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# Impact of Perceived Health Competence and Current Living Situation on the Quality of Life of Emerging Adults with Chronic Health Conditions

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IMPACT OF PERCEIVED HEALTH COMPETENCE  
AND CURRENT LIVING SITUATION ON THE QUALITY OF LIFE  
OF EMERGING ADULTS WITH CHRONIC HEALTH CONDITIONS

by

Amy C. Lang

A Thesis Submitted in  
Partial Fulfillment of the  
Requirements for the Degree of

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at

The University of Wisconsin-Milwaukee

May 2018

## ABSTRACT

### IMPACT OF PERCEIVED HEALTH COMPETENCE AND CURRENT LIVING SITUATION ON THE QUALITY OF LIFE OF EMERGING ADULTS WITH CHRONIC HEALTH CONDITIONS

by

Amy C. Lang

The University of Wisconsin-Milwaukee, 2018  
Under the Supervision of Professor W. Hobart Davies, PhD

As emerging adults with chronic health conditions navigate the process of assuming greater responsibility regarding their own healthcare during this transitional period of life, they may encounter increased stress, which is known to exacerbate the symptoms and worsen the prognosis of their conditions. The results of the current study add to emerging evidence in the literature that health competence is positively associated with quality of life, particularly for individuals with chronic health conditions. Higher quality of life is associated with better health outcomes, highlighting the importance of interventions aimed to promote quality of life. Future research should focus on the development of targeted interventions for emerging adults with chronic health conditions that involve both parents and healthcare providers and promote health competence with the goal of increasing independent self-management, enhancing coping skills, helping with adjustments to living with chronic health conditions in adulthood, and improving overall quality of life.

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## LIST OF ABBREVIATIONS

CHC = chronic health condition

PHC = perceived health competence

QoL = quality of life

## Impact of Perceived Health Competence and Current Living Situation on the Quality of Life of Emerging Adults with Chronic Health Conditions

Between 12 and 44% of children and adolescents in the United States are currently living with a chronic health condition (Kuhlthau, Beal, Ferris, & Perrin, 2002; Newacheck & Halfon, 1998; Van Cleave, Gortmaker, & Perrin, 2010; van der Lee, Mokkink, Grootenhuis, Heymans, & Offringa, 2007), and approximately 40% of these children and adolescents have two or more conditions (National Survey of Children's Health, 2011/12). There is a wide range of estimated prevalence rates of chronic health conditions among children and adolescents due to the lack of a standardized definition, within professional communities (i.e., academic, medical, and policy) and the public, of what constitutes a chronic health condition (e.g., Bernell & Howard, 2016). Commonly, chronic health conditions are defined as presenting with three key features: prolonged duration, unlikely to spontaneously resolve, and diminished ability to be completely cured (Goodman, Posner, Huang, Parekh, & Koh, 2013). Additionally, chronic health conditions frequently result in impairment in cognitive, emotional, physical, and/or social functioning (Stein, Bauman, Westbrook, Coupey, & Ireys, 1993). Within this broad conceptualization, some of the more common chronic health conditions among children and adolescents include allergies, asthma, developmental disabilities, frequent or persistent headaches, obesity, and recurrent abdominal pain (Compas, Jaser, Dunn, & Rodriguez, 2012; Newacheck, McManus, & Fox, 1991; Torpy, Campbell, & Glass, 2010; Van Cleave et al., 2010).

### **Non-Categorical Approach to Chronic Health Conditions**

Each chronic health condition is unique in its intensity of treatment demands, degree of life intrusion, and permanence. Some conditions, such as infrequent tension headaches or mild recurrent abdominal pain, are persistent and result in increased stress for the individual, but do

not cause significant daily life intrusions or require a strict set of treatment demands to manage the symptoms (Petersen, 2008; Petersen, Hagglof, & Bergstrom, 2009). Other chronic health conditions, such as mild asthma or allergies, require daily attentiveness to avoid situations that could potentially induce a reaction, but only episodic treatment if a reaction were to occur (Pawankar, 2014; van Aalderen, 2012). Certain other conditions, such as Type 1 diabetes, have severe health consequences if left untreated or undertreated and require significant daily vigilance to successfully manage the symptoms (American Diabetes Association, 2011). Although many chronic health conditions are considered life-long, it is possible for children and adolescents diagnosed with certain conditions to experience remission (Van Cleave et al., 2010). For example, some autoimmune conditions, such as Crohn's disease or rheumatoid arthritis, may demonstrate remission when treated with medication (Demoruelle & Deane, 2012; Panaccione & Ghosh, 2010).

Despite the unique challenges associated with each condition, there is a high degree of common experiences across conditions and Stein and Jessop (1982, 1989) argue for a non-categorical approach to studying and understanding chronic health conditions among children and adolescents. Chronic health conditions, regardless of type, can result in similar stressful experiences for children and adolescents, such as academic setbacks, decreased social interactions with peers, and functional limitations (Stein & Jessop, 1982, 1989). A chronic health condition, according to the non-categorical approach, has a biological, cognitive, or psychological basis and comprises one or more of the following components: limitations in daily function, dependence on compensatory mechanisms, and necessitating services beyond routine care (Stein et al., 1993; Stein, Bauman, Epstein, Gardner, & Walker, 2000). While a disease-specific approach focuses on the consequences of a specific condition in isolation, a non-

categorical approach to chronic health condition research and treatment allows for a broader focus on health-related behaviors, regardless of condition, and encourages a more holistic view of the child (Sawyer, Drew, Yeo, & Britto, 2007; Stein et al., 1993; Stein & Jessop, 1982, 1989). Overall, Stein and Jessop (1982, 1989) posit that children and adolescents with chronic health conditions face many challenges and changes due to their conditions, but that these experiences are more similar across conditions than they are different. Given Stein and Jessop's (1982, 1989) argument and the lack of a clear foundational definition (e.g., Bernell & Howard, 2016), the current study utilized a non-categorical, self-report approach to identifying chronic health conditions (Goodman et al., 2013).

### **Negative Consequences of Chronic Health Conditions in Childhood and Adolescence**

The initial diagnosis of a chronic health condition often occurs unexpectedly and is the beginning of a long process of treatment, self-management, and adjustments in activities of daily living, which can cause significant stress for children and their families (Compas & Boyer, 2001; Compas et al., 2012; Ryan & Sawin, 2009). While stress is often associated with any health concern, there is evidence that chronic health conditions, particularly those with poorly controlled symptoms, lead to significantly greater physical and psychological stress than acute conditions (Compas et al., 2012; Marin, Chen, Munch, & Miller, 2009). Further, the stress experienced by individuals with chronic health conditions tends to be prolonged as they navigate how to best cope with and manage their conditions and adapt to difficult or unexpected experiences as they arise (Compas et al., 2012; Giammanco & Gitto, 2016). Children and adolescents with chronic health conditions are required to make long-term adjustments to manage the symptoms of their conditions, such as daily medications and/or treatments, as well as numerous visits to the hospital (Department of Child and Adolescent Health and Development,

2007; Turkel & Pao, 2007). Additionally, these children and adolescents may have to accept activity limitations, frequent pain or discomfort, and atypical growth or development as part of their daily lives (Compas et al., 2012; Department of Child and Adolescent Health and Development, 2007; Turkel & Pao, 2007). Unfortunately, daily stressors, along with the additional stress due to the symptoms and treatment of the condition itself, have been shown to exacerbate the symptoms and prognosis of a chronic health condition (e.g., Compas et al., 2012). However, certain individual and family factors, such as greater knowledge about one's own condition, higher general self-efficacy, and a stable, supportive family environment, have shown to be facilitators of better coping skills and a more successful adjustment to the stress of living with a chronic health condition (Griva, Myers, & Newman, 2000; Jerusalem & Schwarzer, 1993; Perez, 1997).

Being diagnosed with a chronic health condition may slow the process of increasing independence from one's parents that commonly occurs during late childhood and throughout adolescence (Compas et al., 2012; Gledhill, Rangel, & Garralda, 2000; Turkel & Pao, 2007). A chronic health condition could also lead to regression of already developed parental independence, such that children become more dependent upon their parents than they were prior to their diagnosis (Gledhill et al., 2000). The potential diminished independence of children with chronic health conditions requires significant adjustment by parents and other caregivers (Compas et al., 2012; Gannoni & Shute, 2010; Heath, Farre, & Shaw, 2017; Smith, Cheater, & Bekker, 2015). For families, having a child with a chronic health condition may result in social isolation, major expense and time commitment, reduced time and attention for siblings, and confusion due to contradictory advice, of varying quality, from healthcare providers (Compas et al., 2012; Smith et al., 2015). Similar to the child, parents and other family members might react

with shock, denial, anger, sadness, and/or anxiety following the child's diagnosis (Gannoni & Shute, 2010). Despite the challenges of raising a child with a chronic health condition, many parents become experts in the management and treatment of their child's condition and are able to help their child and family overcome many of these obstacles (Smith et al., 2015).

Chronic health conditions and their treatment place children and adolescents at a higher risk for behavioral, emotional, and psychological symptoms in comparison to their healthy peers (e.g., Compas et al., 2012; Taylor, Gibson, & Franck, 2008; Turkel & Pao, 2007). For example, children and adolescents diagnosed with a chronic health condition may experience social isolation or withdrawal due to feeling "different" from their peers, increased school absences, and limitations in activities of daily living, all of which contribute to poorer psychosocial functioning (Compas et al., 2012; Perrin, Gnanasekaran, & Delahaye, 2012). The onset of a chronic health condition can also interfere with building bonds with peers and experiencing important milestones with family and friends (Taylor et al., 2008). Children and adolescents with chronic health conditions sometimes exhibit angry and/or oppositional behaviors due to frustration with their conditions, which could interfere with medical treatments and increase their risk for poorer prognosis (Turkel & Pao, 2007). Additionally, some children and adolescents with chronic health conditions are psychologically affected or traumatized by medical treatments (Stuber, Schneider, Kassam-Adams, Kazak, & Saxe, 2006). The adverse effects of childhood and adolescent chronic health conditions and their treatments help to explain the demonstrated detrimental effect of chronic health conditions on overall quality of life (QoL; e.g., Bai, Herten, Landgraf, Korfage, & Raat, 2017; Centers for Disease Control and Prevention [CDC], 2009; Megari, 2013; National Center for Health Statistics, 2001; Rothrock et al., 2010).

## **Chronic Health Conditions during Emerging Adulthood**

Advancements in technology have allowed for more accurate diagnoses and better treatment options, resulting in more children and adolescents with chronic health conditions surviving into adulthood (Halfon & Newacheck, 2010; Mokkink, van der Lee, Grootenhuis, Offringa, & Heymans, 2008). Just a few decades ago, few children with severe chronic health conditions survived to the age of 20, and the transition from pediatric to adult healthcare was not considered an important focus of research (Blum et al., 1993). Now, approximately 90% of children with chronic health conditions will survive beyond their twenties (Scal, Evans, Blozis, Okinow, & Blum, 1999). Consequently, millions of individuals in their late teens and early twenties are currently living with chronic health conditions in the United States (Blum et al., 1993; Compas et al., 2012). With the increased survival rate of children and adolescents with chronic health conditions, it is important to examine the potentially unique impact chronic health conditions have on individuals' lives as they transition from adolescence into adulthood.

The transitional stage of life between adolescence and adulthood is often referred to as “emerging adulthood.” While there are varying age cut-offs for what constitutes emerging adulthood (e.g., Fry, 2017; Wood et al., 2018), for the purposes of the current study 18- to 25-year-olds were considered to be emerging adults (Arnett, 2000). Emerging adulthood is a distinct time that involves many changes, such as increased autonomy, discovery and development of one's personal identity, and potentially establishing independent living (Arnett, 2004, 2018; Goldscheider & Goldscheider, 1999). Some emerging adults move outside their family home following secondary education to establish independent living and begin a full-time career or pursue further education, while others continue to live inside their family home until marriage or financial stability is established (Goldscheider & Goldscheider, 1999). Currently, 32% of young

adults (age 18- to 34-years-old) live with their parents, making it the most common living arrangement for this age group (Fry, 2016). Another subset of emerging adults transition toward independent living and experience “semiautonomy” (Goldscheider & DaVanzo, 1986) as they move outside their family home, but still rely on their parents for certain responsibilities (Arnett, 2018; Goldscheider & Goldscheider, 1999). Although there is great diversity in emerging adults’ living situations, high instability remains a common theme (Arnett, 2018; Rindfuss, 1991), with 40% of emerging adults moving back in and then out of their family home at least once during their late teens and twenties (Goldscheider & Goldscheider, 1999). The instability of living situation reflects the overall uncertainty and exploration experienced throughout emerging adulthood. Emerging adults make many important discoveries during this transitional time as their personal identity continues to mature and they begin to develop long-term aspirations for adulthood (e.g., Arnett, 2018). Due to the cumulative stress of this highly uncertain transitional period of their lives, emerging adults may be at a greater risk of experiencing negative psychosocial consequences than other age groups (Dornbusch, 2000).

The transition from adolescence to adulthood is already a tumultuous experience (Arnett, 2018; Dornbusch, 2000; Goldscheider & Goldscheider, 1999), and having a chronic health condition may further complicate this transition (Blum et al., 1993). Emerging adults with chronic health conditions are more likely than their healthy peers to experience medical setbacks, impaired physical and/or mental functioning, and forced dependence (Turkel & Pao, 2007), which has the potential to negatively affect their psychosocial well-being and QoL (e.g., CDC, 2009). The complications of having a chronic health condition have been shown to put emerging adults at risk for lower educational and vocational attainment, as well as less permanent employment, than their healthy peers (Champaloux & Young, 2015; Maslow, Haydon, Ford, &

Halpern, 2011a; Maslow, McRee, Ford, & Halpern, 2011b). The majority of emerging adults with chronic health conditions still graduate high school (81%) and are employed (60%), but their healthy peers are graduating high school (90%) and gaining employment (72%) at higher rates (Maslow et al., 2011a). Greater psychosocial distress (e.g., CDC, 2009) and lower educational, vocational, and related financial attainment (Maslow et al., 2011a) are some of the unique struggles that emerging adults with chronic health conditions experience in becoming successful adults (Blum et al., 1993), and they are often significantly more burdensome than the struggles faced by healthy emerging adults. Despite these additional challenges, emerging adults with chronic health conditions are equally likely as their healthy peers to establish independent living outside the family home (Maslow et al., 2011b).

Many emerging adults with chronic health conditions are required to assume a greater amount of responsibility regarding their self-care as they transition into adulthood and seek more independence from their parents (Dovey-Pearce & Christie, 2013; Heath et al., 2017). Emerging adults often are expected to take primary responsibility for the self-management of their condition by scheduling their own appointments or procedures, following treatment regimens as directed, and carefully monitoring the status of their condition independently, when previously they could rely on their parents to complete or remind them to complete these tasks (Heath et al., 2017). The greater assumed responsibility may be associated with increased daily stress, which is known to exacerbate the symptoms and worsen the prognosis of chronic health conditions (e.g., Compas et al., 2012). To date, a great deal of research has been conducted on emerging adults with chronic health conditions as they transition from pediatric to adult healthcare services (e.g., Blum et al., 1993; Scal et al., 1999; Zhou, Roberts, Dhaliwal, & Della, 2016), but more research is necessary to understand the unique process of transitioning the context of medical care outside

the family home and engaging in more independent self-management for emerging adults with chronic health conditions.

### **Impact of Chronic Health Condition Status on Quality of Life**

Quality of life (QoL) encompasses one's comfort, health, and happiness (Felce & Perry, 1995), as well as one's individual evaluations of and reactions to the challenges, changes, and opportunities experienced in their lives (Diener, Suh, Lucas, & Smith, 1999). Individuals with chronic health conditions are at risk for lower QoL in comparison to their healthy peers (e.g., Bai et al., 2017; CDC, 2009; Megari, 2013; National Center for Health Statistics, 2001; Rothrock et al., 2010). Additionally, Rothrock and colleagues (2010) found that the greater the number of diagnosed chronic health conditions an individual is being treated for, the lower their QoL. Individuals who perceive their condition as more severe have also been shown to have poorer psychosocial well-being and QoL than individuals who perceive their condition as less severe (Leung et al., 2008). Research has shown that higher QoL is associated with better coping skills, better prognosis of one's conditions, and more satisfaction with life (e.g., CDC, 2009; Megari, 2013), which highlights the importance of promoting QoL, particularly for individuals with chronic health conditions.

Although chronic health conditions can disrupt many areas of life, children, adolescents, and emerging adults can find ways to adjust their daily lives to meet the challenges associated with their conditions (e.g., Charmaz, 1991; Sawyer et al., 2007), and resilience is common among individuals with chronic health conditions (Cal, de Sa, Glustak, & Santiago, 2014). Resilience is observed in individuals diagnosed with a chronic health condition, who show little or no signs of negative emotional, cognitive, or social adaptations (Rutter, 2006). Some individuals experience a significant amount of stress during and following their diagnosis, but a

supportive environment can buffer the negative impact of their chronic health conditions on QoL (Cal et al., 2014). Specifically, a healthy and stable family environment that provides emotional and social support could potentially buffer the additional stress that emerging adults with chronic health conditions experience as they assume greater responsibility for the self-management of their healthcare (Perez, 1997; Ryan & Sawin, 2009). Additionally, higher self-esteem, in combination with a supportive family environment, can help to promote better coping skills, higher QoL, and a more successful adjustment to the stress of living with a chronic health condition (Griva et al., 2000; Jerusalem & Schwarzer, 1993)

### **Perceived Health Competence**

Perceived health competence (PHC), or the degree to which one feels capable of effectively managing their health outcomes (Smith, Wallston, & Smith, 1995), is a potentially important protective factor against the negative impact of the stress associated with assuming greater responsibility for one's own healthcare during emerging adulthood. PHC is a form of self-efficacy, which is broadly defined as one's perception of their own abilities (Bandura, 1997). Individual differences in perceived self-efficacy have been shown to be better predictors of outcomes than previous ability (Bandura, 1997), and appear to be particularly important when individuals face adversity, such as being diagnosed with a chronic health condition (Luszczynska, Gutierrez-Dona, & Schwarzer, 2005). More broadly, self-efficacy has been shown to predict medication adherence, health behaviors, and disease management (e.g., Bar-Mor, Bar-Tal, Krulik, & Zeevi, 2000; Es et al., 2002; Luszczynska et al., 2005; Ott, Greening, Palardy, Holderby, & DeBell, 2000). Individuals with higher self-efficacy may have better coping skills to more effectively handle difficult or unexpected situations encountered due to their condition (Griva et al., 2000; Jerusalem & Schwarzer, 1992). Higher self-efficacy and more adaptive

coping skills have been shown to reduce stress and enhance positive emotions (Bandura, 1997). Individuals with poor self-efficacy have been shown to be at a higher risk of suffering distress and negative emotions (e.g., anxiety and depression) in response to stressful situations, such as living with a chronic health condition (Griva et al., 2000; Jerusalem & Schwarzer, 1992).

Self-efficacy is an important cognitive factor affecting general health status (O’Leary, 1985), and research suggests that low self-efficacy is associated with poorer coping skills, poor disease management, and lower QoL for individuals with chronic health conditions (Griva et al., 2000; Jerusalem & Schwarzer, 1992; Luszczynska et al., 2005). However, the majority of these studies utilized a disease-specific approach that did not allow for generalizations across conditions. Additionally, these studies primarily used a measure of general self-efficacy, rather than a measure of self-efficacy as it relates to the management of one’s own healthcare, such as PHC. There is emerging evidence to suggest that low PHC may be associated with an increased risk for poorer coping skills and lower QoL among individuals with chronic health conditions (Bachmann et al., 2016; Cramm et al., 2013; van Empelen, Jennekens-Schinkel, van Rijen, Helders, & van Nieuwenhuizen, 2005); however, this relationship requires further investigation.

### **Individual and Family Self-Management Theory**

Acceptance and support of one’s condition from family, friends, and healthcare providers have been shown to be important factors promoting higher QoL of children and adolescents with chronic health conditions (Berntsson, Berg, Brydolf, & Hellstrom, 2005). Additionally, Heath and colleagues (2017) found that parents are important facilitators of their child’s healthcare transition as they enter adulthood and can support their child to become experts in his or her own condition. Emerging evidence suggest that parents may play a key role in reducing stress and promoting higher QoL as emerging adults assume a larger role in their own healthcare (Heath et

al., 2017), potentially through the promotion of their children's health competence. In order to be effective facilitators in this process, parents may need to adjust their behaviors, responsibilities, and roles to support their child's growing independence (Heath et al., 2017). Parents need to embrace the role of "partner," rather than parent, in order to promote their child's health competence and share responsibility of the healthcare management process with their child in a state of inter-dependence, as a bridge to full independence (Kieckhefer, Trahms, Churchill, & Simpson, 2009).

The theory of individual and family self-management (Ryan & Sawin, 2009) helps explain the importance of parental support for emerging adults with chronic health conditions. Self-management is the process of using self-regulation strategies to manage chronic health conditions (Holroyd & Creer, 1986) and differs from self-care, which refers to the performance of daily living activities (Newman, Steed, & Mulligan, 2004). Individual and family self-management involves purposeful incorporation of health-related behaviors into the daily routines of an individual and his or her family (Ryan & Sawin, 2009). Self-management is an ongoing process of collaboration between children, adolescents, and emerging adults with chronic health conditions and their parents to achieve control of their condition, health, and overall well-being (Ryan & Sawin, 2009), which in turn can promote higher health competence. By first implementing family self-management, then transitioning to individual self-management, parents may be able to encourage a gradual increase in their children's health competence as they begin to seek greater independence from their parents. The ultimate goal of increasing emerging adults' responsibility for self-management and promoting their health competence is to develop the necessary skills for a successful transition into adulthood and independent living (Sawin, Bellin, Roux, Buran, & Brei, 2009).

## **The Current Study**

Substantial research has been conducted on emerging adults with chronic health conditions as they transition from pediatric to adult healthcare services (e.g., Blum et al., 1993; Scal et al., 1999; Zhou et al., 2016). However, there is a paucity of research on the process of transitioning the context of medical care outside the family home, establishing independent adult living, and engaging in more independent self-management for emerging adults with chronic health conditions. More research is necessary to understand the potentially crucial role of health competence in promoting higher QoL and reducing the stress associated with the transition into adulthood for these emerging adults. Additionally, the role of parental support in condition management before, and during, the transitional period of emerging adulthood requires further investigation. The current study aimed to further assess the impact of health competence, chronic health condition status (including comorbidity and perceived control of symptoms), current living situation, and parental support on QoL in a community emerging adult sample.

For primary analyses, the relationship between PHC, chronic health condition status, current living situation, and QoL was investigated. It was hypothesized that emerging adults who reported having one or more chronic health conditions would have lower QoL than their healthy peers. Further, it was hypothesized that emerging adults with higher PHC would demonstrate higher QoL. Additionally, it was hypothesized that chronic health condition status would moderate the proposed relationship between PHC and QoL. Specifically, it was hypothesized that emerging adults with chronic health conditions would demonstrate a greater increase in QoL with higher PHC in comparison to emerging adults without chronic health conditions. It was also hypothesized that current living situation would act as a second moderator on the previously proposed relationship, such that emerging adults living outside the family home would

demonstrate a greater increase in QoL with higher PHC in comparison to emerging adults living inside the family home. Overall, a three-way interaction was hypothesized between PHC, chronic health condition status, and current living situation on the dependent variable of QoL. It was hypothesized that emerging adults with chronic health conditions, who are living outside the family home would demonstrate the greatest increase in QoL with higher PHC; and that emerging adults without chronic health conditions, who are living inside the family home would demonstrate the least increase in QoL with higher PHC.

Exploratory analyses investigated differences in the relationship between PHC and QoL for the subgroup of emerging adults with chronic health conditions. Specifically, the impact of the following variables was investigated: comorbidity of conditions; perceived control of condition symptoms; presence of parental support (any form, financial, emotional, and instrumental) in managing the conditions; and satisfaction with the degree of parental support received in managing the conditions. It was hypothesized that emerging adults with one chronic health condition would demonstrate higher QoL in comparison to those with two or more conditions. Further, it was hypothesized that emerging adults with well controlled chronic health condition symptoms would demonstrate higher QoL in comparison to those with poorly controlled condition symptoms. It was also hypothesized that emerging adults who were receiving parental support (regardless of form) in managing their conditions would demonstrate higher QoL in comparison to those who were not receiving parental support. Additionally, it was hypothesized that emerging adults who reported satisfaction with the degree of parental support received in managing their chronic health condition would demonstrate higher QoL than those who reported dissatisfaction. Finally, it was hypothesized that each of these independent variables would moderate the originally proposed relationship between PHC and QoL.

## Methods

### Participants

All participants were required to be between the ages of 18 and 25, be English-speaking, and have access to a device that could connect to the internet. There were no specific exclusion criteria for participation.

Over the course of four academic semesters, 1,191 emerging adults participated in the larger online survey. All elements of the current project were completed by 929 of these emerging adults. The completion rate for the current study (78%) is similar to that of previous semesters of data collection through a similar procedure (80%) and was anticipated prior to the onset of data collection.

The sample had a mean age of 22.19 years ( $SD=1.95$ ). The majority of participants were female (55%), Caucasian/White (73%), and single, never married (93%). Eighty-five percent of emerging adults had at least some college education and 59% were currently full- or part-time college students. Almost three-fourths of participants reported living outside the family home (72%), with roommates (37%), with a spouse or romantic partner (17%), alone (13%), or with another family member (not parent; 4%). Twenty-eight percent of emerging adults reported living inside the family home with one or both parents. Demographic data for all emerging adult participants are presented in Table 1.

Three-hundred and twenty-eight emerging adults (35%) reported having one or more chronic health conditions. Of the emerging adults with a chronic health condition, 35% reported having two or more conditions. The most commonly reported chronic health conditions were asthma (32%), anxiety (27%), depression (21%), food allergy (12%), attention-deficit/hyperactivity disorder (ADHD; 11%), obesity (9%), and other (13%). There was a wide

variety of “other” conditions reported, including bipolar disorder, cystic fibrosis, endometriosis, hypo/hyperthyroidism, and psoriasis. Sixty-one percent of emerging adult participants reported only having physical health conditions and 27% reported only having mental health conditions, while 12% reported having both physical and mental health conditions. Prevalence of specific chronic health conditions represented in the sample are presented in Table 2.

There was a significant difference in the proportion of females in the subgroup of participants with one or more chronic health conditions (67%) and the proportion of females in the subgroup of participants without a chronic health condition (49%),  $\chi^2=27.79$ ,  $p<.001$ . There were no significant differences in age, race/ethnicity, marital status, education level, student status, or living situation between these two subgroups of participants (all  $p>.05$ ).

## **Procedure**

*Data Collection Procedure.* The procedure for recruitment and data collection for the larger survey was approved each semester by the University’s Institutional Review Board (IRB). For Spring 2017, data was collected through surveymonkey.com, and for Summer 2017, Fall 2017, and Spring 2018, data was collected through Qualtrics. The procedure for recruitment and the format of the online survey remained the same across platforms and semesters. Graduate and undergraduate students in an upper level psychology laboratory course were trained in the ethical conduct of research prior to recruiting community emerging adults to participate in the larger online survey. If students were unable to recruit a sufficient number of participants, they were allowed to complete an alternative assignment in order to minimize incentive to coerce participation. Students provided potential participants with a one-page informed consent sheet, which explained the purpose of the larger study, ensured confidentiality, reminded individuals that their participation was completely voluntary, and included the link to the online survey.

Before completing the survey, participants were required to indicate (on surveymonkey.com/Qualtrics) that they were at least 18-years-old, were participating voluntarily, and understood that the student who recruited them would not be penalized if they decided not to participate.

Participants provided demographic information (including presence/absence of a chronic health condition and current living situation) and completed the Perceived Health Competence Scale (PHCS; Smith et al., 1995) and the Patient-Reported Outcomes Measurement Information System Scale v.1.2 – Global Health (PROMIS – Global Health; Hays, Bjorner, Revicki, Spritzer, & Cella, 2009) as part of the larger online survey. Participants who reported having one or more chronic health conditions were asked a subset of additional quantitative and qualitative questions regarding the management of their conditions. All responses were collected anonymously. The larger online survey included approximately 200 items regarding participants’ mental, physical, and social well-being, and typically took 30 to 45 minutes to complete. The portion of the larger survey that was pertinent to the current study took approximately 15 to 20 minutes to complete.

## **Measures**

Community emerging adults completed the following measures as part of the larger online survey.

*Demographic Information.* Participants provided demographic information, including age, gender, race/ethnicity, marital status, education level, and student status.

*Demographics – Current Living Situation.* Participants were asked to choose one of the following options to describe their current living situation: “live with one parent”; “live with both parents”; “live with another family member (not parent)”; “live alone”; “live with roommate(s)”; “live with spouse/romantic partner”; or “other (please specify).” For the purpose

of the current study, participants who selected “live with one parent” or “live with both parents” were categorized as living inside the family home. Participants who select “live with another family member (not parents),” “live alone,” “live with spouse/romantic partner,” or “live with roommates,” were categorized as living outside the family home. Responses to “other (please specify)” were analyzed using the Delphi coding method (Holey, Feeley, Dixon, & Whittaker, 2007; detailed below), with inside the family home and outside the family home as the two categories used for coding.

*Demographics – Chronic Health Condition.* Participants were also asked, “Do you have a chronic medical condition (check all that apply)?” Emerging adult participants were allowed to select all that applied from the following 18 chronic health conditions: “ADHD”; “anxiety”; “arthritis/rheumatological condition”; “asthma”; “cancer/cancer survivor”; “celiac disease”; “chronic headache/migraine”; “depression”; “diabetes (Type 1)”; “diabetes (Type 2)”; “eating disorder”; “epilepsy/seizure disorder”; “food allergy”; “heart disease”; “inflammatory bowel disease”; “obesity”; “recurrent abdominal pain/irritable bowel syndrome”; and “sickle cell disease/blood disorder.” If participants had a chronic health condition that was not included in the checklist of 18 conditions, they were allowed to select “other (please specify).” Responses to “other (please specify)” were analyzed using the Delphi coding method (Holey et al., 2007). For primary data analyses, participants were grouped based upon presence of one or more chronic health conditions or absence of a chronic health condition.

*Chronic Health Condition Follow-Up.* Participants who reported having one or more chronic health conditions were asked a few brief follow-up questions regarding their conditions. Participants were asked to indicate their perception of how well controlled the symptoms of their conditions were on a scale from 1 being “very poorly controlled” to 5 being “very well

controlled.” For exploratory data analyses, responses of 1, 2, or 3 were considered “poorly controlled” and responses of 4 or 5 were considered “well controlled.” Participants were also asked if they currently were seeing a physician or other provider for their conditions and allowed to select one of the following three response options: “Have a chronic condition, but not under the care of a provider”; “Under the care of the provider I saw as an adolescent”; or “Under the care of a new provider since I became an adult.”

*Parental Support in Managing Chronic Health Conditions.* In Spring 2017 and Summer 2017, participants with one or more chronic health conditions were asked to indicate either “Yes” or “No” regarding if they received support from one or both of their parents in managing their chronic health conditions. If participants selected “Yes,” they were asked to provide a qualitative explanation of the parental support received and these responses were analyzed using the Delphi coding method (Holey et al., 2007). Thirteen forms of parental support were identified: “general financial support”; “provide health insurance”; “assist with medication co-pays”; “assist with co-pays for appointments/procedures”; “provide gas/transportation money to get to appointments”; “provide ride to appointments”; “pick up medications/supplies”; “provide money for health foods”; “prepare food/meals”; “schedule appointments”; “run errands”; “provide emotional support”; “provide information/advice on managing condition.”

In Fall 2017 and Spring 2018, participants were presented with a list of the previously identified forms of parental support (excluding “general financial support”) and were asked to select all that applied regarding the management of their chronic health conditions. Participants were also allowed to select “other (please specify)” if they received other forms of parental support not provided in the checklist. The qualitative responses for “other (please specify)” were coded using the Delphi coding method (Holey et al., 2007). Responses regarding parental

support mapped onto three forms of parental assistance: financial, emotional, and instrumental. For exploratory analyses, the differential effects of the presence of any form of parental support, as well as the presence of each of these three specific forms of parental support, were investigated using the data collected via checklist during the Fall 2017 and Spring 2018 semesters.

Additionally, in Fall 2017 and Spring 2018, participants were asked to indicate on a scale from 0 being “not at all satisfied” to 10 being “perfectly satisfied,” their level of satisfaction with the degree of support received from their parents in managing their chronic health conditions, regardless of whether or not they reported receiving parental support.

*Perceived Health Competence Scale (PHCS).* The Perceived Health Competence Scale (PHCS; Smith et al., 1995) was used as the measure of PHC. The PHCS has been shown to have high internal consistency ( $\alpha=0.86$ ) and high test-retest reliability ( $r=0.76$ ). This eight-item scale measures the degree to which an individual feels capable of effectively managing his or her health outcomes. Some example items include, “I’m generally able to accomplish my goals with respect to my health” and “I am able to do things for my health as well as most other people.” All items were answered on a five-point Likert scale from 1 being “strongly disagree” to 5 being “strongly agree.” A total PHC score was calculated by summing the responses to all eight items, after four items were reverse-scored. PHC scores ranged from 8 to 40 with higher scores indicating a stronger perception of health competence.

*Patient-Reported Outcomes Measurement Information System Scale v.1.2 – Global Health (PROMIS – Global Health).* The Patient-Reported Outcomes Measurement Information System Scale v.1.2 – Global Health (PROMIS – Global Health; Hays et al., 2009) is a 10-item, person-centered measure that evaluates one’s global health status based on two domains: mental

health and physical health. The PROMIS – Global Health has high test-retest reliability ( $r=0.80$ ) and has been shown to be valid with the general population, as well as with individuals with chronic health conditions. The PROMIS – Global Health also has high internal consistency ( $\alpha=0.91$ ). For the current study, a single item from the mental health domain of the PROMIS – Global Health was used for data analyses as the measure of QoL. Participants were asked to respond on a 5-point Likert scale, from 1 being “poor” to 5 being “excellent,” to the following prompt: “In general, would you say your quality of life is...” Higher scores on this item are indicative of higher QoL.

### **Data Analyses**

Statistical analyses were computed using IBM Statistical Package for the Social Sciences (SPSS) 25.0 Software (IBM Corp, 2017). All data were exported to SPSS from surveymonkey.com or Qualtrics. Qualitative data was coded using the Delphi coding method (Holey et al., 2007) and entered by category (1=presence of category; 0=absence of category) into SPSS. The sample was characterized using descriptive statistics. A  $p$ -value of  $<.05$  was used to determine the significance of results.

*Missing Data.* Any participant who did not answer the demographic questions related to presence/absence of a chronic health condition and current living situation were excluded from data analyses. Any participant with more than 37.5% (3 out of 8) of the items unanswered on the PHCS, were also excluded. Finally, any participants who did not respond to the QoL item from the PROMIS – Global Health were excluded from data analyses. Two-hundred and sixty-two participants were excluded from data analyses for the previously stated reasons. Any participant with 3 or less unanswered items on the PHCS, had missing responses imputed based upon averages of responses provided.

*Delphi Coding of Qualitative Responses.* All qualitative responses were coded using the Delphi coding method (Holey et al., 2007). Study members coded responses for each item to 85% agreement. In order to determine categories, study team members created a list of categories of participants' responses for each of the questions analyzed. The study team then collectively decided which categories to use for coding. Some questions utilized predetermined categories (stated above). Using the agreed upon final categories, each study team member independently coded the individual qualitative responses for either presence (1) or absence (0) of each category. Independent codes were compiled and compared across study team members and items that were not at 85% agreement or higher for any category were discussed as a group to reach acceptable agreement.

*Hypothesis Testing.* A hierarchical multiple regression analysis was conducted to assess the ability of PHC, chronic health condition status, and current living situation to predict QoL. Preliminary analyses found that there were no violations of the homoscedasticity, linearity, and multicollinearity assumptions for multiple regression analysis. However, the residuals of the regression were not normally distributed, Kolmogorov-Smirnov=.09,  $p<.001$ . Natural log, square root, and standardized transformations did not correct for this violation of the normality assumption for multiple regression analysis (all  $p<.001$ ), so the original PHC scores were used for data analyses. PHC was centered based on the mean PHC score for the full emerging adult sample ( $M=29.25$ ,  $SD=5.52$ ). Gender, chronic health condition status, and current living situation were dummy coded for the purposes of this analysis. Two-way and three-way interactions were calculated by multiplying the mean-centered and dummy coded independent variables.

There were four steps for the primary hierarchical multiple regression analysis. Since there was a significant difference in the proportion of females based on chronic health condition

status, this analysis controlled for gender in step one. PHC, chronic health condition status, and current living situation were entered in step two. All two-way interactions between the three independent variables were entered in step three. Finally, the three-way interaction between PHC, chronic health condition status, and current living situation was entered in step four. Any statistically significant two-way or three-way interactions were followed up with post-hoc hierarchical multiple regression analyses to further characterize the relationship between PHC, chronic health condition status, current living situation, and QoL. A post hoc power analysis, performed using G\*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009; Faul, Erdfelder, Lang, & Buchner, 2007), indicated that the observed power to detect significant relationships for the primary analyses was 1.00.

*Exploratory Analyses for Full Emerging Adult Sample.* Following the primary data analyses, additional exploratory analyses were conducted with the full emerging adult sample to further characterize the relationship between PHC, chronic health condition status, current living situation, and QoL. For these analyses, PHC was examined as a categorical (low, medium, and high categories) variable, rather than continuous, to detect more nuanced group differences in QoL based on chronic health condition status and current living situation. The cut-off scores for these groupings were determined by the 33<sup>rd</sup> and 67<sup>th</sup> percentiles of PHC scores for the full emerging adult sample and do not necessarily translate into true low, medium, and high PHC scores of the larger population. Differences between mean QoL for the four subgroups of participants (based on chronic health condition status and current living situation) were examined across low, medium, and high PHC to determine if the relationship between PHC and QoL was influenced by chronic health condition status and/or current living situation.

*Exploratory Analyses for Emerging Adults with Chronic Health Conditions.* The following exploratory analyses were conducted within the group of emerging adults who reported having one or more chronic health conditions. Exploratory analyses investigated the effect of comorbidity of chronic health conditions, perceived control of chronic health condition symptoms, and parental support (any form, financial, emotional, and instrumental) received in managing one's chronic health condition on the relationship between PHC and QoL. All six exploratory independent variables were dummy coded. Using six separate hierarchical multiple regression analyses, each of the six exploratory independent variables (comorbidity, perceived symptom control, any parental support, financial parental support, emotional parental support, and instrumental parental support) were entered in step one, along with PHC (mean-centered based on full sample). Two-way interactions were entered in step two. Additionally, another hierarchical multiple regression was conducted to examine the impact of any parental support received in managing their chronic health condition and satisfaction with parental support received on the relationship between PHC and QoL. These hierarchical multiple regression analyses examined the ability of all independent variables (step one), two-way interactions (step two), and three-way interactions (step three) to predict QoL. For all exploratory analyses, any significant two-way or three-way analyses were followed up using post-hoc hierarchical multiple regression analyses to further characterize the relationship between PHC, the independent variable(s) being analyzed, and QoL.

## **Results**

### **Descriptive Statistics**

*Management of Chronic Health Conditions.* The following descriptive statistics are reported regarding the 328 emerging adult participants who reported having one or more chronic

health conditions. The majority of participants reported that the symptoms of their condition were well or very well controlled (53%) and only 2% of emerging adults reported that the symptoms of their condition were very poorly controlled (see Figure 1). Additionally, 71% of emerging adults with one or more chronic health conditions reported that they were currently under the care of a provider; however, over one-fourth (29%) of participants reported that they had a chronic health condition, but were not currently under the care of a provider (see Figure 2).

*Parental Support in Managing Chronic Health Conditions.* There was significantly less parental support endorsed for the two semesters in which participants were required to qualitatively describe the parental support they received in managing their conditions (25%; Spring 2017 and Summer 2017), in comparison to the two semesters in which a checklist of forms of parental support were provided (75%; Fall 2017 and Spring 2018). The checklist responses were assumed to be more representative of the degree of parental support received and the following descriptive statistics are based upon the subgroup of participants with chronic health conditions from the Fall 2017 and Spring 2018 semesters ( $n=186$ ).

Sixty-five percent of participants reported they received parental financial support, 60% reported they received parental emotional support, and 42% reported they received parental instrumental support. Additionally, 36% of emerging adults reported that they received all three forms of parental support (emotional, financial, and instrumental) in managing their conditions. The most commonly reported subtypes of parental support received included insurance (61%), general emotional support (59%), paying for medications (40%), providing advice on the management of chronic health conditions (38%), and paying for appointments (37%). See Table 3 for the frequency of each of the specific forms of parental support received in managing chronic health conditions.

A majority of participants with one or more chronic health conditions reported being satisfied (reported a 6 or higher on the 11-point Likert scale) with the support received from their parents in managing their condition (75%), with 40% of emerging adults reporting that they were perfectly satisfied (reported a 10 out of 10 on Likert scale) with the degree of support received from their parents. However, 6% of respondents indicated that they were not at all satisfied (reported a 0 out of 10 on Likert scale) with the degree of support received from their parents in managing their condition. See Figure 3 for the distribution of satisfaction with parental support received.

### **Primary Hierarchical Multiple Regression Analyses**

#### *Impact of PHC, Chronic Health Condition Status, and Current Living Situation on QoL.*

After controlling for gender in step one, step two of the primary hierarchical multiple regression analysis revealed a statistically significant association between the three independent variables (PHC, chronic health condition status, and current living situation), as a set, and QoL (see Table 4). Combined, PHC, chronic health condition status, and current living situation accounted for 24% of the variance in QoL in this model. PHC and chronic health condition status had significant unique contributions in predicting QoL; however, current living situation did not. PHC was significantly positively associated with QoL, such that higher PHC was associated with higher QoL. Additionally, CHC status was significantly negatively associated with QoL, such that those with a chronic health condition demonstrated lower QoL than those without a chronic health condition. There were no significant differences in QoL scores based on current living situation.

Results of step three of the primary hierarchical multiple regression analysis showed that the two-way interaction between PHC and chronic health condition status significantly positively

predicted QoL. However, step three, which included all two-way interactions between the three independent variables, only accounted for minimal additional variance in QoL ( $\Delta R^2=.005$ ) beyond what was already accounted for by the three independent variables in step two. The significant two-way interaction in step three was followed up with post-hoc analyses that examined the impact of PHC and current living situation on QoL within the subgroup of emerging adults without a chronic health condition and within the subgroup of emerging adults with a chronic health condition (see Table 5). Results from these post-hoc analyses showed that PHC had a significant unique contribution in predicting QoL for emerging adults without a chronic health condition and for emerging adults with one or more conditions. Higher PHC was predictive of higher QoL for both subgroups of emerging adults. Current living situation did not have a significant unique contribution in predicting QoL for either subgroup of participants. For emerging adults without a chronic health condition, PHC and current living situation demonstrated an association with QoL of medium effect size ( $\Delta R^2=.19$ ), while for emerging adults with one or more chronic health conditions, PHC and current living situation demonstrated an association with QoL of large effect size ( $\Delta R^2=.28$ ).

Gender, which was controlled for in these analyses, was not significantly associated with QoL and accounted for less than .25% of the variance in QoL for the primary and post-hoc hierarchical multiple regression analyses. For the primary hierarchical multiple regression analysis, the three-way interaction between PHC, CHC status, and current living situation was added into step four. This three-way interaction also was not significantly associated with QoL and did not account for any significant additional variance in QoL ( $\Delta R^2<.001$ ) beyond the variance accounted for by the three independent variables in step two.

## **Exploratory Analyses for Full Emerging Adult Sample**

In order to further investigate more nuanced influences of chronic health condition status and current living situation on the relationship between PHC and QoL, additional analyses were conducted that examined PHC as a categorical, rather than continuous, variable. By comparing mean QoL for the four subgroups of emerging adults based on chronic health condition status and current living situation, across the three levels of PHC (see Table 6), it was found that all four subgroups of emerging adults demonstrated a positive association between PHC and QoL (see Figure 4). However, emerging adults with one or more chronic health conditions demonstrated a different relationship between PHC and QoL than their healthy peers, regardless of current living situation. For emerging adults with chronic health conditions, there was a significant difference in QoL from low to medium PHC (mean difference=1.01,  $p<.001$ ), and medium to high PHC (mean difference=.29,  $p<.05$ ), such that QoL was highest for high PHC and QoL was lowest for low PHC. For emerging adults without a chronic health condition, there was no significant difference in QoL from low to medium PHC (mean difference=.10,  $p>.05$ ); however, there was a significant difference in QoL from medium to high PHC (mean difference=.68,  $p<.001$ ). Additionally, at low PHC, emerging adults with chronic health conditions reported significantly lower QoL than emerging adults without chronic health conditions, regardless of current living situation (mean difference=.54,  $p<.001$ ). There were no significant differences between the four subgroups of emerging adults at medium and high PHC.

## **Exploratory Analyses for Emerging Adults with One or More Chronic Health Conditions**

The following exploratory analyses were run within the subgroup of emerging adult participants who reported having one or more chronic health conditions to further characterize the relationship between PHC and QoL for these emerging adults.

*Comorbidity of Chronic Health Conditions.* First, a hierarchical multiple regression analysis was conducted to examine the impact of comorbidity of chronic health conditions on the relationship between PHC and QoL (see Table 7). Results from step one of this analysis found that PHC had a significant unique contribution in predicting QoL. Higher PHC was predictive of higher QoL. However, comorbidity of conditions did not significantly predict QoL. Emerging adults with one chronic health condition had similar QoL to emerging adults with two or more conditions. As a set, PHC and comorbidity accounted for 28% of the variance in QoL. The two-way interaction between PHC and comorbidity did not significantly account for any additional variance in QoL ( $\Delta R^2=.003$ ) beyond that accounted for in step one.

*Control of Chronic Health Condition Symptoms.* Another hierarchical multiple regression analysis investigated the effect of perceived control of chronic health condition symptoms on the relationship between PHC and QoL (see Table 8). PHC and perceived control of symptoms as a set accounted for 28% of the variance in QoL. Both PHC and perceived control of symptoms had significant unique contributions in predicting QoL. Higher PHC was predictive of higher QoL. Emerging adults with well controlled symptoms had higher QoL than emerging adults with poorly controlled symptoms. The two-way interaction between PHC and perceived control of symptoms did not account for additional variance in QoL ( $\Delta R^2=.003$ ) beyond that accounted for in step one and was not significantly predictive of QoL.

*Parental Support Received in Managing Chronic Health Conditions.* The following exploratory analyses were only conducted within the subgroup of emerging adult participants who indicated the presence of parental support via a checklist (Fall 2017 and Spring 2018). Results from four separate hierarchical multiple regression analyses regarding the impact of any form parental support (emotional, financial, and/or instrumental), emotional parental support,

financial parental support, and instrumental parental support on QoL produced similar findings (see Table 9). For all four analyses, PHC and parental support (any, emotional, financial, and instrumental support), accounted for 23-25% of the variance in QoL. PHC was significantly positively predictive of QoL across all four hierarchical multiple regression analyses. Across analyses, presence of parental support did not demonstrate any unique contribution in predicting QoL, indicating that emerging adults who reported receiving parental support had similar QoL to emerging adults who reported not receiving parental support. The two-way interactions between PHC and each of the four forms of parental support did not significantly predict QoL and accounted for only minimal additional variance in QoL ( $\Delta R^2 < .05$ ) beyond what was already accounted for in step one by PHC and each of the four forms of parental support examined.

A hierarchical multiple regression analysis was also conducted to evaluate the ability of PHC, any form of parental support, and satisfaction with parental support received to predict QoL. Results from this analysis demonstrated that PHC, parental support, and satisfaction with support received, as a set, accounted for 27% of the variance in QoL. PHC and satisfaction with support received had significant unique contributions in predicting QoL. PHC was significantly positively associated with QoL. Additionally, satisfaction with support received was significantly positively associated with QoL, such that higher satisfaction with parental support received was associated with higher QoL. However, parental support did not have significant unique contributions in predicting QoL in this model. Additionally, the two-way and three-way interactions analyzed did not significantly predict QoL and accounted for minimal additional variance in QoL ( $\Delta R^2 < .01$ ) beyond that accounted for in step one by the independent variables.

## Discussion

### Results of Hypothesis Testing

*Impact of Chronic Health Condition Status on QoL.* Consistent with the previous literature (e.g., Bai et al., 2017; CDC, 2009; Megari, 2013; National Center for Health Statistics, 2001; Rothrock et al., 2010), and the proposed hypothesis, chronic health condition status was predictive of QoL. Emerging adults with one or more chronic health conditions reported lower QoL in comparison to their healthy peers. Previous research also suggested that the more diagnosed chronic health conditions an individual was receiving treatment for, the lower their QoL (Rothrock et al., 2010), but this was not supported by the findings of the current study. However, perceived control of chronic health condition symptoms differentiated emerging adults' reported QoL. Emerging adults with well controlled symptoms demonstrated higher QoL than emerging adults with poorly controlled symptoms. Poor control of condition symptoms (Compas et al., 2012; Marin et al., 2009) and greater perceived severity of one's condition (Leung et al., 2008) have been shown to be associated with additional physical and psychological stress that may help explain the relationship between lower perceived control of condition symptoms and lower QoL found in the current study. Overall, these results suggest that the presence of a chronic health condition is an important factor that is negatively associated with QoL, and that perceived control of condition symptoms may differentiate the strength of this negative association across emerging adults with one or more chronic health conditions.

*Impact of PHC on QoL.* The hypothesis that emerging adults with higher PHC would demonstrate higher QoL was consistently supported by the results of the current study. This finding adds to the emerging evidence in the literature regarding the presence of a positive association between PHC and QoL (Bachmann et al., 2016; Cramm et al., 2013; van Empelen et

al., 2005). Across primary and exploratory analyses, PHC demonstrated significant unique contributions in predicting QoL, such that higher PHC was predictive of higher QoL. Besides PHC, only two other independent variables investigated (chronic health condition status and perceived control of chronic health condition symptoms) were significantly predictive of QoL. Adding PHC, along with the other independent variables, to the regression models consistently accounted for approximately one-fourth of the variance in QoL. Since PHC had significant unique contributions in predicting QoL across analyses, but the other independent variables primarily did not have significant unique contributions in predicting QoL, it can be concluded that the impact of PHC accounted for a greater amount of the variance in QoL across analyses, than the other independent variables being analyzed. Taken together, these results suggest that the positive association between PHC and QoL is present across the emerging adult sample; however, the nature of the positive association varies, in part, due to the moderating factors of chronic health condition status and perceived control of chronic health condition symptoms.

*Impact of Current Living Situation on QoL.* Current living situation was not a significant predictor of QoL, contrary to the initial hypothesis. Although small deficits in QoL were observed in the emerging adults who were living inside the family home in comparison to emerging adults living outside the family home, these differences were not statistically significant. Potentially, the high instability of living situations during emerging adulthood (Arnett, 2018; Rindfuss, 1991), confounds the potential influence of current living situation on QoL. There are many different possible living situation during emerging adulthood and differential impact on QoL may be observed when examining a wider range of current living situations, rather than just inside the family home in comparison to outside the family home. Additionally, other factors, such as presence of social support (parental or otherwise), have been

proven to be significant predictors of QoL (Griva et al., 2000; Jerusalem & Schwarzer, 1993), and may be more important predictors of QoL than current living situation, although these two variables are likely highly correlated, with certain living situations supporting greater social support than others (Cal et al., 2014).

*Interaction between PHC, Chronic Health Condition Status, and Current Living Situation.* The hypothesized three-way interaction between PHC, chronic health condition status, and current living situation on QoL was not supported by the results of the current study. However, there was a significant two-way interaction between PHC and chronic health condition status on QoL, suggesting that the positive association between PHC and QoL, in part, depends on chronic health condition status. It was found that, for emerging adults without a chronic health condition, the positive association between PHC and QoL was only present from medium to high PHC. However, for emerging adults with one or more chronic health conditions, the positive association between PHC and QoL was consistently present from low to high PHC. Of note, the QoL of emerging adults with chronic health conditions only significantly differed from the QoL of emerging adults without chronic health conditions at low PHC, suggesting that low PHC in combination with having a chronic health condition may place emerging adults at greater risk for lower QoL, in comparison to their healthy peers. Taken together, these findings suggest that the positive association between PHC and QoL, at least in part, depends on chronic health condition status.

*Parental Support Received in Managing Chronic Health Conditions.* Presence of parental support in managing one's chronic health condition was not a significant predictor of QoL across analyses. However, it was found that emerging adults who were satisfied with the degree of parental support received reported higher QoL than emerging adults who were dissatisfied,

regardless of the presence of parental support. These results suggest that QoL is not necessarily affected by the presence of parental support, rather satisfaction with parental support received was much more influential on promoting emerging adults' QoL. Lower satisfaction with life has been shown to be associated with poorer prognosis of one's condition and lower QoL (e.g., CDC, 2009; Megari, 2013). As satisfaction with parental support received may influence overall satisfaction with life, the results of this study highlight the importance of determining factors that may influence emerging adults' satisfaction with receiving parental support in managing their chronic health conditions. Although there was no significant two-way interaction between health competence and satisfaction with support, other health-related skills, such as advanced individual self-management abilities (Sawin et al., 2009) may allow for certain emerging adults with chronic health conditions to thrive without the support of their parents.

### **Relation to Previous Literature**

Previous research has shown that self-efficacy is an important cognitive factor affecting general health status (O'Leary, 1985), and that low self-efficacy is associated with poorer coping skills, poorer prognosis of one's condition, and lower QoL (e.g., Griva et al., 2000; Jerusalem & Schwarzer, 1992; Luszczynska et al., 2005). However, the majority of the research in this area was conducted using a disease-specific approach and a measure of general self-efficacy. These methodologies do not offer comparisons across conditions and do not specifically evaluate the impact of one's health-related self-efficacy on the outcome variables. However, there is a small body of literature to suggest that higher health competence, a specific form of self-efficacy that relates to one's abilities to manage their own healthcare (Smith et al., 1995), is associated with higher QoL for individuals with chronic health conditions (Bachmann et al. 2016, Cramm et al.,

2013, van Empelen et al., 2005). The results of the current study contribute to this emerging evidence.

The current study found a positive relationship between health competence and QoL for all community emerging adults. Health competence was shown to be particularly influential for emerging adults with chronic health conditions. In children, adolescents, and adults with chronic health conditions, there is a well-established relationship between higher QoL and healthier coping skills, better prognosis of one's condition, and more satisfaction with life (e.g., CDC, 2000; Megari, 2013), which highlight the importance of interventions focused on promoting the QoL of individuals with chronic health conditions. The findings of the current study suggest that interventions aimed to improve emerging adults' level of health competence may be beneficial in promoting higher QoL, regardless of chronic health condition status and current living situation. This study identified some factors that may influence how much an individual's QoL would improve with higher PHC, but overall found that all emerging adults have the potential to demonstrate improvement in their QoL with increased health competence.

### **Potential Intervention to Promote Health Competence**

To the author's knowledge, no current program exists that is specifically focused on promoting individuals' health competence. However, there are existing interventions and recommendations that focus on improving general self-efficacy as it relates to one's healthcare (e.g., Coleman & Newton, 2005; Delfs, 2011; Hoffman, 2013) that may be applied to health competence. The goal of these interventions and recommendations is to promote the general self-efficacy of patients with chronic health conditions, in order to enhance their confidence and their ability to deal effectively with difficult or unexpected events related to their condition (Coleman & Newton, 2005; Cramm et al., 2013; Delfs, 2011; Hoffman, 2013). The primary

recommendation across these health-related self-efficacy interventions is to begin to promote health competence shortly after the initial diagnosis and to engage the child in the process of self-management early on. These recommendations encourage the support of both parents and healthcare providers.

*Role of Parents in Promoting the Child's PHC.* Based on the theory of individual and family self-management (Ryan & Sawin, 2009), parents could begin to promote their child's health competence early by initially implementing family self-management, which encourages parents to act as a partner to their child and share healthcare management responsibilities with their child (Kieckhefer et al., 2009). The goal of a gradual transition from family self-management to individual self-management is to develop a state of inter-dependence that promotes the child's competency regarding their own healthcare (Kieckhefer et al., 2009). Through purposeful incorporation of health-related behaviors into the daily routines of the child and his or her family, parents can help to create a bridge for their child to full independence and individual self-management (Ryan & Sawin, 2009). It is important for families to view self-management as an ongoing process of collaboration between children with chronic health conditions and their parents to achieve control of their children's condition, health, and overall well-being (Ryan & Sawin, 2009), which in turn promotes the child's health competence. By first implementing family self-management, then transitioning to individual self-management, parents may be able to encourage a gradual increase in their child's health competence, with the ultimate goal of developing the skills necessary for a successful transition into adulthood, independent self-management, and higher QoL (Sawin et al., 2009).

*Role of Healthcare Providers in Promoting their Child's PHC.* Healthcare providers may also play a key role in promoting emerging adults' health competence and overall QoL. Support

of patient self-management is a key component of effective care for chronic health conditions and improved patient outcomes (Coleman & Newton, 2005; Delfs, 2011; Hoffman, 2013). Self-management support by healthcare providers should focus on developing patient problem-solving skills, promoting overall self-efficacy, and supporting the application of these skills to real-life situations (Coleman & Newton, 2005). Healthcare providers can also adopt system-focused changes in the primary care setting, such as structured patient-physician interactions focused on promoting skills related to health competence, removing self-management barriers from the office environment, and making community self-management resources more readily available to emerging adults (Coleman & Newton, 2005; Delfs, 2011). The results from the current study supports the widespread implementation of practice strategies in the healthcare setting that promote patient self-management and improved patient outcomes among individuals with chronic health conditions (Coleman & Newton, 2005; Delfs, 2011; Hoffman, 2013). Unfortunately, over one-fourth of the emerging adults with one or more chronic health conditions in the current study reported that they were not currently under the care of a healthcare provider. Another important area for future interventions should focus on increasing emerging adults' usage of healthcare providers in the management of their condition, with the goal of promoting health competence, as well as QoL.

### **Limitations**

The current study provides important information regarding the relationship between PHC and QoL; however, it is not without limitations. The participants in the current study were all 18- to 25-years-old, which may not encompass the entire range of "emerging adulthood." Some researchers argue that emerging adulthood continues into the late 20's (e.g., Fry, 2017; Wood et al., 2018); however, Arnett (2000, 2004, 2018) opposes this viewpoint by arguing that

the years immediately following college (i.e., 26- to 29-years-old) are extremely diverse and constitute a developmental period distinct from “emerging adulthood.” Also, the majority of participants were Caucasian/White and well-educated (average of 14 years of education), which is not representative of the greater population of emerging adults. The lack of diversity in the participant demographics limits the ability to generalize findings to a more diverse population and the results should be interpreted with caution.

Another limitation of the current study was the nature of the online survey. Collecting data through an online survey limits the conclusions that can be made because it is possible for participants to provide false information, which cannot be verified. Specifically, participants were asked to self-report the presence or absence of chronic health conditions, whereas in many research studies, medical records are utilized to determine the presence of chronic health conditions. When using a self-report survey, there is also potential of participants responding in a socially desirable way, rather than honestly. However, to decrease the likelihood of a social desirability response bias and encouraging participants to provide accurate information, they were ensured the confidentiality of their responses prior to beginning the online survey.

Emerging adults’ living situations can be highly variable during the transitional period of emerging adulthood (e.g., Arnett, 2004, 2018; Goldscheider & Goldscheider, 1999; Rindfuss, 1991). Additionally, emerging adults’ choice in living situation is most likely dependent upon many internal, as well as external, factors, such as personality, social skills, education level, vocation, marital/relationship status, and cultural influences (Arnett, 2018). Within the current sample, there were significant demographic differences between the two living situations examined based on age, race/ethnicity, education, student status, as well as marital status. The significant demographic differences based on current living situation in the current sample, along

with previous research (e.g., Arnett, 2018), suggest that emerging adults' living situations are not random and potentially the factors influencing emerging adults' living situations are more important for future research, than current living situation.

The lack of an operationalized definition of "parental support" is an additional limitation to the current study. There was significantly less parental support endorsed for the two semesters in which participants were required to qualitatively describe the parental support received in managing their conditions, in comparison to the two semesters in which participants had to indicate the forms of parental support received on a checklist. This indicates that individual interpretations of what constitutes "parental support" may vary. Potentially, some of the items included on the checklist of forms of parental support may not be interpreted as parental support by all emerging adults. Thus, parental support may be too variable in its interpretations and may not be the best indicator of emerging adults who may require targeted interventions. Instead satisfaction with parental support received or control of chronic health condition symptoms may be more appropriate variables to consider when deciding who may benefit from targeted intervention.

### **Future Directions**

Emerging adulthood has clearly been established as a distinct developmental time period in time and the results of the current study add to that literature. Additionally, the findings suggest that future research is necessary to better understand the unique challenges and opportunities faced during emerging adulthood. The current study utilized a cross-sectional design, which only collected data from emerging adults at a single time-point. This limits the interpretation that can be made from the data, as only the current state of the emerging adults can be analyzed. In order to better understand the impact of PHC on QoL, future research should

utilize a longitudinal design, which would allow for causal relationships to be drawn.

Specifically, future research should follow individuals in their late adolescence through the end of emerging adulthood to further investigate any patterns that exist over this transitional period prior to adulthood.

For the current study, participants reported whether or not they had one or more chronic health conditions and the perceived control of their symptoms. The amount of impairment or interference on daily functioning was not examined, which limits our understanding of the impact of chronic health conditions during emerging adulthood. Despite the non-categorical approach to chronic health conditions taken in the current study (Stein & Jessop, 1982, 1989), information regarding severity or intensity of symptoms, level of impairment, and overall mental, physical, and social functioning may provide further insight into the potential differential impact that chronic health conditions have on the emerging adults' PHC and QoL. Other factors that may influence PHC and QoL for emerging adults with chronic health conditions and are important for future studies to investigate include cause of condition (i.e., genetic, injury-related, or unknown), medical demand of the condition, as well as the length of time since the initial diagnosis of a chronic health condition.

Health competence is a form of self-efficacy that is specifically related to one's perceived ability to manage their own health outcomes (Smith et al., 1995). Self-efficacy is defined as an individual's perception of their own abilities (Bandura, 1997), and has been shown to be influenced by many different factors, including motivation, personality, self-esteem, and skill level (Gist & Mitchell, 1992). Although the current study demonstrated a consistent positive association between PHC and QoL, it is possible that this relationship is driven by outside factors that are influencing one's health competence, which then in turn influencing their QoL. Future

research should investigate these potential auxiliary factors related to health competence that may be more important predictors of QoL than PHC itself.

Additionally, future research should utilize more advanced statistical modeling to further examine the relationship between PHC and QoL. More advanced statistical analyses could incorporate multiple potential factors influencing PHC and QoL for emerging adults with chronic health conditions, such as demographic factors, frequency, intensity, and severity of chronic health condition symptoms, condition-related disability, and ability to successfully treat the condition. A path analysis would allow for the identification of the relative impact of each variable on one another and on PHC and QoL. Using a path analysis, potential risk factors for lower PHC and/or QoL could be determined. Additionally, potential protective factors that may foster resiliency in emerging adults with chronic health conditions and promote higher QoL may be uncovered.

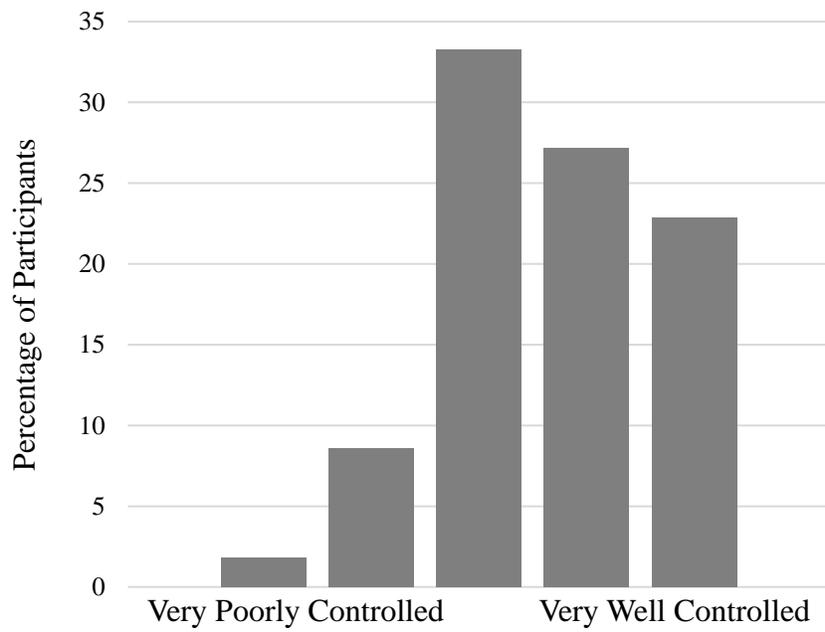
Although this study points to a clear area for intervention, it does not investigate whether interventions aimed to enhance PHC will result in higher QoL. Future research should focus on the development of interventions aimed to enhance general self-efficacy as it relates to one's healthcare to determine the effectiveness of these interventions in improving QoL. Since the current study demonstrated a positive association between PHC and QoL for emerging adults with and without chronic health conditions, a starting point could be to implement these trial interventions in a sample of emerging adults without chronic health conditions, before implementing such interventions in a sample of emerging adults with chronic health conditions.

## **Conclusions**

Many emerging adults with chronic health conditions are required to assume greater responsibility regarding their self-care as they transition into adulthood and seek more

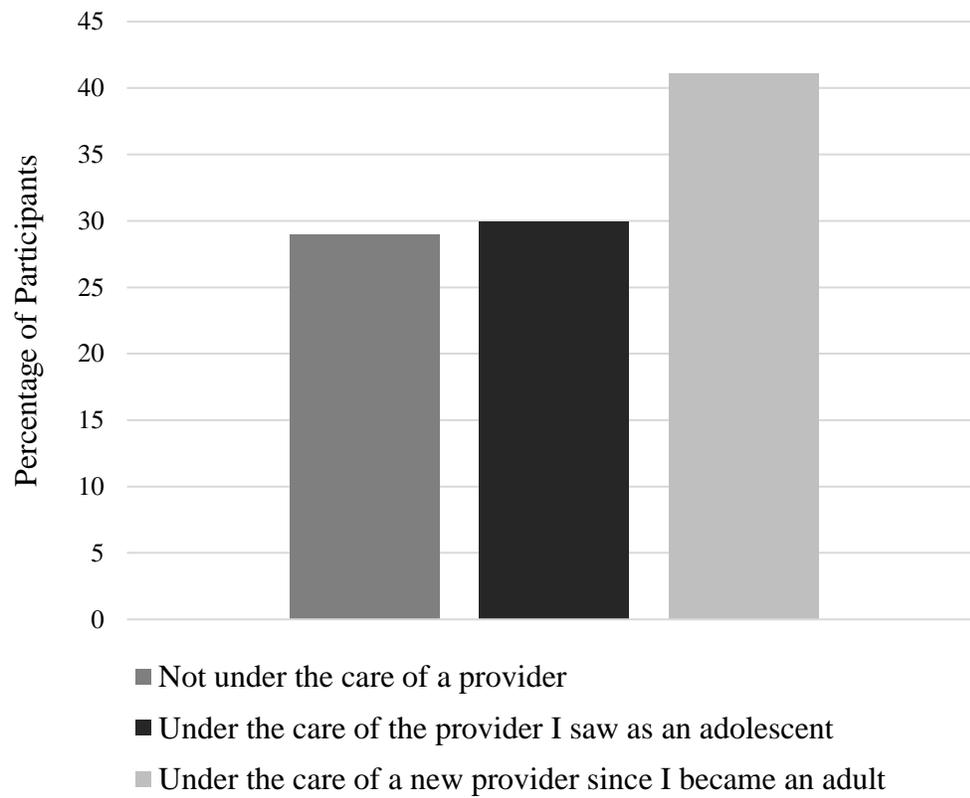
independence from their parents (Dovey-Pearce & Christie, 2013; Heath et al., 2017). However, the greater assumed responsibility may be associated with increased stress, which is known to exacerbate the symptoms and worsen the prognosis of chronic health conditions (Compas et al., 2012). The results of the current study, along with emerging evidence in the literature (Bachmann et al., 2016; Cramm et al., 2013; van Empelen et al., 2005), demonstrated a positive association between health competence and quality of life. Although the current study identified some factors that may differentially impact this positive association, the results suggest that promotion of emerging adults' health competence may play a key role in improving their quality of life during this transitional period, regardless of chronic health condition status and current living situation. Currently, no specific intervention aimed to promote health competence exists; however, there are interventions broadly focused on promoting health-related self-efficacy, which encourage the involvement of both parents and healthcare providers (e.g., Coleman & Newton, 2005; Delfs, 2011; Hoffman, 2013). Future research should focus on the development of targeted interventions for emerging adults with chronic health conditions to promote health competence to increase independent self-management, enhance coping skills, help with adjustments to living with chronic health conditions in adulthood, and improve overall quality of life.

Figure 1. Perceived control of chronic health condition symptoms



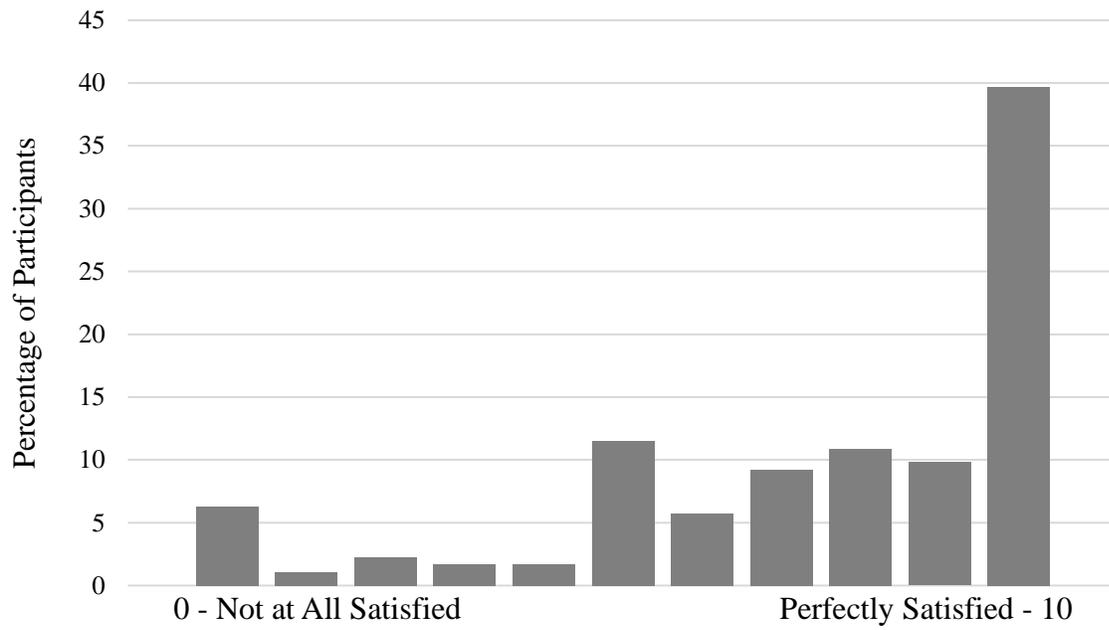
Note:  $n=307$ .

Figure 2. Provider care for chronic health conditions



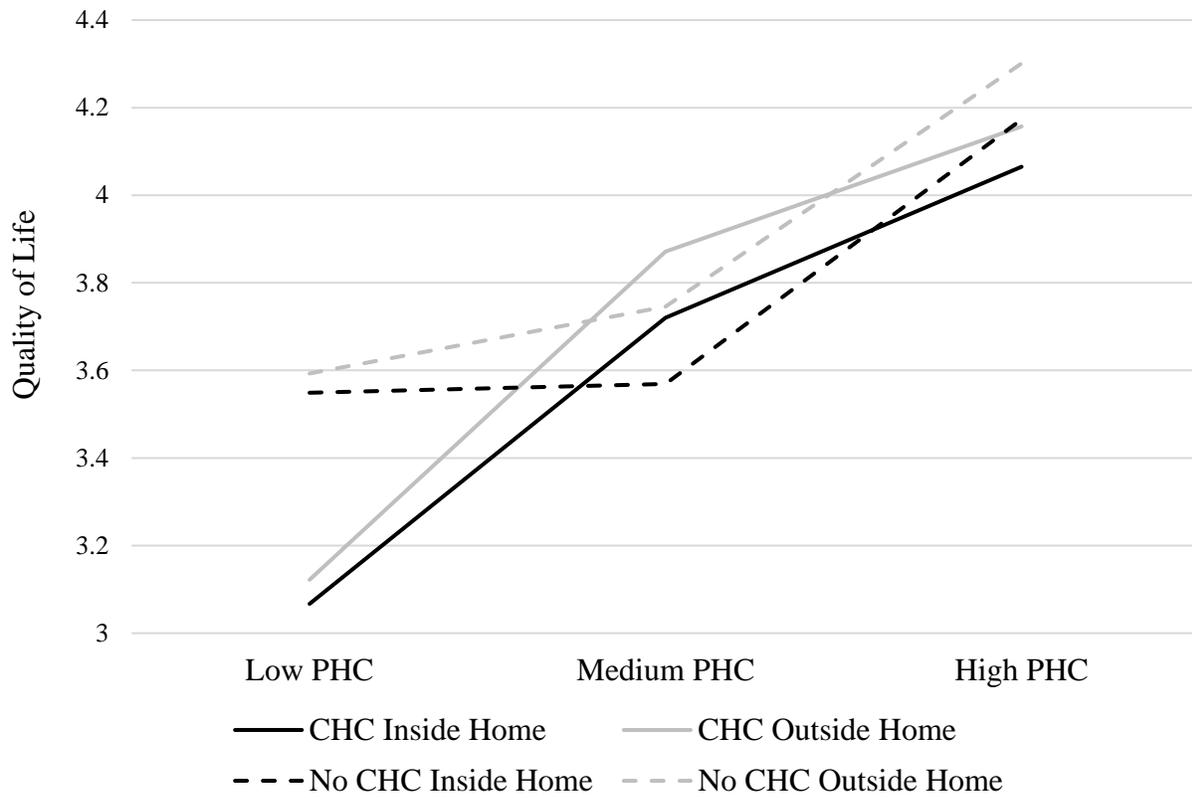
Note:  $n=297$ .

Figure 3. Satisfaction with parental support received in managing symptoms of chronic health conditions



Note:  $n=174$ .

Figure 4. Two-way interaction between perceived health competence and chronic health condition status on emerging adults' quality of life



Note: see Table 5 for subgroup means and standard deviations.

Table 1. Participant demographic information

<b>Variable</b>	<b>Total (N=929)</b>	<b>1+ CHCs (n=328)</b>	<b>No CHC (n=601)</b>
<b>Age</b>	<i>M</i> =22.19 ( <i>SD</i> =1.95)	<i>M</i> =22.31 ( <i>SD</i> =1.96)	<i>M</i> =22.12 ( <i>SD</i> =1.95)
<b>Gender</b>			
Female	55%	67%	49%
Male	45%	33%	51%
<b>Race/Ethnicity</b>			
Caucasian/White	73%	73%	74%
African-American/Black	9%	9%	10%
Latino/a	5%	5%	6%
Mixed	5%	8%	3%
Asian (including South Asian and Southeast Asian)	5%	2%	6%
Other	2%	3%	1%
<b>Marital Status</b>			
Single, never married	93%	90%	95%
Married	5%	7%	5%
Divorced	1%	2%	<1%
Separated	<1%	<1%	<1%
<b>Education Level</b>			
13-15 years – Some College	54%	54%	53%
16 years – College Degree	23%	21%	24%
12 years – High School Graduate	12%	10%	12%
More than 16 years	8%	9%	8%
Less than 12 years	3%	5%	3%
Average (in years)	<i>M</i> =14.41 ( <i>SD</i> =1.99)	<i>M</i> =14.34 ( <i>SD</i> =2.18)	<i>M</i> =14.44 ( <i>SD</i> =1.88)
<b>Student Status</b>			
Full-time college student	51%	52%	50%
Non-student	40%	38%	41%
Part-time college student	8%	9%	7%
High school student	1%	1%	2%
<b>Current Living Situation</b>			
Outside Family Home	72%	74%	70%
<i>Live with roommate(s)</i>	37%	34%	39%
<i>Live with spouse/romantic     partner</i>	17%	22%	14%
<i>Live alone</i>	13%	13%	12%
<i>Live with another family     member (not parent)</i>	4%	4%	4%
<i>Other</i>	1%	1%	1%
Inside Family Home	28%	26%	29%
<i>Live with both parents</i>	19%	15%	21%
<i>Live with one parent</i>	9%	11%	8%

Note: Some percentages may not sum to 100 due to rounding error and intermittent missing responses.

Table 2. Prevalence of specific chronic health conditions for emerging adults who reported having one or more chronic health conditions

<b>Variable</b>	<b><i>n</i></b>	<b>Percentage</b>
<b>Chronic Health Condition Status</b>		
One Chronic Health Condition	212	65%
Two or More Chronic Health Conditions	116	35%
<b>Chronic Health Condition Type</b>		
Asthma	106	32%
Anxiety	90	27%
Depression	68	21%
Food allergy	41	12%
Attention-deficit/hyperactivity disorder (ADHD)	35	11%
Obesity	28	9%
Chronic headache/migraine	22	7%
Recurrent abdominal pain/irritable bowel syndrome	22	7%
Inflammatory bowel disease (Crohn's/colitis)	11	3%
Arthritis/rheumatological condition	9	3%
Heart disease	9	3%
Eating disorder	8	2%
Epilepsy/seizure disorder	6	2%
Diabetes (type 1)	4	1%
Diabetes (type 2)	4	1%
Cancer/cancer survivor	3	1%
Celiac disease	3	1%
Sickle cell disease/blood disorder	1	<1%
Other	42	13%

Note: Total number of emerging adults in sample with one or more chronic health conditions was 328. Also, percentages for chronic health condition type do not sum to 100 because participants were allowed to select all that applied.

Table 3. Forms of parental support received by emerging adults in managing their chronic health conditions

<b>Variable</b>	<b><i>n</i></b>	<b>Percentage</b>
<b>Any</b>	<b>139</b>	<b>75%</b>
<b>Financial</b>	<b>120</b>	<b>65%</b>
Insurance	113	61%
Medication Pay	74	40%
Appointment Pay	70	38%
Food Money	57	31%
Gas Money	36	19%
<b>Emotional</b>	<b>111</b>	<b>60%</b>
General Emotional Support	110	59%
Advice	71	38%
<b>Instrumental</b>	<b>79</b>	<b>42%</b>
Food Preparation	56	30%
Pick Up Medications	49	26%
Chores	41	22%
Scheduling	39	21%
Ride to Appointments	34	18%
<b>None</b>	<b>48</b>	<b>26%</b>
<b>Other</b>	<b>3</b>	<b>2%</b>

Note: Total number of participants who reported having one or more chronic health conditions and reported whether or not they received parental support was 186. Also, percentages do not sum to 100 because participants were allowed to select all that applied.

Table 4. Hierarchical multiple regression analysis of the ability of perceived health competence, chronic health conditions status, and current living situation to predict quality of life, after controlling for gender

	$\Delta R^2$	<i>F</i> Change	<i>df</i>	<i>B</i> ( <i>SE</i> ) <sup>†</sup>	<i>t</i> -value
<b>Step 1</b>	<b>.001</b>	<b>1.33</b>	<b>1,927</b>		
<b>Gender</b>				.07(.06)	1.16
<b>Step 2</b>	<b>.237</b>	<b>95.69***</b>	<b>3,924</b>		
<b>Gender</b>				-.02(.05)	-.36
<b>PHC</b>				.08(.01)	16.10***
<b>CHC Status</b>				-.21(.05)	-2.23*
<b>Living Situation</b>				.09(.06)	1.66
<b>Step 3</b>	<b>.005</b>	<b>1.84</b>	<b>3,921</b>		
<b>Gender</b>				-.02(.05)	-.29
<b>PHC</b>				.07(.01)	7.07***
<b>CHC Status</b>				-.09(.10)	-.86
<b>Living Situation</b>				.11(.07)	1.53
<b>PHC*CHC Status</b>				.02(.01)	2.32*
<b>PHC*Living Situation</b>				<.01(.01)	.08
<b>CHC Status*Living Situation</b>				-.03(.12)	-.22
<b>Step 4</b>	<b>&lt;.001</b>	<b>&lt;.01</b>	<b>1,920</b>		
<b>Gender</b>				-.02(.05)	-.29
<b>PHC</b>				.07(.01)	6.17***
<b>CHC Status</b>				-.09(.10)	-.86
<b>Living Situation</b>				.11(.07)	1.53
<b>PHC*CHC Status</b>				.02(.02)	1.14
<b>PHC*Living Situation</b>				<.01(.01)	.03
<b>CHC Status*Living Situation</b>				-.03(.12)	-.22
<b>PHC*CHC Status*Living Situation</b>				<.01(.02)	.07

Note: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>†</sup>*B*(*SE*)=unstandardized coefficients(standard error).

Table 5. Ability of perceived health competence and living situation to predict quality of life for the subgroup of emerging adults without a chronic health condition and the subgroup of emerging adults with a chronic health condition, after controlling for gender

	$\Delta R^2$	<i>F</i> Change	<i>df</i>	<i>B</i> ( <i>SE</i> ) <sup>†</sup>	<i>t</i> -value
<b>Post-hoc Analyses for Emerging Adults without a Chronic Health Condition</b>					
<b>Step 1</b>	<b>.002</b>	<b>1.44</b>	<b>1,599</b>		
Gender				.08(.07)	1.20
<b>Step 2</b>	<b>.187</b>	<b>68.94***</b>	<b>2,597</b>		
Gender				.04(.06)	.60
PHC				.07(.01)	11.60***
Living Situation				.11(.07)	1.65
<b>Step 3</b>	<b>&lt;.001</b>	<b>&lt;.01</b>	<b>1,596</b>		
Gender				.04(.06)	.60
PHC				.07(.01)	6.38***
Living Situation				.11(.07)	1.63
PHC*Living Situation				<.01(.01)	<.01
<b>Post-hoc Analyses for Emerging Adults with One or More Chronic Health Conditions</b>					
<b>Step 1</b>	<b>.002</b>	<b>.79</b>	<b>1,326</b>		
Gender				-.10(.11)	-.89
<b>Step 2</b>	<b>.276</b>	<b>61.89***</b>	<b>2,324</b>		
Gender				-.12(.10)	-1.27
PHC				.09(.01)	11.13***
Living Situation				.07(.10)	.73
<b>Step 3</b>	<b>&lt;.001</b>	<b>&lt;.01</b>	<b>1,323</b>		
Gender				-.12(.10)	-1.26
PHC				.09(.02)	5.45***
Living Situation				.08(.11)	.73
PHC*Living Situation				<.01(.02)	.09

Note: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>†</sup>*B*(*SE*)=unstandardized coefficients(standard error).

Table 6. Mean quality of life scores for subgroups of participants based on three categories of perceived health competence (low, medium, and high)

<b>Subgroup of Participants</b>	<b>Low PHC</b>	<b>Medium PHC</b>	<b>High PHC</b>
No CHC, Outside Home	3.59( <i>SD</i> =.850)	3.75( <i>SD</i> =.692)	4.30( <i>SD</i> =.648)
No CHC, Inside Home	3.55( <i>SD</i> =.879)	3.57( <i>SD</i> =.900)	4.17( <i>SD</i> =.760)
1+ CHCs, Outside Home	3.12( <i>SD</i> =.959)	3.87( <i>SD</i> =.760)	4.16( <i>SD</i> =.773)
1+ CHCs, Inside Home	3.07( <i>SD</i> =.980)	3.72( <i>SD</i> =.737)	4.07( <i>SD</i> =.629)

Table 7. Impact of comorbidity of chronic health conditions on the relationship between perceived health competence and quality of life

	$\Delta R^2$	<i>F</i> Change	<i>df</i>	<i>B</i> ( <i>SE</i> ) <sup>†</sup>	<i>t</i> -value
<b>Step 1</b>	<b>.275</b>	<b>61.66***</b>	<b>2,325</b>		
<b>PHC</b>				.09(.01)	11.08***
<b>Comorbidity</b>				.09(.10)	.89
<b>Step 2</b>	<b>.003</b>	<b>1.51</b>	<b>1,324</b>		
<b>PHC</b>				.08(.01)	8.38***
<b>Comorbidity</b>				.10(.10)	1.01
<b>PHC*Comorbidity</b>				.08(.02)	1.23

Note: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>†</sup>*B*(*SE*)=unstandardized coefficients(standard error).

Table 8. Impact of perceived control of chronic health condition symptoms on the relationship between perceived health competence and quality of life

	$\Delta R^2$	<i>F</i> Change	<i>df</i>	<i>B</i> ( <i>SE</i> ) <sup>†</sup>	<i>t</i> -value
<b>Step 1</b>	<b>.280</b>	<b>59.13***</b>	<b>2,304</b>		
<b>PHC</b>				.08(.01)	8.65***
<b>Perceived Control of Symptoms</b>				.31(.10)	3.12**
<b>Step 2</b>	<b>.003</b>	<b>1.06</b>	<b>1,303</b>		
<b>PHC</b>				.09(.01)	7.13***
<b>Perceived Control of Symptoms</b>				.30(.10)	3.09**
<b>PHC*Perceived Control of Symptoms</b>				-.02(.02)	-1.03

Note: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>†</sup>*B*(*SE*)=unstandardized coefficients(standard error).

Table 9. Impact of parental support received in managing chronic health conditions on the relationship between perceived health competence and quality of life

	$\Delta R^2$	<i>F</i> Change	<i>df</i>	<i>B</i> ( <i>SE</i> ) <sup>†</sup>	<i>t</i> -value
<b>Any Support Received</b>					
<b>Step 1</b>	<b>.246</b>	<b>29.79***</b>	<b>2,183</b>		
PHC				.09(.01)	7.47***
<b>Any Support Received</b>					
				-.23(.14)	-1.63
<b>Step 2</b>	<b>.005</b>	<b>1.13</b>	<b>1,182</b>		
PHC				.07(.02)	2.89**
<b>Any Support Received</b>					
				-.25(.14)	-1.70
<b>PHC*Any Support</b>					
				.03(.03)	1.06
<b>Emotional Support Received</b>					
<b>Step 1</b>	<b>.235</b>	<b>28.06***</b>	<b>2,183</b>		
PHC				.08(.01)	7.49***
<b>Emotional Support Received</b>					
				-.01(.13)	-.11
<b>Step 2</b>	<b>.001</b>	<b>.22</b>	<b>1,182</b>		
PHC				.08(.02)	4.31***
<b>Emotional Support Received</b>					
				-.02(.13)	-.12
<b>PHC*Emotional Support</b>					
				.01(.02)	.47
<b>Financial Support Received</b>					
<b>Step 1</b>	<b>.241</b>	<b>29.10***</b>	<b>2,183</b>		
PHC				.09(.01)	7.48***
<b>Financial Support Received</b>					
				-.17(.13)	-1.26
<b>Step 2</b>	<b>.003</b>	<b>.66</b>	<b>1,182</b>		
PHC				.07(.02)	3.64***
<b>Financial Support Received</b>					
				-.17(.13)	-1.31
<b>PHC*Financial Support</b>					
				.02(.03)	.81
<b>Instrumental Support Received</b>					
<b>Step 1</b>	<b>.235</b>	<b>28.15***</b>	<b>2,183</b>		
PHC				.09(.01)	7.50***
<b>Instrumental Support Received</b>					
				.05(.13)	.37
<b>Step 2</b>	<b>.010</b>	<b>2.37</b>	<b>1,182</b>		
PHC				.07(.02)	4.44***
<b>Instrumental Support Received</b>					
				.04(.13)	.33
<b>PHC*Instrumental Support</b>					
				.04(.02)	1.54

Note: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>†</sup>*B*(*SE*)=unstandardized coefficients(standard error).

Table 10. Impact of presence of any form of parental support received in managing chronic health conditions and satisfaction with parental support received on the relationship between perceived health competence and quality of life

	$\Delta R^2$	<i>F</i> Change	<i>df</i>	<i>B</i> ( <i>SE</i> ) <sup>†</sup>	<i>t</i> -value
<b>Step 1</b>	<b>.270</b>	<b>20.99***</b>	<b>3,170</b>		
<b>PHC</b>				.08(.01)	6.28***
<b>Any Support Received</b>				-.24(.15)	-1.55
<b>Satisfaction with Parental Support Received</b>				.05(.02)	2.40*
<b>Step 2</b>	<b>.004</b>	<b>.32</b>	<b>3,167</b>		
<b>PHC</b>				.06(.03)	2.33*
<b>Any Support Received</b>				-.24(.15)	-1.59
<b>Satisfaction with Parental Support Received</b>				.05(.04)	1.32
<b>PHC*Any Support</b>				.02(.03)	.82
<b>PHC*Satisfaction</b>				<-.01(.01)	-.46
<b>Any Support*Satisfaction</b>				<.01(.05)	.11
<b>Step 3</b>	<b>.007</b>	<b>1.71</b>	<b>1,166</b>		
<b>PHC</b>				.06(.03)	2.51*
<b>Any Support Received</b>				-.19(.16)	-1.19
<b>Satisfaction with Parental Support Received</b>				.05(.04)	1.33
<b>PHC*Any Support</b>				.02(.03)	.68
<b>PHC*Satisfaction</b>				<.01(.01)	.67
<b>Any Support*Satisfaction</b>				<-.01(.05)	-.08
<b>PHC*Any Support*Satisfaction</b>				-.01(.01)	-1.31

Note: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>†</sup>*B*(*SE*)=unstandardized coefficients(standard error).

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