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Academic and Mental Health Functioning in College Students with Chronic Medical Conditions

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Abstract

As medical technologies continue to improve, what used to be considered terminal illnesses are now becoming chronic medical conditions. Studies have consistently shown that children and adolescents with chronic illnesses are more absent from school than their healthy peers (Fowler, Davenport, & Garg, 1992; Taras & Potts-Datema, 2005), and perform poorly in school despite having equitable intelligence levels (Sexson & Madan-Swain, 1993). However, despite thorough documentation of this phenomenon in younger children, there is a lack of research on the effects of chronic illness among college students. The aim of this study was to examine the impact of chronic illness on academic performance, mental health, and quality of life among this understudied population. A total of 209 participants completed a questionnaire that included a variety of measures assessing academic attendance and performance, health, mental health, and past illnesses. It was hypothesized that participants with chronic conditions would demonstrate lower rates of school attendance and academic performance, and higher rates of mental health problems compared to their healthy peers. Although results did not show a statistically significant difference in academic functioning between the two groups, they did reveal that students with chronic medical conditions had significantly higher levels of depression and anxiety, and lower perceived coping ability than their typically-developing peers.

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Chapter 1
Introduction

As medical technologies continue to improve, what used to be considered terminal illnesses are now viewed as chronic medical conditions. An estimated 15-18% of children are living with at least one chronic medical condition, a number that is increasing annually (Anderson & Horvath, 2004; Perrin, Bloom, & Gortmaker, 2007). These diseases, including asthma, diabetes, and autoimmune diseases, account for 78% of health care spending (Anderson & Horvath, 2004) and are a burden not only to society as a whole, but to the individuals affected. Chronic conditions influence many aspects of everyday functioning, interfering with participation in physical activities, family activities, schoolwork, and activities with friends (Sawyer et al., 2004). This interference has both short- and long-term ramifications. Studies have consistently shown that children and adolescents with chronic illnesses are at higher risk for a variety of behavior problems, especially internalizing problems like depression and social withdrawal (Pinquart & Shen, 2010). In addition, these youth also show higher levels of psychiatric disorders and health risk behaviors such as smoking daily (Hysing, Elgen, & Lundervold, 2009; Suris, Michaed, Akre, & Sawyer, 2008). School functioning is one of the most affected domains of these children's lives. School-age children with chronic conditions have been consistently shown to

experience more frequent school absences than their healthy peers (Fowler, Davenport, & Garg, 1992; Logan, Simons, Stein, & Chastain, 2008; Sexson & Madan-Swain, 1993; Taras & Potts-Datema, 2005; Weitzman, 1986) and perform more poorly in school despite having equitable intelligence levels (Sexson & Madan-Swain, 1993).

Despite documentation of difficulties faced by younger children, there is a lack of research on the effects of chronic illness on college students. In this study, I examined the impact of chronic illness on academic performance, mental health, and quality of life among this understudied population. What follows is an in-depth look at the literature addressing chronic medical conditions, beginning with the epidemiology. Next, I review what is known about the impact of these conditions on school functioning, specifically attendance and performance. Following this literature review, I present the methods and results of the current study, in which I hypothesized that participants with chronic conditions would demonstrate lower rates of school attendance and performance and higher rates of mental health problems. I conclude with a discussion of the implications of these findings and directions for future research.

Chronic Medical Conditions: Epidemiology

According to the National Health Interview Survey, in 1995 between 15-18% of children and adolescents had some chronic medical condition (Perrin, Bloom, & Gortmaker, 2007), and previous studies have shown that 70% of these children had only one condition, while 21% had two, and 9% had three or more (Newacheck & Taylor, 1992). Furthermore, the prevalence of chronic conditions

only increases with age. In 2000, 45% of working age Americans had one chronic condition, and 21% had multiple chronic conditions (Anderson & Horvath, 2004). Comorbidities also increase with age (Anderson & Horvath, 2004). Due to advances in health care, these rates are increasing as conditions that were once fatal now have treatment options (Anderson & Horvath, 2004; Newacheck & Taylor, 1992). In fact, chronic illness has replaced acute illness as the most serious issue in pediatric medicine (Boice, 1998). Whites appear to be the most affected by chronic disease, followed by African Americans and then other races (Anderson & Horvath, 2004). Low income children and adults also have higher rates and severity of chronic conditions (Grant & Brito, 2010).

Asthma is the most common chronic condition in children, affecting 10% in the United States (Boice 1998; Grant & Brito, 2010). According to Newacheck and Taylor, respiratory allergies, frequent/repeated ear infections, eczema and skin allergies, headaches, and speech deficits are also exceedingly common in children (1992). As many as 45,000 children under the age of 15 and 315,000 school children are diagnosed with epilepsy, and both Type 1 and Type 2 diabetes are on the rise (Taras & Potts-Datema, 2005). Sickle cell anemia affects 72,000 Americans directly, mostly African Americans (Taras & Potts-Datema, 2005). Due to the large amount of prevalent diseases diagnosed, it is essential to examine not only those with chronic illness as a whole, but those affected by each individual condition.

The Impact of Chronic Illness

The effects of chronic illnesses are also diverse, depending on the condition and the characteristics of the affected individual. According to Newacheck and Taylor, 22% of children with chronic illness report it bothering them often or all the time, 53% say it is only a bother every once in a while, and 25% claim it is not a bother at all (1992). The same study found that 13% of diagnosed children have some limitations in their daily activities (Newacheck & Taylor, 1992). In many cases, as severity of the condition increases, quality of life decreases, and can lead to depression and anxiety (Grant & Brito, 2010).

As these children approach adolescence, they face a barrage of other problems. Adolescents with chronic illness demonstrate more emotional problems, and have three to four times higher rates of mental health disorders, such as anxiety and depression. (Burns, Sadof, & Kamat, 2006; Michaud, Suris, & Viner, 2007). The normal challenges of adolescence are magnified, as identity and self-image are affected by their illnesses (Boice, 1998; Michaud, Suris, & Viner, 2007). This leads to higher body dissatisfaction and lower self-esteem (Huurre, & Aro, 2002; Michaud, Suris, & Viner, 2007). Adolescents with chronic medical conditions report making friends less easily, consider their future less positively, and attempt suicide more than their healthy peers (Miauton, Narring, & Michaud, 2003). Burns, Sadof, and Kamat (2006) found that these youth have higher rates of unhealthy eating and are more likely to binge eat, purge, or abuse laxatives. Not surprisingly, these youth also partake in more risky behaviors, such as drug and alcohol use and driving under the influence (Miauton, Narring, & Michaud,

2003; Michaud, Suris, & Viner, 2007; Burns, Sadof, & Kamat; 2006). Unfortunately, during this difficult time they are often reluctant to ask for help for fear of not fitting in with their peers (Michaud, Suris, & Viner, 2007). Despite such high frequencies of social and mental health problems, less than 20% receive any professional support (Boice, 1998).

Impact of Chronic Illness on School Performance

Going to school is the "job" and main responsibility of children and adolescents. It is critical that they perform well in academia in order to achieve employment and success in adulthood. Unfortunately, the ability to attend and perform well in school is greatly affected by chronic disease. In a meta-analysis on school reentry, Sexson and Madan-Swain found that 40% of children and adolescents with chronic illness experience school-related problems (1993). This involves problems getting to school, performing in class, and matriculating appropriately. The first two aspects of school functioning, attendance and performance, greatly affect the third, as a deficiency in one will almost inevitably lead to a failure to matriculate.

In general, children with chronic illness have been found to attend less school than their healthy peers (Sexson & Madan-Swain, 1993), and they tend to be sporadic, short absences (Burns, Sadof, & Kamat, 2006). Children with asthma and hemophilia specifically have been observed to miss school more often than those not affected (Fowler 1992; Taras & Potts-Datema, 2005). In a study on children with chronic pain, Logan et al. (2008) found that those affected missed a mean number of 4.5 days in the last school month, as opposed to the full 20

school days they are expected to attend. Furthermore, 57% of school-age children with chronic conditions miss school routinely, and as many as 10% miss more than a quarter of the school year (Burns, Sadof, & Kamat, 2006). These numbers greatly affect academic performance and success in a variety of ways.

The performance of children with chronic medical conditions is significantly lower than their healthy counterparts. For example, children with asthma experience higher grade failure (Fowler, Davenport, & Garg, 1992). Logan et al.'s study on chronic pain found that grades had declined in 44% of the sample since the pain began (2008). The reasons behind these stark differences are plentiful, and must all be addressed when developing interventions and accommodations.

These difficulties in school attendance can be attributed to many factors, including physical disability, decreased mobility, side effects of medication, and necessary health care visits (Sexson & Madan-Swain, 1993). At the most basic level, some chronic conditions impair children's cognitive functioning, which prevents them from succeeding in school without special accommodations. Early onset diabetes is associated with poor cognitive functioning, specifically in deficits in verbal IQ, visuospatial functioning, memory, and attention (Taras & Potts-Datema, 2005). Children with sickle cell anemia show similar difficulties, in addition to problems with language and verbal abilities and "processing of subtle prosody information," especially when in pain (Taras & Potts-Datema, 2005). Children with asthma tend to demonstrate more behavior and attention problems in the classroom (Grant & Brito, 2010), and pain can be a distraction for a child

with any medical condition (Sexson & Madan-Swain, 1993). These conditions can also lead to a variety of symptoms, such as lethargy, nausea, weakness, and fatigue, which can make attending and focusing in class incredibly difficult (Sexson & Madan-Swain, 1993). Additionally, comorbid conditions can contribute to poor performance. Epilepsy, for example is associated with other conditions that affect school functioning, like mental disability and cerebral palsy (Taras & Potts-Datema, 2005). Healthy peers without these conditions do not have to cope with these challenges, and generally face fewer obstacles in the classroom.

The treatment regimens for chronic conditions can also interfere with school performance indirectly. Beyond the illnesses themselves, impairing side effects of medications are common. Medications, such as prescription pills, have been shown to have negative effects on mental functioning (Boice, 1998). These are especially problematic in epilepsy treatment (Taras & Potts-Datema, 2005). Frequent treatment visits are also common and prevent children and adolescents from attending school. Newacheck and Taylor (1992) reported that 690,000 children are hospitalized in the US annually, resulting in a grand total of 7.2 million missed days of school. Children with chronic illnesses average 5 physician contacts daily (Newacheck & Taylor, 1992). Because physicians and other medical professionals tend to work normal business hours, the most convenient appointments often occur when the child should be in school. As a result, a common treatment barrier for families is that they must choose between the treatment and school (Michaud, Suris, & Viner, 2007). Naturally, many

caregivers prioritize medical care, and as a result the child's school attendance declines. This becomes problematic as a child can struggle to keep up with his peers, who attend consistently.

Although all of these side effects of having a chronic medical condition contribute to the problem, they do not fully explain the deficits in school functioning experienced by these children. School absence and performance is not only affected by the illness directly, but many other surprising factors. For example, students with a history of transplant demonstrate lower academic achievement despite having cognitive abilities comparable to their healthy peers (Taras & Potts-Datema, 2005). A wide variety of variables are at play, and these children miss more school than can be attributed to treatment needs (Michaud, Suris, & Viner, 2007). As reported by the World Health Organization, young people with chronic conditions are more likely to skip school (Michaud et al., 2007). Burns (2006) found that 45% of adolescents with chronic illness reported falling behind in school, "leading them to dislike school, with 35% having failing grades". Furthermore, school phobia has a 10% incidence in children with chronic illness, compared to 2% in healthy children (Sexson & Madan-Swain, 1993; Fowler, Davenport, & Garg, 1992).These fears prevent the child from attending school, which greatly affects her ability to keep up with her classmates. The stress associated with keeping up in school on top of coping with a chronic condition has a tremendous effect on academic functioning. Psychological stress can cause a downward spiral and exacerbate the symptoms of many conditions, especially in pediatric asthma (Grant & Brito, 2010; Schneiderman, 2004). Stress causes an

increase in asthmatic symptoms, which increases the likelihood that the child will miss school. In children with arthritis, higher absence is associated with decreased treatment adherence and psychological disturbance (Sexson & Madan-Swain, 1993). This means that there is an interplay between mental health, adherence, and school attendance that is probably affected by several mediating factors. These studies demonstrate how no two children with chronic illness are the same, and a wide variety of influences can affect their school attendance.

Beyond the affected children themselves, teachers can influence academic functioning. Taras and Potts-Datema (2005) found that a majority of teachers expect chronically ill children to experience academic difficulties, which undoubtedly influences their students' beliefs and performance. Teachers also feel inadequate in caring for these children in school (Taras & Potts-Datema, 2005).

The implications of poor academic performance in childhood and adolescents are widespread. Poor academic performance and attendance problems can have lasting effects on children and adolescents into adulthood, including difficulties in securing and maintaining employment (Kashikar-Zuch, Ting, Verkamp, Lynch-Jordan, Passo & Graham, 2010). According to the World Health Organization, "recurrent illness and the demands of treatment regimens may significantly impact upon school attendance and educational achievement, which in turn may result in vocational impairments and loss of financial independence in adult life, (Michaud, Suris, & Viner, 2007). In all populations, healthy and suffering from chronic conditions, lack of education is a major cause of lifetime poverty and poor health (Fennell, Leitz, & Fantauzzi, 2009).

Fortunately, federal legislation guarantees appropriate education for all children, including those diagnosed with a chronic condition (Sexson & Madan-Swain, 1993). However, there is a wide variability in the approaches used by schools and colleges to accommodate students with chronic illness (Fennell et al., 2009). These can include tutoring, extensions on projects, and physical accommodations. In the case of children with chronic pain, for example, around two-thirds receive at least one accommodation, and around one-quarter have an Individualized Education Plan (Logan, Simons, Stein & Chastain, 2008). Although these interventions are appropriate in primary and secondary education settings, they may not fit the specific needs of college students. If the same patterns of poor school attendance and performance are indeed continuing beyond high school, the needs of these affected college students must be investigated in order for appropriate interventions to be developed.

The structure of college classes is markedly different from elementary, middle, and high school. Students, not their parents, are held responsible for getting themselves to class, and much less time is spent there. More is expected to be done on the student's own time than while sitting in lectures. Furthermore, schedules vary from morning to afternoon to evening classes instead of a typical 8-3:30 school day. Because of this increased freedom and more flexible scheduling, even healthy students tend to attend less class than in high school, where skipping or missing "class" would mean being absent for an entire school day. In a review of the literature on college attendance, Crede, Roch, and Kieszczynka (2010) found that average class absenteeism rate estimates range

from 18.5% all the way up to 70% of total classes. These numbers are alarming, especially because attendance rates have been shown to correlate not only with individual class performance, but with GPA as a whole (Crede et al., 2010). In fact, class attendance is more correlated with academic success than SAT score (Crede, Roch, & Kieszczynka, 2010). Therefore, if the pattern of students with chronic conditions missing more school than their healthy peers persists into college, their performance and eventual success could be affected greatly.

Chronic Illness among College Students

As adolescents with chronic illness enter early adulthood, they are potentially faced with the challenge of attending college. The transition to college is a major life adjustment, and is stressful for anyone. Moving away from home, increased independence, making friends, and learning how to manage ones time are all critical aspects of the college experience, and are vital for successful adjustment. While some handle this transition with relative ease, while others are less resilient. According to Kerr, Johnson, Gans, and Krumrine (2004), perceived stress about the transition predicts academic success. Furthermore, the ability to cope with stress and emotions also predicts adjustment (Johnson, Gans, Kerr, & LaValle, 2010).

Young adults entering college with chronic medical conditions have additional challenges in comparison to their healthy peers. There is no standardized protocol for accommodating students with chronic illness (Fennell, Leitz & Fantauzzi, 2009). As a result students with a chronic illness must seek out any services they need on their own. Consistent with research on children and

chronic illnesses, studies involving college students with asthma and allergies have shown an association of illnesses severity with mental health problems and poor academic performance (Molson et al., 2011). Students with asthma demonstrate more anxiety, general psychological distress, and more missed classes when compared to their healthy peers (Carpentier, Mullins & Van Pelt, 2007). Additionally, students with chronic conditions are less likely to graduate college (Maslow et al., 2011).

In general, additional research is needed to clarify the association of chronic illnesses to mental health and academic difficulties among college students. In the present study, a total of 216 college students with and without chronic illnesses were recruited to participate in a survey study that included standardized measures of academic attendance, performance, and mental health status. In the section that follows, the major aims and hypotheses are summarized.

Current Aims

The primary aim of this study was to examine the impact of chronic illness on academic performance, mental health, and quality of life among college students. Despite the extensive literature on all of these domains of functioning in children and adolescents, studies have yet to investigate this understudied population. Therefore, to address this aim the present study analyzed data on 209 male and female college students both with and without chronic illness who filled out a questionnaire involving standardized assessments of school attendance, mental health functioning, and the existence and severity of chronic physical and mental conditions. A participant was considered possessing a chronic medical

condition if he or she endorsed the criteria established by the National Health Interview Survey (Newacheck & Taylor, 1992). By utilizing the similar measures used to evaluate functioning in younger samples, the results of this study will provide useful information on the impact of chronic conditions on the different age groups. Consistent with the research on younger populations (Gorodzinsky, Hainsworth, & Weisman, 2011; Weitzman, 1986), class attendance, academic performance, and standardized measures of quality of life, mental health, and self-perception were collected. Overall, there were two aims of the study: (a) to characterize the prevalence of chronic health conditions in college students; and (b) to analyze the impact of chronic health conditions on the academic and mental health functioning in those affected. The study tested the hypothesis that college students would experience greater academic difficulties and mental health concerns than their healthy peers. These hypotheses are described in more detail as follows.

Primary Research Aims

Aim 1. To clarify whether academic functioning varies as a function of whether a student is experiencing a chronic health condition or not.

Hypothesis 1: Compared to a "healthy" comparison group, students experiencing a chronic health condition will report poorer attendance, as assessed by calculating a percentage of classes missed over the course of the previous month and in the past semester.

Hypothesis 2: Students experiencing a chronic health condition will report lower grade point averages compared to a comparison groups of students without a chronic medical condition.

Hypothesis 3: Students experiencing a chronic health condition would report a greater number of perceived academic difficulties compared to a comparison group of students without a chronic medical condition. Academic difficulties were calculated by totaling the number of 12 perceived obstacles to academic performance endorsed by participants.

Aim 2. To clarifying whether mental health functioning varies as a function of whether a student is experiencing a chronic health condition or not.

Hypothesis 4: Compared to a "healthy" comparison group, students experiencing a chronic health condition will report significantly higher levels of psychological distress, as measured by mean scores on the Brief Symptom Inventory-18 (BSI-18).

Hypothesis 5: Compared to a "healthy" comparison group, students experiencing a chronic health condition will report higher levels of depressive symptomology, as measured by mean scores on the Center for Epidemiologic Studies Depression Scale (CES-D).

Hypothesis 6: Compared to a "healthy" comparison group, students experiencing a chronic health condition will report less confidence in their ability to engage in specific coping behaviors, as measured by the mean scores on the three domains on Coping Self-Efficacy Scale (CSES).

Chapter 2

Methods

Participants

Participants included 209 male and female students. The sample was split between females (N=116, 55%) and males (N=93, 45%) with an average age of 19 (*SD* = 1.07). Participants identified mostly as White/Caucasian (N=116, 56%), followed by Asian/Pacific Islander (N=34, 16%), African American (N=30, 14%), and other (N=12, 6%). The sample was primarily Freshmen (N=154, 74%) followed by Sophomores (N=32, 15%), Juniors (N=15, 7%), and Seniors (N=8, 4%). Most live in dormitories (N=166, 79%), on-campus apartments (N=27, 13%), or off-campus apartments or houses (N=13, 6%).

In terms of school functioning, the sample attended an average of 11.55 class sessions per week, with a minimum of 2 and maximum of 18 for the Spring semester, and mean of 11.4 classes attended for the fall semester (ranged 2 to 20 class attended for the Fall semester). The average GPA was 3.2 (SD= .50) on a 4.0 scale. For a complete summary of the demographic information of the sample, see Table 1.

Table 1
Background Characteristics of Study Participants

N=209			
	Percentage	Mean	Standard Deviation
Gender			
Male	44% (93)		
Female	55% (116)		
Ethnicity			
African American	14% (30)		
White/Caucasian	56%(116)		
Latina	8% (17)		
Asian/Pacific Islander	16% (34)		
Other	6% (12)		
Year at SU			
Freshman	74% (154)		
Sophomore	15% (32)		
Junior	7% (15)		
Senior	4% (8)		
Currently Employed			
No	73% (153)		
Yes	26% (55)		
Sorority/Fraternity Membership			
No	80% (167)		
Yes	19% (40)		
Housing			
Dorm	79% (166)		
Parents' Home	1% (2)		
On-campus apartment	13% (27)		
Sorority/Fraternity House	0.5% (1)		
Off-campus apartment/house	6% (13)		
Sport Membership			
No	90% (189)		
Yes	10% (20)		
Political Party Affiliation			
Democrat	37% (77)		
Independent	11% (68)		
No Affiliation	42% (88)		

Republican	9% (19)		
Green	0.5% (1)		
Other	1% (2)		
Religion			
None	17% (35)		
Catholic	33% (68)		
Jewish	12% (24)		
Islamic	2% (4)		
Hindu	1.4% (3)		
Atheist/Agnostic	8% (17)		
Protestant or other Christian	22% (45)		
Buddhist	2% (5)		
Other	3% (7)		
Parent(s)' Annual Income			
$0-$40,000	4% (9)		
$40,000-$70,000	21% (32)		
$70,000-$100,000	18% (38)		
$100,000-$200,000	24% (50)		
$200,000-$400,000	9% (19)		
$400,000+	7% (14)		
Accomodations			
No	90% (188)		
Yes	6% (12)		
Age		18.99	1.07
GPA		3.18	.50
Sessions Per Week Spring		11.55	2.44
Sessions Per Week Fall		11.55	2.75

Procedure

Introductory Psychology students at Syracuse University were recruited for study participation through the SONA online recruitment system. Potential participants viewed a brief description of the study online that informed them that study participation entailed completion of a series of questionnaires related to health and college adjustment. Participants selected a desired date and time for study participation, and those who completed the survey received 1 hour of study

credit in exchange for participation. Paper and pencil questionnaires were completed in a research lab in groups of approximately 5-8 students per data collection session and took approximately 30-40 minutes to complete. Participants were given an overview of study requirements in addition to verbal and signed consent. Surveys were completed anonymously, and no identifying information was included on the questionnaires. Data was collected over the course of one month, from March 5-April 6.

Measures

The questionnaire included measures that assessed academic attendance and performance, health, mental health, and past illnesses. For a complete view of the questionnaire, see the Appendix.

Demographic characteristics

The survey began with items that assessed background characteristics, including gender, age, ethnic background, year in school, GPA, major, employment status, sorority/fraternity membership, living arrangements, Varsity sport team membership, political party, religious affiliation, parent(s)'s annual income, and academic accommodations.

Academic Performance and Class Attendance

Information on school functioning was assessed in a variety of ways. Participants were asked to check any of the following subjective factors that they felt hurt their academic performance: inconsistent or poor class attendance, difficulty following the way the professor(s) present material, classes that were too difficult for me, being in one or more classes I didn't like or wasn't interested

in, problems taking most tests, not getting extra help or tutoring, trouble talking with my professor(s), trouble managing time, not able to study effectively, difficulty concentrating, staying up too late/lack of sleep, and emotional problems. The total number of items selected was calculated for each participant.

Class attendance was assessed over several time periods. Participants were first asked how many class sessions per week they were expected to attend during the present semester. They were then asked approximately how many classes they had missed, been late to, or left early in the past month. The same question set was repeated for class sessions per week and classes missed, been late to, or left early in the previous semester. Participants were then asked a series of questions addressing classes missed for illness, other commitments or appointments, oversleeping, choosing not to go, and other reasons, with the following options: Never; 1-3 times; 4-6 times; More than 7 times.

Participants who reported taking less than 4 classes, the minimum amount to be considered a full-time student, were excluded from the study (N=7).

Mental Health Functioning

The Brief Symptom Inventory-18 (BSI-18) (Derogatis, 2000) is used to measure psychological distress and psychiatric disorders in community populations. The measure asks how much participants were bothered in the past 7 days by a total of 38 factors, which they rate on a a 5-point scale: Not at all (1), A little bit (2), Moderately (3), Quite a bit (4), Extremely (5). No items on this measure are reverse scored. Example items include being distressed or bothered by “Feeling lonely?” and “Trouble concentrating?” One question, which

addressed suicidal ideation, was removed from the item. The scores from each item were added up, and mean scores were compared between the participants with and without chronic health conditions. The BSI-18 had been normed in community samples and acceptable reliability and internal consistency (Derogatis, 2001).

The Center for Epidemiologic Studies Depression Scale (CES-D) is a self-report measure of depressive feelings and behaviors during the past week (Radloff, 1977). It involves "indicating the number which best describes how often [participants] felt or behaved this way during the past week," with the following options for each: 0, Rarely or none of the time (less than one day); 1, Some or a little of the time (1-2 days); 2, Occasionally or a moderate amount of time (3-4 days); or 3, Most of all of the time (5-7 days). Sample questions include "I was bothered by things that usually don't bother me," "My sleep was restless," and "I felt sad." Of the 20 items on the measure, 4 are reverse coded, such as the item "I felt hopeful about the future." The measure has been shown to adequate high internal consistency, test-retest repeatability, and validity (Radloff, 1977). Total scores were calculated, and the averages were compared between the participants with and without chronic medical conditions.

The Coping Self-Efficacy Scale, developed by Chesney and colleagues (2006) is a 26-item measure of perceived self-efficacy for coping with challenges and threats. Questions address how participants dealt with stressful situations in the past month, entering a number from 0-10, with 0 meaning "cannot do at all," 5 meaning "moderately certain can do," and 10 meaning "completely certain can

do." Items followed the stem "In the past month, including today, when things aren't going that well for you, how confident have you been that you can…" Questions were divided into three domains: Using problem-focused coping, which included 5 items; Stopping unpleasant emotions and thoughts, which included 3 items; and getting support from friends and family, which included 1 item. The scores for each domain were totaled, and the averages were compared between groups. The remaining 6 items were disregarded in scoring due to their lack of significance in previous factor analyses (Chesney, Neilands, Chambers, Taylor, & Folkman, 2006). Internal consistency and test-retest reliability have been demonstrated for the three domains used in this study (Chesney, Neilands, Chambers, Taylor, & Folkman, 2006).

General Health Functioning and Chronic Illness

All participants were given the Children with Special Needs (CSHCN) Screener, a measure used to identify children with ongoing physical, mental, behavioral or other conditions who also require a type or amount of health and related services beyond that required generally (CAHMI). It focuses on current consequences of chronic health conditions, but is not condition-specific. The measure has five items, which identify individuals who have at least one of the following health consequences: use or need of prescription medication; above average use or need of medical, mental health or educational services; functional limitations compared with other of the same age; use or need of specialized therapies (occupational therapist, physical therapist, speech, etc.); needs treatment or counseling for emotional, behavioral, or developmental problems. Any of the 5

health consequences must be due to a physical, mental, behavioral or other type of health condition which has lasted or is expected to last at least 12 months. The survey was designed to be administered via telephone to a caregiver, but participants filled it out for themselves in self-report format.

A measure from the National Health Interview Survey (NHIS) on Child Health conducted by the Bureau of the Census for the National Center for Health Statistics (NCHS) was used to collect information on health status and health care utilization of the US population. This checklist, as used by Newacheck and Taylor, was adapted from a phone interview to a self-report measure. Participants were asked to check if they had experienced any of a list of 33 conditions in the past 12 months. In the original measure, a set of follow-up questions addressing the frequency and amount of bother caused by the condition, including the days spent in bed, the days missed from school, and the use of medical services was asked for each condition. For this study, they were each answered only once per participant if they endorsed having any conditions.

Chronic Illness School Interference

Participants who endorsed one of the items on the NHIS checklist also completed a school interference section of the measure. Participants provided subjective ratings of the perceived effects of their illness on school attendance. This was measured by the question, “How much has your medical condition interfered with your attendance in class?” The question was followed by a 0-10 scale with the anchors of 0, meaning “has not interfered at all,” and 10, meaning “has interfered extremely.” This question was modeled in Logan, Simons, and

Kaczynski's research in school functioning in adolescents with chronic pain (2008).

This section also included the Pediatric Quality of Life Inventory (PedsQL^{TM} 4.0) School Functioning Scale (Varni, 1998) to measure the school functioning aspect of health related quality of life in illness. The measure included 5 items with the following options, coded 0-4: Never, Almost Never, Sometimes, Often, and Almost Always. The items included "it is hard to pay attention in school," "I forget things," I have trouble keeping up with my work or studies," I miss school because of not feeling well," and "I miss school to go to the doctor or hospital." The PedsQL^{TM} 4.0 has been validated in university student populations (Varni & Limbers, 2009).

Finally, participants answered two subjective questions addressing how much they perceived their illness as interfering with their school attendance and academic performance in college as compared to in high school. The options were coded on a 1-5 scale ranging from much worse, worse, about the same, better, and much better.

Data analysis

Data analysis was conducted using SPSS version 20.0. Based on Newacheck and Taylor's approach, participants were coded as having a chronic illness if they endorsed having any of the conditions known to be truly chronic (diabetes, arthritis, or some form of heart disease) (N=9) or if they endorsed any other of the health conditions on the checklist that required considerable medical care. Requiring considerable medical care was defined as answering "yes" to the

entirety of any of the questions in the CSHCN Screener discussed above (N=40) (CAHMI). The total number of participants coded as having a chronic medical condition was 45. The following analyses compared these two groups, defined as those with an identified chronic medical condition, and those without. Chi-square tests were used to detect demographic differences between the groups.

In order to address the first aim of the study, questions on the severity and impact of diseases were analyzed. Descriptive statistics were observed for the number of chronic illnesses reported by each individual, and the number of health consequences identified by the CSHCN Screener. Additionally, descriptive statistics were collected on the questions addressing school interference and impairment.

Hypothesis 1: It was hypothesized that students with chronic medical conditions would report poorer attendance than their healthy peers over the previous month and in the past semester. Six independent samples t-tests were conducted to examine the differences in these rates. To calculate for the previous month, answers to the question "How many class sessions per week are you expected to attend this semester?" were multiplied by four to account for the four weeks included in the previous month. Then, answers to the questions "Approximately how many classes have you missed in the past month," "Approximately how many classes have you been late to in the past month," and "Approximately how many classes have you left early in the past month" were separately divided by this sum. Then, an independent samples t-test was run for percentage of classes missed, percentage of classes arrived late to, and percentage

of classes left early in the past month. The entire process was repeated to compare percentage of classes missed, arrived late to, and left early in the previous semester. In this case, the reported number of class sessions expected to attend a week was multiplied by 15 to account for the semester in its entirety.

Hypothesis 2: It was hypothesized that students with chronic medical conditions would report lower grade point averages. An independent samples t-test was conducted to analyze differences in this variable between the two groups.

Hypothesis 3: It was hypothesized that students with chronic medical conditions would report a greater number of perceived academic difficulties. A variable was created to operationalize perceived academic difficulty by adding the total number of subjective factors that each participant felt hurt their academic performance. This sum was compared between the two groups in an independent samples t-test.

Hypothesis 4: It was hypothesized that students with chronic medical conditions would report significantly higher BSI-18 total scores. An independent samples t-test was conducted to compare total BSI-18 scores between the groups.

Hypothesis 5: It was hypothesized that students with chronic medical conditions would report significantly higher CES-D total scores. An independent samples t-test was conducted to compare total BSI-18 scores between the groups.

Hypothesis 6: It was hypothesized that students with chronic medical conditions would report lower scores in all three domains of the CSES. Three separate independent samples t-tests were conducted to compare the two groups

in total scores for using problem focused coping, thought stopping, and seeking social support.

Chapter 3

Results

Analyses focused only on participants who were full-time students. Participants who reported enrolling in less than 4 classes in the previous semester were removed (N=7). In addition, participants with missing data for any items were removed from all analyses. This resulted in a final usable sample of 209 participants.

Descriptive Findings

Preliminary analysis revealed that 22% of the sample met the aforementioned criteria for having a chronic medical condition (n = 45). In the complete sample, participants endorsed a range of chronic health conditions. In fact, on the NHIS checklist, participants endorsed an average of 1.03 conditions (SD = 1.26), with a range of 0-6 conditions. The most common ly endorsed condition was any "other bone, cartilage, muscle, or tendon problem," which included 15% of the sample (n = 32), followed by frequent or severe headaches, including migraines (14%, n = 28), and asthma (10%, n = 21). See Table 2 for a complete view of all reported conditions.

Chi-square tests were conducted to check for any differences in demographics between the groups. Overall, there were no gender, age, or ethnic differences

between the students with and without chronic medical conditions, $\square^2$ (1, n = 209) = .03, p = .86. Chi-square tests for independence also indicated no statistically significant association between having a chronic medical condition and age, $\square^2$ (3, n = 209) = 2.47, p = .48, or ethnicity , $\square^2$ (4, n = 209) = 4.10, p = .39.

In terms of chronic illness, 4% of the sample (n = 9) reported having one of the accepted chronic medical conditions from the NHIS check list. Nineteen per cent of the sample (n = 40) identified having one of the conditions on the NHIS check list and demonstrated at least one of the health consequences reported in the CSHCN Screener. Due to some overlap between these two groups, as participants with accepted chronic medical conditions also identified demonstrating at least one of the CSHCN consequences (n = 4), the total percentage of participants identified as having a chronic medical condition was 22% (n = 45). Therefore, the number of participants identified as "healthy," or not possessing a significant chronic medical condition, was 78% (n = 164).

Within the chronic illness group, there was a wide variety of conditions reported. The most commonly indicated condition was "other bone, cartilage, muscle, or tendon problem, which occurred in 15% of the entire sample (n = 32). Other conditions that occurred in greater than 5% of the sample included the following: frequent or severe headaches, including migraines (14%, n= 28); asthma (10%, n = 21); vision problems (blindness, crossed eyes, etc.) (9%, n = 18); any food or digestive allergy (7%, n = 15); and frequent or repeated diarrhea, colitis, or any other persistent bowel trouble (7%, n = 15). These prevalence rates

match closely to what would be expected in a sample of children (Boice 1998; Grant & Brito, 2010; Newacheck & Taylor, 1992). For a complete look at the conditions reported in the sample, see Table 2.

Table 2
Prevalence of Chronic Medical Conditions in the Sample

Permanent impairment due to stiffness or deformity of back or side, limbs, fingers, or toes	5 (2%)
Deafness or trouble hearing in both ears	1 (1%)
Blindness in one eye	1 (1%)
Crossed eyes	1 (1%)
Any other trouble seeing	16 (7%)
Stammering or stuttering	6 (3%)
Any other speech defect	1 (1%)
Diabetes	1 (1%)
Anemia	7 (3%)
Asthma	21(10%)
Eczema or any other skin allergy	14 (7%)
Arthritis or other joint problem	6 (3%)
Any other heart disease or condition	2 (1%)
Frequent or repeated ear infections	1 (1%)
Frequent or repeated diarrhea or colitis	4 (2%)
Any other persistent bowel trouble	11 (5%)
Any food or digestive allergy	15 (7%)
Frequent or severe headaches, including migraines	28(14%)
Mononucleosis	7 (3%)
Other bone, cartilage, muscle, or tendon problem	32(15%)
Conditions requiring surgery	17 (8%)
Conditions lasting more than 3 months	19 (9%)

Characterizing chronic illness

Descriptive statistics were observed for all questions given only to participants who endorsed having a chronic illness. Of those with chronic conditions, the average amount of conditions reported was 2.16 (*SD* = 1.43), and

the average number of health consequences identified in the CSHCN Screener was 1.71 (*SD* = 1.24).

Around half of the sample responded "yes" to the questions "During the past 12 months, did any of the conditions cause you to miss any time from school?" (45%, *n*=23) and "During the past 12 months, did any conditions cause you to stay in bed more than half the day?" (52%, *n* = 22). Sixty percent of the sample reported taking a medicine other than vitamins for their condition (*n* = 60). The average amount of classes in the past 12 months that were reported to have been missed due to a condition was 6.35 (*SD* = 16.70), and the average number of days in the past 12 months reported staying in bed for more than half the day because of any conditions was 5.55 (*SD* = 8.86). In response to the stem "When this condition did bother you, you were bothered…" half of those with chronic medical conditions reported it bothering them "a great deal" (*n* = 21), 43% reported it bothering them "some" (*n* = 18), and 7% reported it bothering them "very little." For a full list of responses to school interference questions, see Table 3.

Table 3
School Impairment in Participants with Chronic Medical Conditions

N=45				
		Percentage	Mean	Standard Deviation
During the past 12 months, did any of the conditions cause you to miss any time from school?				
	Yes	55% (*n* = 23)		
	No	45% (*n* = 19)		

During the past 12 months, did any conditions cause you to stay in bed more than half the day?				
	Yes	52% (*n* = 22)		
	No	48% (*n* = 20)		
During the past 12 months, did any of the above conditions make it necessary for you to use any medicine, other than vitamins, that a doctor prescribed OR told you to take?				
	Yes	63% (*n* = 27)		
	No	36% (*n* = 15)		
How many classes in the past 12 months did you miss all or part of because of any of the above conditions?			6.35	16.70
How many days in the past 12 months did you stay in bed more than half of the day because of any of the above conditions?			5.56	8.76
During the past 12 months, about how many nights did you spend in the hospital because of any of the above conditions?			.33	.80
During the past 12 months, about how many times did you see or talk to a medical doctor or assistant about any of the above conditions? (Do not count doctors seen while an overnight patient in a hospital)			4.45	6.37
When this/these condition(s) did bother you, you were bothered…				
	A great deal	50% (*n* = 21)		
	Some	43% (*n* = 18)		
	Very little	7% (*n* = 3)		

Hypothesis testing

Academic differences as a function of health status In the first level of analysis, separate tests were conducted to test each hypothesis. Table 3 contains the analyses from the first three hypotheses, which address whether academic functioning varies as a function of whether a student is experiencing a chronic medical condition or not. To test hypothesis 1 that students experiencing a chronic health condition would report poorer class attendance, independent t-tests were conducted to compare the mean proportion of classes missed in each group. For classes occurring in the previous month, there was not a statistically significant difference in the percentage of classes missed between students with chronic medical conditions (M = .08, SD = .07) and without (M = .08, SD = .08); t (206) = .82, p = .41, nor was there a statistically significant difference for classes missed in the previous semester (t (205) = .005, p = .996. Independent Samples t-tests also revealed no significant effect of chronic illness on arriving late for or leaving early from class in the previous month or semester.

In the domain of academic performance, as addressed in hypothesis 2, grade point average did not differ between those affected by a chronic medical condition (M = 3.22, SD = .43), and those not affected (M = 3.17, SD = .51), t (206) = -.636, p = .53.

Hypothesis 3 predicted that students experiencing a chronic medical condition would report a greater number of perceived academic difficulties. An independent-samples t-test showed that the number of reported academic difficulties did not differ between participants with chronic medical conditions (

M = 4.73, *SD* = 2.45) and those without (*M* = 3.98, *SD* = 2.24), *t* (206) = *-1.92*, *p* = .06. For a complete list of the analyses on academic functioning, see Table 4.

Table 4
T-Test Results Comparing Students with and without Chronic Medical Conditions in School Functioning

N = 209

		With Chronic Conditions	Without Chronic Conditions	*t*	*df*
Previous month					
	Percent classes missed	.08(.07)	.08(.08)	.82	206
	Percent classes arrived late to	.03(.05)	.04(.08)	.59	206
	Percent classes left early	.01(.02)	.02(.03)	.28	207
Previous semester					
	Percent classes missed	.04(.03)	.04(.04)	.005	205
	Percent classes arrived late to	.01(.02)	.02(.03)	1.25	206
	Percent classes left early	.01(.01)	.01(.01)	.27	206
GPA		3.22(.43)	3.17(.51)	-.0636	206
Number of perceived academic difficulties		4.73(2.36)	3.98(2.24)	01.92	206

*Note. *=p<.05, ***=p<.001. Standard Deviations appear in parentheses below means.*

Mental health differences as a function of health status. Analyses associated with the question of whether mental health functioning varies as a function chronic medical condition status are displayed in Table 5. Results of an independent samples t-test assessing hypothesis 4 revealed that students with chronic medical conditions reported higher mean BSI-18 scores (M = 71.83, SD = 25.40) than did their healthy peers (M = 62.52, SD = 15.40); t (194) = -2.96, p = .00.
An independent samples t-test was conducted to assess if participants with chronic medical conditions reported higher CES-D scores. Consistent with the hypotheses, participants with achronic health condition reported higher levels of depressive symptoms (M = 18.07, SD = 11.72) compared to those without a chronic health condition (M = 13.39, SD = 8.09); t (204) = -3.09, p = .003.

The final hypothesis concerned the prediction that participants with chronic conditions would report lower levels of coping self-efficacy, as assessed by the CSES. Three separate independent samples t-tests were conducted. The differences in problem focused coping between participants with chronic conditions (M = 28.93, SD = 11.80) and without (M = 33.66, SD = 9.44) were significant; t (207) = 2.81, p = .005. There was also a significant difference between the affected participants (M = 15.40, SD = 8.19) and their healthy peers in thought stopping (M = 18.49, SD = 7.27); t (207) = 2.459, p = .015. In both cases, the chronic illness group exhibited lower levels of perceived ability to cope. No statistically significant difference was found in seeking social support between participants with chronic conditions (M = 7.00, SD = 3.00) and those without (M

= 7.66, *SD* = 2.47); *t* (206) = 1.52, *p* = .13. Refer to Table 5for all analyses on mental health functioning between the two groups.

Table 5
T-Test Results Comparing Students with and without Chronic Medical Conditions in Mental Health Functioning

N = 209

	With Chronic Conditions	Without Chronic Conditions	*t*	*df*
BSI-18 score	71.83(25.40)	62.52(15.40)	-2.96***	194
CES-D score	18.07(11.72)	13.39(8.09)	-3.09***	204
Coping problem focused	28.93(11.80)	33.66(9.44)	2.81***	207
Coping thought stop	15.40(8.19)	18.49(7.27)	2.46***	207
Coping find social support	7.00(3.00)	7.66(2.47)	1.52	206

*Note. *=p<.05, ***=p<.001. Standard Deviations appear in parentheses below means.*

Chapter 4

Discussion

Primary research questions

The rates of chronic illness reported in this study provide insight into the more prevalent conditions in college populations. The sample had a chronic illness prevalence rate of 22%, which falls between the observed rate in children (15-18%) and adults (45%) (Anderson & Horvath, 2004; Perrin, Bloom, & Gortmaker, 2007. Asthma was found to affect 10% of the sample, the exact prevalence in children in the United States (Boice 1998; Grant & Brito, 2010). Eczema and other skin allergies, frequent headaches, and speech deficits were also very common in the sample, as would be expected (Newacheck & Taylor, 1992). However, other conditions that are common in children, such as frequent and repeated ear infections, did not appear.

The average number of conditions reported in the chronic illness sample was 2.16, although the majority of the sample endorsed one. Only half the sample reported missing time from school or having to stay in bed more than half the day due to the condition, which implies that there is a wide variety of severity in these conditions. The average number of reported classes due to the condition in the past year was 6.35, while the average reported missed school days in children per

year is 6 (Newacheck & Taylor, 1992). These rates are difficult to compare due to the differences between elementary and middle school and higher education. The average amount of days spent in bed due to the condition was much higher than has been reported in the literature on childhood, at 5.55 and 2, respectively (Newacheck & Taylor, 1992). College students in the sample also reported their condition as much more of a bother than children have in the past (Newacheck & Taylor, 1992). There was a wide variety of chronic diseases impacting in the sample, which is also consistent with previous studies (Newacheck & Taylor, 1992).

The results of the study provided no support for the hypothesis that academic functioning would vary as a function of whether a student experiences a chronic medical condition or not. Participants with chronic illness report the same frequency of missed class as did their healthy peers. Affected students did not demonstrate poorer academic performance. Additionally, both groups had comparable amounts of perceived difficulties in academic performance.

The second research question, whether mental health functioning varies as a function of whether a student has a chronic medical condition, yielded several important findings. Students with chronic conditions demonstrated significantly higher levels of mental health symptomology, including psychological distress and elevated levels of depression. Those with a chronic health condition also reported lower perceived ability to use problem focused coping and lower perceived ability to stop negative thoughts and feelings.

These findings suggest that only some of the trends observed in children and adolescents appear to continue into early adulthood. College students with chronic medical conditions do not appear to miss any more school than their healthy peers, which contrasts research findings among children (Fowler, Davenport, & Garg, 1992; Logan, Simons, Stein, & Chastain, 2008; Sexson & Madan-Swain, 1993; Taras & Potts-Datema, 2005; Weitzman, 1986). Even though adolescents with chronic conditions have been observed to be more likely to skip school (Michaud, Suris, & Viner, 2007), this does not appear to be the case with college students. Fortunately, the academic problems found in children and adolescents were not portrayed in this study. Although children with asthma, for example, demonstrate significantly higher rates of failure (Fowler, Davenport, & Garg, 1992) they had comparable grade point averages. Given the lack of differences in school attendance and role of school as a predictor of performance in the classroom (Crede, Roch, & Kieszczynka, 2010), the lack of differences in academic performance are perhaps not surprising.

The results of this study point to alarming rates of mental health symptomology in college students with chronic medical conditions. Pinquart and Shen noted that children and adolescents with chronic illness showed higher levels of internalizing symptoms, a finding that was confirmed in this study by their clinically elevated score on the CES-D scale (2010). The significantly higher scores on the BSI-18, representing greater psychological distress, among participants with chronic medical conditions shows that the trend of chronically ill

adolescents having higher mental health disorders does not dissipate in college (Burns, Sadof, & Kamat, 2006; Michaud, Suris, & Viner, 2007).

Limitations

This study was not without limitations. The sample was not truly random, as participants were recruited in order to fulfill class requirements. The size of the sample was relatively small, and participants were all drawn from one private university in the northeastern United States. This reduces the generalizability of the findings, and future studies should include a broader approach to participant recruitment. Another limitation is that the sample was primarily composed of freshmen students, who are still in their first year of adjusting to college life. Grade point averages and class attendances could vary throughout the college years. In addition, data were gathered via self-report, which could lead to some inaccuracies, especially in disclosure of grade point averages. Furthermore, remembering class schedules and estimating the amount of classes missed, left early, and arrived late to in the previous semester may have been difficult for some participants to estimate.

The way in which chronic illness was defined also could have affected the results. Studies assessing chronic illness use a variety of methods to define it, taking into account different levels of duration, age of onset, limitation of age-appropriate activity, visibility, expected survival, mobility, physiological functioning, cognition, emotional and social impairment, sensory functioning, communication impairment, clinical course, and uncertainty about the outcome (Michaud, Suris, & Viner, 2007). According to Newacheck and Taylor, there are no accepted

criteria for defining chronic illness (1992), although this study modeled the methodology used by them. Therefore, it is difficult to compare results of this study to others that have used a different definition. Furthermore, age of onset was not taken into account. Sawyer et al. found that the longer someone has a chronic medical condition, the less interference it has with school and activities (2004). In the case of college students, some may have been diagnosed in childhood and coping with the illness for many years, while some who are newly diagnosed may experience greater impairment.

Finally, the sample of students with chronic medical conditions showed a wide range of severity in their conditions. Individual conditions may have more of an impact, and individuals may cope with their illnesses very differently.

Implications

The findings of this study have far-reaching implications. The prevalence of chronic medical conditions is projected to increase at least one percent every year for the next 30 years (Anderson & Horvath, 2004). As the number of people affected by chronic illness increases, the associated problems will only become worse. This will result in dramatically larger numbers of young adults entering college with chronic diseases, which, according to the results of this study, will have significant mental health problems. As Perrin, Bloom, and Gortmaker predicted, this will lead to "larger numbers of younger adults with lower quality of life, poorer social interactions, and less community participation" in the very near future (2007). Therefore, these affected college students may benefit from psychosocial support in addition to medical care. This is especially true due to the

fact less than a fifth of adolescents with chronic conditions and mental health concerns seek professional help (Boice, 1998), a rate that probably continues in the college population.

It is especially important that people this age receive help because they are not only battling a chronic medical illness, but coping with the stress of transitioning to college life. According to Pritchard, Wilson, and Yamnitz, normal college students show declines in both physical and psychological health their first year (2007). Low self-esteem and poor coping habits predict worse physical health, yet high self-esteem leads to better psychological outcomes (Pritchard, Wilson, & Yamnitz, 2007). Accordingly, as students with chronic conditions tend to demonstrate depression and poor perceived coping ability, their physical and mental health is more likely to decline. The stress-filled college environment is especially hard on these students, as chronic disease is already associated with a risk of depression and anxiety, and stress can exacerbate these symptoms (Grant & Brito, 2010).

An additional challenge for all college students is the process of making new friends and developing a social life. Studies show that adolescents with chronic medical conditions report making friends less easily than those without (Miauton, Narring, & Michaud, 2003). Undoubtedly, having depression will continue to interfere with the friend-making process in college, leading to social isolation.

The college experience is notorious for being a time of high risk behavior and poor decision making in the general population. Several studies have found

that adolescents with chronic disorders "engage in experimental behavior and place themselves in risky situations as often, or even more often than their peers" (Michaud, Suris, & Viner, 2007). Already by the time they reach adolescence, individuals with chronic illness participate in more binge drinking, driving under the influence, cigarette smoking, cannabis use (Burns, Sadof & Kamat, 2006; Miauton, Narring, & Michaud, 2003; Michaud, Suris, & Viner 2007), rates that will most likely continue in college if not addressed.

Without intervention, the mental health problems experienced by these students may extend not only through college, but into the future. In the long-term, adolescents with chronic illness consider the future less positively and are less confident in finding a job, a fear they will need to face after college ends (Miauton, Narring & Michaud, 2003). After college, depression can cause significant impairment. Schneiderman found that depressed affect was associated with an increased incidence in mortality, especially with chronic conditions (2004). It also leads to faster and more impairing declines in health due to the disease (Schneiderman, 2004). Therefore, depression must be caught as early as possible in order to prevent unnecessary physical decline.

The results of this study suggest that merely treating college students for their medical conditions is not sufficient. Due to the correlation between having a chronic medical condition and having a mental health problem health care providers should screen for mental health difficulties when working with college students. Students with chronic illness may benefit from additional support, which could lead to less depression, anxiety and improve perceived coping ability.

Successful intervention would allow these affected students to have the same college experience as their peers in addition to a healthier adulthood.

Directions for Future Research

Much more research is needed to fully understand the interaction between chronic illness and both academic and mental health functioning in this understudied population, and to develop appropriate interventions. Statistics on mental health service usage in college students should be collected. Future studies should also consider age of disease onset and chronic illness severity in how they affect class attendance, academic performance, and mental health. Research should be done in order to identify resiliency factors in students with chronic illness who do not suffer from mental health difficulties. Finally, long-term studies should assess the prognosis of these students and how they function after college.

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Appendicex

Health and Academic Performance In College Students

Date administered: _____ Initials: _____

Date entered: _____ Intials: _____

Demographics

1. What is your gender?

   ☐ Male (1) □ Female (2)

2. What is your age? _____ years old

3. What is your ethnic background?

   ☐ 1 African American □ 3 Latina □ 5 Asian/Pacific Islander

   ☐ 2 White/Caucasian □ 4 Native American

   □ 6 Other: _____

4. What year are you at SU?

   ☐ 1 Freshman □ 2 Sophomore □ 3 Junior □ 4 Senior

5. What is your current GPA? _____

6. What is your major? _____

7. Are you currently employed?

   No Yes

   □ 0 □ 1 → 7a. How many hours per week do you work? _____

   ↓

   7b. What type of work do you do? _____

8. Do you belong to a social sorority or fraternity?

   ☐ No (0) □ Yes (1)

9. Where do you live?

   ☐ 1 Dorm □ 3 On-campus apartment □ 5 Off-campus apartment/house

   ☐ 2 Parents' Home □ 4 Sorority/Fraternity house □ 6 Other: _____

10. Do you play a varsity sport at SU?

    □ No (0) □ Yes (1)

11. Do you affiliate with a political party?
□ 1 Democrat □ 4 Republican
□ 2 Independent □ 5 Green
□ 3 No Affiliation □ 6 Other: _____

12. Please check the box that best describes your religious affiliation:
1 □ None
2 □ Catholic
3 □ Jewish
4 □ Islamic
5 □ Hindu
6 □ Atheist/Agnostic
7 □ Protestant or other Christian
8 □ Buddhist
9 □ Other:_____

13. About how many times did you attend church or religious services in the last year? _____ times

14. Please give an estimate of your parent(s)' annual income:
1 □ $0-$40,000
2 □ $40,000-$70,000
3 □ $70,000-$100,0006 □ $400,000+
4 □ $100,000-$200,000
5 □ $200,000-$400,000

15. Do you receive any accommodations due to a disability from Syracuse University, such as extensions on assignments, a modified schedule, tutoring, or a 504 plan?
No Yes
□ 0 □ 1 ⟶ What are they?
_____

16. Check any of the following that you feel hurt your academic performance:

- ❑ Inconsistent or poor class attendance
- ❑ Difficulty following the way the professor(s) present material
- ❑ Classes that were too difficult for me
- ❑ Being in one or more classes I didn't like or wasn't interested in
- ❑ Problems taking most tests
- ❑ Not getting extra help or tutoring
- ❑ Trouble talking with my professor(s)
- ❑ Trouble managing time
- ❑ Not able to study effectively
- ❑ Difficulty concentrating
- ❑ Staying up too late/lack of sleep
- ❑ Emotional problems

17. How many classes did you take last semester? _____

a. How many "A"s did you receive? _____
b. How many "A-"s did you receive? _____
c. How many "B+"s did you receive? _____
d. How many "B"s did you receive? _____
e. How many "B-"s did you receive? _____
f. How many "C+"s did you receive? _____
g. How many "C"s did you receive? _____
h. How many "C-"s did you receive? _____
i. How many "D"s did you receive? _____
j. How many "F"s did you receive? _____

Note: Please check that the sum of all grades received equals the number of classes you took. For example, if you received 3 "C"s, 2 "B+"s, and 1 "A-", you should have taken 6 classes.

Class Attendance

1. How many class sessions per week are you expected to attend this semester?
(For example, if a class meets every Tuesday and Thursday, that counts as two sessions per week. So if your class schedule is: two lectures Monday; one lecture and one lab Tuesday; one lecture and two recitations Wednesday; and one lecture Thursday you have a total of 2+2+3+1=8 classes.)

_____

2. These next questions pertain to the last *month*. Thinking about all of your classes in the past *month*…

…Approximately how many classes have you missed in the past month? _____

…Approximately how many classes have you been late to in the past month? _____

…Approximately how many classes have you left early in the past month? _____

Comment [PV1]: Is there any danger that people will state how many classes they are taking rather than thinking about distinct class periods??

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3. These next questions pertain to the fall *semester of 2012*. How many class sessions per week are you expected to attend during the fall semester? (For example, if a class met every Tuesday and Thursday, that counts as two sessions per week. So if your class schedule was: two lectures Monday; one lecture and one lab Tuesday; one lecture and two recitations Wednesday; and one lecture Thursday you had a total of 2+2+3+1=8 classes.)

_____

4. Thinking about all of your classes in the fall *semester*…

…Approximately how many classes did you miss in the fall semester? _____

…Approximately how many classes were you late to in the fall semester? _____

…Approximately how many classes did you leave early in the fall semester? _____

5. Think of the times when you missed class during the fall semester, how often have you missed because of *illness*? (Please check one)

- ❑ Never
- ❑ 1-3 times
- ❑ 4-6 times
- ❑ More than 7 times

6. Think of the times when you missed class during the fall semester, how often have you missed because of *other commitments or appointments*?

- ❑ Never
- ❑ 1-3 times
- ❑ 4-6 times
- ❑ More than 7 times

7. Think of the times when you missed class during the fall semester, how often have you missed because *you overslept*?

- ❑ Never
- ❑ 1-3 times
- ❑ 4-6 times
- ❑ More than 7 times

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8. Think of the times when you missed class during the fall semester, how often have you missed because *you chose not to go*?

- ❑ Never
- ❑ 1-3 times
- ❑ 4-6 times
- ❑ More than 7 times

9. Think of the times when you missed class during the fall semester, how often have you missed *for other reasons*?

- ❑ Never
- ❑ 1-3 times
- ❑ 4-6 times
- ❑ More than 7 times

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Brief Symptom Inventory- 18

Directions: The following are problems that people sometimes have. Please read each item carefully and select the response that best describes how much that problem has distressed or bothered you during the *past 7 days* including today.

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How much were you distressed in the past 7 days by…	Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
1. Nervousness or shakiness inside?	1	2	3	4	5
2. Faintness or dizziness?	1	2	3	4	5
3. The idea that someone else can control your thoughts?	1	2	3	4	5
4. Feeling others are to blame for most of your trouble?	1	2	3	4	5
5. Trouble remembering things?	1	2	3	4	5
6. Feeling easily annoyed or irritated?	1	2	3	4	5
7. Pains in heart or chest?	1	2	3	4	5
8. Feeling afraid in open spaces?	1	2	3	4	5
9. Feeling that most people cannot be trusted?	1	2	3	4	5
10. Poor appetite?	1	2	3	4	5
11. Suddenly scared for no reason?	1	2	3	4	5
12. Temper outbursts that you could not control?	1	2	3	4	5
13. Feeling lonely even when you are with people?	1	2	3	4	5
14. Feeling blocked in getting things done?	1	2	3	4	5
15. Feeling lonely?	1	2	3	4	5

16.	Feeling blue?	1	2	3	4	5
17.	Feeling no interest in things?	1	2	3	4	5
18.	Feeling fearful?	1	2	3	4	5
19.	Your feelings being easily hurt?	1	2	3	4	5
How much were you distressed in the past 7 days by…		Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
20.	Feeling that people are unfriendly or dislike you?	1	2	3	4	5
21.	Feeling inferior to others?	1	2	3	4	5
22.	Nausea or upset stomach?	1	2	3	4	5
23.	Feeling that you are watched or talked about by others?	1	2	3	4	5
24.	Trouble falling asleep?	1	2	3	4	5
25.	Having to check and double check what you do?	1	2	3	4	5
26.	Difficulty making decisions?	1	2	3	4	5
27.	Feeling afraid to travel on buses, subways, or trains?	1	2	3	4	5
28.	Trouble getting your breath?	1	2	3	4	5
29.	Hot or cold spells?	1	2	3	4	5
30.	Having to avoid certain things, places, or activities because they frighten you?	1	2	3	4	5
31.	Your mind going blank?	1	2	3	4	5
32.	Numbness or tingling in parts of your body?	1	2	3	4	5

33.	The idea that you should be punished for your sins?	1	2	3	4	5
34.	Feeling hopeless about the future?	1	2	3	4	5
35.	Trouble concentrating?	1	2	3	4	5
36.	Feeling weak in parts of your body?	1	2	3	4	5
37.	Feeling tense or keyed up?	1	2	3	4	5
38.	Having urges to beat, injure, or harm someone?	1	2	3	4	5

CES-D

Directions: Using the scale below, indicate the number which best describes how often you felt or behaved this way – DURING THE PAST WEEK.

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		0 Rarely or none of the time (less than 1 day)	1 Some or a little of the time (1-2 days)	2 Occasionally or a moderate amount of time (3-4 days)	Mo of (5-
1.	I was bothered by things that usually don't bother me.	0	1	2	3
2.	I did not feel like eating; my appetite was poor.	0	1	2	3
3.	I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
4.	I felt that I was just as good as other people.	0	1	2	3
5.	I had trouble keeping my mind on what I was doing.	0	1	2	3
6.	I felt depressed.	0	1	2	3
7.	I felt that everything I did was an effort.	0	1	2	3
8.	I felt hopeful about the future.	0	1	2	3
9.	I thought my life had been a failure.	0	1	2	3
10.	I felt fearful.	0	1	2	3
11.	My sleep was restless.	0	1	2	3
12.	I was happy.	0	1	2	3
13.	I talked less than usual.	0	1	2	3
14.	I felt lonely.	0	1	2	3
15.	People were unfriendly.	0	1	2	3
16.	I enjoyed life.	0	1	2	3

17.	I had crying spells.	0	1	2	3
18.	I felt sad.	0	1	2	3
19.	I felt that people disliked me.	0	1	2	3
20.	I could not get “going.”	0	1	2	3

Stressful Situations (CSES)

Directions: These questions ask about how you dealt with stressful situations in the past month, including today. For each of the following questions, please enter a number from 0-10, which 0 meaning "cannot do at all," 5 meaning "moderately certain can do," and 10 meaning "completely certain can do." *In the past month, including today, when things aren't going that well for you, how confident have you been that you can…*

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	0	1	2	3	4	5	6	7	8		
1. Keep from getting down in the dumps.	0	1	2	3	4	5	6	7	8		
2. Talk positively to yourself.	0	1	2	3	4	5	6	7	8		
3. Sort out what can be changed, and what can't be changed.	0	1	2	3	4	5	6	7	8		
4. Get emotional support from friends and family.	0	1	2	3	4	5	6	7	8		
5. Find solutions to your most difficult problems.	0	1	2	3	4	5	6	7	8		
6. Break an upsetting problem down into smaller parts.	0	1	2	3	4	5	6	7	8		
7. Leave options open when things get stressful.	0	1	2	3	4	5	6	7	8		
8. Make a plan of action and follow it when confronted with a problem.	0	1	2	3	4	5	6	7	8		
9. Develop new hobbies or recreations.	0	1	2	3	4	5	6	7	8		
10. Take your mind off unpleasant thoughts.	0	1	2	3	4	5	6	7	8		
11. Look for something good in a negative situation.	0	1	2	3	4	5	6	7	8		
12. Keep from feeling sad.	0	1	2	3	4	5	6	7	8		
13. See things from the other person's point of view during a heated argument.	0	1	2	3	4	5	6	7	8		
14. Try other solutions to your problems if your first solutions don't work.	0	1	2	3	4	5	6	7	8		
15. Stop yourself from being upset by unpleasant thoughts.	0	1	2	3	4	5	6	7	8		

Health Care Experiences (CSHCN Screener)

Directions: Based on your answer to each question, follow the arrows to the sub-question (if you answer yes) or to the next question (if you answer no).

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1. **Do you currently need or use medicine prescribed by a doctor (other than vitamins)?**
   - ☐ No
   - ☐ Yes → **Is this because of ANY medical, behavioral, or other health condition?**
     - ☐ No
     - ☐ Yes → **Is this a condition that has lasted or is expected to last for at least 12 months?**
       - ☐ No
       - ☐ Yes

2. **Do you need or use more medical care, mental health, or educational services than is usual for most people of the same age?**
   - ☐ No
   - ☐ Yes → **Is this because of ANY medical, behavioral, or other health condition?**
     - ☐ No
     - ☐ Yes → **Is this a condition that has lasted or is expected to last for at least 12 months?**
       - ☐ No
       - ☐ Yes

3. **Are you limited or prevented in any way in your ability to do the things most people of the same age can do?**
   - ☐ No
   - ☐ Yes → **Is this because of ANY medical, behavioral, or other health condition?**
     - ☐ No
     - ☐ Yes → **Is this a condition that has lasted or is expected to last for at least 12 months?**
       - ☐ No
       - ☐ Yes

4. **Do you need or receive special therapy, such as physical, occupational, or speech therapy?**
   - ☐ No
   - ☐ Yes → **Is this because of ANY medical, behavioral, or other health condition?**
     - ☐ No
     - ☐ Yes → **Is this a condition that has lasted or is expected to last for at least 12 months?**
       - ☐ No
       - ☐ Yes

5. Do you have any kind of emotional, developmental, or behavioral problem for which you need or receive treatment or counseling?

□ No □ Yes ⟶ **Is this because of ANY medical, behavioral, or other health condition?**

□ No □ Yes ⟶ **Is this a condition that has lasted or is expected to last for at least 12 months?**

□ No □ Yes

National Health Interview Survey

1. Have you had any of these medical conditions during the previous 12 months? Check all that apply.

- ❑ Missing limbs, fingers, or toes
- ❑ Permanent impairment due to stiffness or deformity of back or side, limbs, fingers, or toes
- ❑ Deafness or trouble hearing in one ear
- ❑ Deafness or trouble hearing in both ears
- ❑ Blindness in one eye
- ❑ Blindness in both eyes
- ❑ Crossed eyes
- ❑ Any other trouble seeing
- ❑ Stammering or stuttering
- ❑ Any other speech defect
- ❑ Cerebral palsy
- ❑ Diabetes
- ❑ Sickle cell anemia
- ❑ Anemia
- ❑ Asthma
- ❑ Eczema or any other skin allergy
- ❑ Epilepsy or convulsions without fever
- ❑ Arthritis or other joint problem
- ❑ Congenital heart disease
- ❑ Any other heart disease or condition
- ❑ Frequent or repeated ear infections
- ❑ Frequent or repeated diarrhea or colitis
- ❑ Any other persistent bowel trouble

- ❑ Any food or digestive allergy
- ❑ Frequent or severe headaches, including migraines
- ❑ Mononucleosis
- ❑ Hepatitis
- ❑ Meningitis
- ❑ Rheumatic fever
- ❑ Seizures associated with fever
- ❑ Other bone, cartilage, muscle, or tendon problem
- ❑ Conditions requiring surgery
- ❑ Conditions lasting more than 3 months

2. Have you had any of these psychiatric illnesses during the previous 12 months? Check all that apply.

- ❑ Anxiety Disorder
- ❑ Bipolar Disorder
- ❑ Major Depression
- ❑ Schizophrenia/Schizoaffective Disorder
- ❑ Other psychiatric condition: _____

3. Did you check yes to any of the above conditions?
   - ❑ No
   - ❑ Yes

If you checked any of the conditions on page 10, please continue with the survey. If you did not have any of the conditions on page 10 in the past 12 months, you are done and may turn in your survey.

The following questions address the condition you checked on page 10. If you checked more than one condition, answer each question about the condition that is the most severe to you.

1. During the past 12 months, did any of the above conditions cause you to miss any time from school?
   - ❑ No
   - ❑ Yes

2. How many classes in the past 12 months did you miss all or part of because of any of the above conditions? _____

3. During the past 12 months, did any of the above conditions cause you to stay in bed more than half the day?
   - ❑ No
   - ❑ Yes

4. How many days in the past 12 months did you stay in bed more than half the day because of any of the above conditions? _____

5. During the past 12 months, about how many nights did you spend in the hospital because of any of the above conditions? _____

6. During the past 12 months, about how many times did you see or talk to a medical doctor or assistant about any of the above conditions? (Do not count doctors seen while an overnight patient in a hospital.) _____

7. During the past 12 months, did any of the above conditions make it necessary for you to use any medicine, other than vitamins, that a doctor prescribed OR told you to take?
   - ❑ No
   - ❑ Yes

8. In the last 12 months, how often did any of the above conditions cause you pain or discomfort or upset you?
   - ❑ No
   - ❑ Yes

9. When this/these condition(s) did bother you, were you bothered..
   - ❑ A great deal
   - ❑ Some
   - ❑ Very Little

School Interference (VAS and PedsQL School Subscale)

1. How much has your medical condition interfered with your attendance in class? Please circle a number from 0-10, with 0 meaning has not interfered at all, and 10 meaning has interfered extremely:

0 1 2 3 4 5 6 7 8 9 10

2. Please circle one option for each of the following questions:

	0 Never	1 Almost Never	2 Sometimes	3 Often	4 Almost Always
It is hard to pay attention at school	0	1	2	3	4
I forget things	0	1	2	3	4
I have trouble keeping up with my work or studies	0	1	2	3	4
I miss school because of not feeling well	0	1	2	3	4
I miss school to go to the doctor or hospital	0	1	2	3	4

3. How does your school attendance in college compare to your attendance in high school due to your medical condition? (Circle one)

Much worse	Worse	About the Same	Better	Much Better
1	2	3	4	5

4. How does your academic performance in college compare to your performance in high school due to your medical condition? (Circle one)

Much worse	Worse	About the Same	Better	Much Better
1	2	3	4	5

Summary of Capstone Project

As medical technologies continue to improve, what used to be considered terminal illnesses are now becoming chronic medical conditions. An estimated 23% of children are living with at least one chronic medical condition, a number that is increasing annually (Anderson & Horvath, 2004; Perrin, Bloom, & Gortmaker, 2007). These diseases, including asthma, diabetes, and autoimmune diseases, influence many aspects of everyday functioning of those affected. They interfere with participation in physical activities, family activities, schoolwork, and activities with friends (Sawyer et al., 2004). This interference has both short- and long-term ramifications. Studies have consistently shown that children and adolescents with chronic illnesses are at higher risk for a variety of behavior problems, especially internalizing symptoms like depression and social withdrawal (Pinquart & Shen, 2010). In addition, these youth also show higher levels of psychiatric disorders and health risk behaviors such as smoking daily (Hysing, Elgen, & Lundervold, 2009; Suris, Michaud, & Akre, 2008). School functioning is one of the most affected domains of these children's lives. School-age children with chronic conditions experience more frequent school absences than their healthy peers (Fowler, Davenport & Garg, 1992; Logan, Simons, Stein, & Chastain, 2008; Sexson & Madan-Swain, 1993; Taras & Potts-Datema, 2005; Weitzman, 1986) and perform more poorly in school despite having equitable intelligence levels (Sexson & Madan-Swain, 1993).

Despite documentation of difficulties faced by younger children with chronic illnesses, there is a lack of research on the effects of chronic illness on college students. Poor academic performance and attendance problems can have

lasting effects on children and adolescents into adulthood, including difficulties in securing and maintaining employment (Kashikar-Zuck, Ting, Verkamp, Lynch-Jordan, Passo & Graham, 2010). Moreover, there is wide variability in the approaches used by schools and colleges to accommodate students with chronic illness (Fennell, Leitz & Fentauzzi, 2009). Therefore, research is needed to document the impact of chronic illnesses on general and school functioning across all age groups in order to develop appropriate solutions to the problem.

In this study, I examined the impact of chronic illness on academic performance, mental health, and quality of life among this understudied population. In order to assess this empirically, I developed and distributed a questionnaire to college students both with and without chronic medical conditions. The questionnaire included a variety of measures assessing academic attendance and performance, health, mental health, and past illnesses. The measure began with basic demographic questions, including college GPA and grades received. Class attendance was assessed by dividing the number of classes missed, arrived late to, or left early in the past month by the total number of classes expected to attend. The same was repeated for the previous semester. Participants were then asked a series of questions addressing the approximate number of classes missed for each of the following reasons: illness, other commitments or appointments, oversleeping, choosing not to go, and other reasons. Next, mental health functioning was assessed through a variety of measures. Participants completed the Brief Symptom Inventory-18 (Derogatis, 2001), which assessed psychological distress and psychiatric disorders; the CES-

Comment [T3]: Or college GPA?

D Scale, a self-report depression scale; and the Coping Self-Efficacy Scale (Chesney et al., 2006), a measure of perceived self-efficacy for coping with challenges and threats. In terms of general health functioning, participants were given a checklist addressing the presence and severity of chronic medical illnesses (Newacheck & Taylor, 1992) to distinguish between those with and without chronic medical conditions. The Children with Special Health Care Needs Screener (Bethel, et al., 2002) was also given to separate these two pools more strictly.

Once completing these sections of the questionnaire, only participants who signaled possessing one of the conditions surveyed in the chronic illness checklist were asked to complete the final section. This section included a scale assessing how greatly the participant's medical condition has interfered with his or her attendance in class on a scale of 0-10. The Pediatric Quality of Life Inventory (PedsQL^{TM} 4.0) School Functioning Scale was also given, which has been standardized for use with young adults (Varni, 1998). This was followed by subjective questions that addressed how much they perceived their illness as interfering with their academic performance. Finally, these participants were asked subjective questions about how their illness affects their daily life and rated these questions on a scale that ranged from much worse, worse, about the same, better, or much better. For example, one question posed, "How does your academic performance in college compare to your performance in high school due to your medical condition?" Participants were recruited through the Syracuse SONA online recruitment system. PSY 205 students were notified of the study

and invited to participate in return for one research credit hour. Up to 8 students signed up per timeslot and attended one hour-long administration session in a research lab in a CNY Upstate Medical Building. Once in the room, they gave oral and written consent before completing the questionnaire.

I hypothesized that participants with chronic conditions would demonstrate lower rates of school attendance and academic performance while reporting higher numbers of perceived academic difficulties. I also hypothesized that participants with chronic conditions would have higher rates of psychological distress and depression, in addition to lower levels or perceived coping ability.

Approximately 22%, or 45 participants, of the sample were identified as having a chronic medical condition, which falls between the national prevalence rates for children (15-18%) and adults (45%) (Anderson & Horvath, 2004; Perrin, Bloom, & Gortmaker, 2007). Other bone, cartilage, muscle, or tendon problems were the most common, affection 32 participants, or 15% of the sample. This was followed by frequent headaches including migraines, asthma, and vision problems. The prevalence rates were consistent with the national rates. Asthma was found in 10% of the sample, the exact prevalence in children in the US (Boice 1998; Grant & Brito, 2010). The average number of conditions reported in the chronic illness sample was 2.16.

Results showed that there was no significant difference between participants with chronic medical conditions and their healthy peers in any domains of school functioning. They had equitable percentages of classes missed, left early, and arrived late to in both the previous month and the previous

semester. There was also no difference between the groups in GPA or perceived number of academic difficulties. However, the chronic condition group demonstrated significantly more mental health problems. Their scores on the BSI-18, measuring psychological distress, were much higher than their healthy peers. Additionally, the average CES-D score for the participants with chronic medical conditions was not only higher than those without, it was above the clinical level for depression. On the Coping Self-Efficacy Scale, participants in the chronic condition group demonstrated lower levels of perceived coping ability on two of the three domains: using problem-focused coping and stopping unpleasant thoughts and feelings. There was no difference between the groups in the perceived ability to seek social support.

These findings suggest that only some of the trends observed in children and adolescents appear to continue into early adulthood. College students with chronic medical conditions do not appear to miss any more school or perform any worse than their healthy peers, which contrasts with that research has consistently shown in children (Fowler, Davenport, & Garg, 1992; Logan, Simons, Stein, & Chastain, 2008; Michaud, Suris, & Viner, 2007; Sexson & Madan-Swain, 1993; Taras & Potts-Datema, 2005; Weitzman, 1986). Despite this fact, the the rates of mental health symptomology in this study were alarming. Levels of psychological distress, internalizing symptoms, and depression, which are consistently observed in children with chronic conditions, appear to continue into early adulthood (Burns, Sadof, & Kamat, 2006; Michaud, Suris, & Viner, 2007; Pinquart & Shen, 2010).

The results of this study suggest that merely treating college students for their medical conditions is not sufficient. Students with chronic illness may benefit from additional support, which could lead to less depression, anxiety and improve perceived coping ability. The prevalence of chronic medical conditions is projected to increase at least one percent every year for the next 30 years (Anderson & Horvath, 2004). As the number of people affected by chronic illness increases, the associated problems will only become worse. Without intervention, the mental health problems experienced by these students will extend not only through college, but into the future. After college, depression can cause significant impairment. Schneiderman found that depressed affect was associated with an increased incidence in mortality, especially with chronic conditions (2004). It also leads to faster and more impairing declines in health due to the disease (Schneiderman, 2004). Therefore, depression must be caught as early as possible in order to prevent unnecessary physical decline.

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