a number of statements about ways you may have felt or behaved. Please indicate how often you have felt this way during the past two weeks by selecting the appropriate rating. Over the last 2 weeks, how often have you been bothered by the following problems? Select the appropriate rating.” Response options next to each item: (0) Not at all, (1) Several days, (2) More than half the days, (3) Nearly every day

1. Feeling nervous, anxious or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things
4. Trouble relaxing
5. Being so restless that it is hard to sit still
6. Becoming easily annoyed or irritable
7. Feeling afraid as if something awful might happen