

Describing Working Alliance Longitudinally in a Peer Support Intervention for
Adolescents and Young Adults with Chronic Illness
by

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Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
of Philosophy in the Department of
Psychology and Neuroscience in the Graduate School
of Duke University

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ABSTRACT

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Abstract

Peer support is one theoretically grounded and developmentally informed approach to support the unique psychosocial challenges faced by adolescents and young adults (AYAs) living with childhood onset chronic conditions (COCCs). Working alliance is presented as one well-established construct to understand the underlying mechanisms of peer support in this population. This exploratory study sought to describe the working alliance trajectory in a peer support intervention for AYAs with a COCC.

The present study was a substudy of a randomized controlled trial examining the efficacy of a one-to-one telephone-based peer coaching intervention for AYAs with a COCC designed to promote self-management and patient activation. The present study aimed to describe the working alliance trajectory from the perspective of the AYA over the first four coaching sessions and to examine AYA, peer coach, and dyadic characteristics (gender, age, race, COCC category) that influence the working alliance trajectory. This study also utilized qualitative analyses to describe core aspects of the AYA-peer coach relationship over time. AYAs completed a self-report measure to assess their perceived working alliance following the first four peer coaching sessions. For 32 AYA-peer coach dyads, linear random coefficient regression models for longitudinal

data were conducted to describe the trajectory of overall working alliance across the first four coaching sessions.

AYAs perceived a strong working alliance in the first peer coaching session, which was maintained across three subsequent sessions. There were no significant differences in working alliance trajectory across AYA, peer coach, and dyadic characteristics. Although not significantly significant, a trend emerged in which AYAs and peer coaches with the same COCC had a decrease in working alliance over time, while AYAs and peer coaches with a different COCC had an increase in working alliance over time. Qualitative findings revealed themes describing peer coach skills consistent with the working alliance construct (warmth, empathy, genuineness; alignment with AYA's goals) as well as the ability to integrate similar experiences to build a trusting relationship and provide support, which may be unique to the peer relationship.

Findings from the present study serve as a foundation for future efforts to capture the underlying mechanisms of peer support for AYAs with a COCC, which can inform the design of research and clinical programming that effectively leverage peer support to promote outcomes.

Dedication

This work is dedicated to my fellow peer supporters in the Sunrise, ATLAS, and PiCASO communities who have continued to re-affirm the power of one peer who truly “gets it.”

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1. Introduction

Over the past four decades, the prevalence of youth living with a childhood onset chronic condition (COCC) has steadily increased (Perrin et al., 2007). Increasing prevalence is attributed to increases in both life expectancy and disease incidence. Due to recent medical advances over the past few decades, the life expectancy for individuals living with a COCC has improved dramatically (Perrin et al., 2007). For example, among youth diagnosed with cancer, the mean survival rate has increased from 58% in the mid-1970s to approximately 83% today (Howlander et al., 2020). Sickle cell disease and cystic fibrosis were once considered fatal during childhood, and today, youth living with these COCCs are expected to live into their fifth decade, respectively (Cystic Fibrosis Foundation, 2020; Lubeck et al., 2019). An increase in survival rates in COCCs is coupled with an increase in incidence rates of many COCCs. Between 2002 and 2015, for example, the incidence of type 1 and type 2 diabetes among youth increased 1.9% and 4.8% per year, respectively (Divers, 2020). Since the early 1970s, there has been an approximate 30% increase in cancer incidence among adolescents and young adults in the United States (Scott et al., 2020). While precise prevalence estimates vary due to the lack of a universal definition of a COCC (van der Lee et al., 2007), approximately 15% of youth in the United States live with one or more COCCs (Van Cleave et al., 2010).

For adolescents and young adults (AYAs), the introduction of a COCC presents distinct psychosocial disruptions as AYAs must simultaneously cope with stressors that accompany the COCC while also navigating core developmental milestones. Peer support is a promising approach to meet these challenges experienced by AYAs with a COCC. Both robust theoretical underpinnings (Bandura, 1986; Festinger, 1954), as well as initial empirical evidence of the effectiveness of peer support interventions (Kohut et al., 2014) support the use of peer support for AYAs with a COCC. The present study sought to understand the underlying mechanisms of a peer-based intervention for AYAs with a COCC. The present chapter, (1) reviews normative AYA development in parallel with the disruptions experienced by AYAs with a COCC; (2) introduces peer support and theories underlying peer support and; (3) presents working alliance as a well-established construct to better understand the underlying mechanisms of a peer support intervention for AYAs with a COCC.

1.1 AYA Development and the Chronic Illness Disruption

Diagnosis, treatment, and management of a COCC during the AYA period can present significant disruption to normative AYA development. The following section reviews normative AYA development alongside the specific challenges posed by a COCC diagnosis, treatment, and long-term management.

1.1.1 Normative AYA Development

Adolescence is marked by significant physical, social, cognitive, and psychological change. Physically, young people experience immense biological and hormonal changes associated with puberty, including the development of secondary sex characteristics and a sharp increase in height and weight (Archibald et al., 2006; Huebner, 2009). Adolescents are also developing greater abstract reasoning (Piaget, 1929), defined by the ability to understand nonconcrete concepts (e.g., beliefs, hypothetical scenarios), and meta-cognitive thinking (e.g., thinking about oneself in relation to how others perceive them (Huebner, 2009). This time period is also characterized by rapid brain development, in which brain regions associated with emotion and reaction develop at a faster rate compared to brain regions associated with reasoning. This often leads to greater impulsive behavior as adolescents tend to act before thinking (Blakemore & Choudhury, 2006). Concurrently, adolescents typically experience large social changes, as youth in Western societies are transitioning to middle school or high school. Peers in school become increasingly relevant as adolescents develop romantic interests, become more interested in social status, and spend increasingly more time with peers – often with less adult supervision (Brown, 2013; Brown & Larson, 2009). Developmentally, adolescence is characterized by individuation and identity formation (Erikson, 1959). As adolescents begin to individuate from their

parents, they begin to gain greater independence and are given more responsibilities (Erikson, 1959). Moreover, adolescents begin to explore their identity, sense of self, and engage in increased experimentation with novel behaviors.

Emerging adulthood recently has been theorized as a distinct developmental period between adolescence and young adulthood for individuals in industrialized societies (Arnett, 2000, 2012, 2015). As a result of modernization and growth of higher education, youth in Western societies are often not expected to take on increasing responsibility until later in life, which has led to a new developmental phase. Similar to adolescence, emerging adulthood is also characterized by exploration and instability. Following high school, there are many transitions with regard to living arrangements, educational/vocational shifts, and level of independence. Building upon adolescence, further identity formation occurs, in which emerging adults are tasked with exploring and forming identities related to love/intimacy, work, and worldviews. For example, during this time, emerging adults become more intimate with greater rates of serious dating and further explore what they want in a romantic partner. Further, they begin to consider what career to pursue as they apply for full-time positions or professional schooling. Lastly, building upon adolescence, in emerging adulthood individuals are afforded greater independence with the opportunity to move outside the home and be exposed to different lifestyles and viewpoints. During this period there are fewer

commitments, and as such, it provides a unique opportunity to explore and experiment (Arnett, 2000, 2012, 2015).

1.1.2 The Chronic Illness Disruption

The introduction of a COCC can present disruption for normative developmental processes (Gurney et al., 2009; Piquart, 2014; Stam et al., 2005). AYAs with a COCC must simultaneously cope with myriad illness-related stressors alongside navigating developmental tasks.

1.1.2.1 Physical Functioning

In conjunction with physical changes that occur during normative adolescent development, AYAs with a COCC may experience distinct physical changes and pubertal differences compared with their peers. AYAs with a COCC may bear physical evidence of their condition, including pain, fatigue, and weight changes. For example, AYAs with diabetes may experience challenges related to condition-associated hormonal imbalances and AYAs with Crohn's disease and cystic fibrosis may exhibit delays in growth and puberty onset (Gasparetto & Guariso, 2014; Le et al., 2019). AYAs with cancer undergoing treatment may experience hair loss, weight changes, scars, and amputations. As AYAs have a greater focus on their appearance (Mission Australia Youth Survey, 2014), AYAs with a COCC report greater concern and dissatisfaction with their bodies compared with healthy peers (Fan & Eiser, 2009; Piquart, 2013b). AYAs

with a COCC also report negative impacts on psychosexual development (Stam et al., 2006), and delays in achieving sexual intimacy with a partner (Maurice-Stam et al., 2019; Stam et al., 2006).

1.1.2.2 Social Functioning

As adolescents transition to middle school and high school and spend greater time with peers, AYAs with a COCC may experience fewer opportunities for peer socialization due to hospitalizations, physical limitations, feeling ill, and being immunocompromised. AYAs with a COCC have higher rates of school absenteeism (Houtrow et al., 2012; Suris et al., 2004) and lower rates of school and community-based activity participation (Noonan et al., 2020). For example, adolescent survivors of cancer reported participation in less than half as many social activities following treatment completion compared with healthy peers (Pendley et al., 1997).

During a time in which social groups become more selective, AYAs living with a COCC report significantly worse social functioning and social competence compared with healthy peers (Martinez et al., 2011; Piquart & Teubert, 2012). Studies suggest that youth with diabetes are at greater risk for reduced social acceptance (Helgeson et al., 2007) and bullying (Piquart, 2017; Pittet et al., 2010), which could be attributed to physical differences, decreased social functioning, and biases towards youth with disabilities (Piquart, 2017). AYAs report difficulty with disclosing challenges associated

with their COCC and fear of peer rejection and being viewed as different (Kaushansky et al., 2017). Despite evidence pointing to social functioning deficits among AYAs with a COCC, other literature describes the ability for AYAs to develop strong social functioning skills and some studies indicate that AYAs are able to develop social skills similar to that of healthy peers (Lennon et al., 2016; Willard et al., 2020). Studies suggest that differences in social functioning may be shaped by the visibility of the COCC and its effect on neurocognitive functioning (Martinez et al., 2011).

1.1.2.3 Cognitive Functioning

Finally, during a time characterized by rapid brain development, some AYAs with a COCC are at risk for neurocognitive deficits. Many diseases affect the central nervous system, thereby potentially disrupting the expected rate of gains in reasoning skills. For example, youth with sickle cell disease have lower neurocognitive functioning compared with healthy peers (Schatz et al., 2002) and functioning declines within the first three years of life (Thompson et al., 2002). In addition to disease, treatments for COCCs can impact the central nervous system thereby disrupting the expected rate of gains in functioning. For example, childhood cancer patients receiving chemotherapy or cranial radiation therapies are at greater risk for developing various neurocognitive or learning challenges (e.g., deficits in executive functioning) (Cheung & Krull, 2015; Doger de Spéville et al., 2021; Iyer et al., 2015). While the disease and/or the treatment may

impact neurocognitive functioning, changes in brain functioning may also influence how AYAs cope with a COCC. During a time characterized by rapid brain development (Blakemore & Choudhury, 2006) and increased abstract reasoning skills (Piaget, 1979), AYAs with a COCC must also cope with a more nuanced understanding of the chronicity of their COCC as well as possibly confronting their own mortality (Quittner et al., 2009).

1.1.2.4 Psychological Functioning

During a time in which AYAs are tasked with navigating core developmental milestones, they must also cope with a range of stressors that accompany illness diagnosis, treatment, and long-term management. AYAs are tasked with adjusting to the numerous stressors during the initial diagnosis phase (Warner & Hauser, 2009), such as understanding the diagnosis, managing new treatment regimens, and confronting physical limitations. Following initial adjustment, living with a COCC often involves adhering to an ongoing medical regimen (e.g., taking medication or injecting insulin at regular intervals) and self-monitoring (e.g., tracking serum blood glucose levels) (Warner & Hauser, 2009). There is increased risk for psychopathology during this developmental period regardless of a COCC diagnosis (Costello et al., 2011). Compared with healthy peers, AYAs with a COCC are at increased risk for poor mental health outcomes, including depression, anxiety, and post-traumatic stress symptoms (Jones et

al., 2017; Pinqart, 2020; Pinqart & Shen, 2011a, 2011b). AYAs with a COCC have been found to have greater rates of loneliness (Maes et al., 2017) and lower self-esteem (Pinqart, 2013a). Up to 28% of AYAs recently diagnosed with cancer report significant levels of clinical distress (Kwak et al., 2013) and this population remains at two times greater risk for long-term emotional distress compared to healthy siblings (Zeltzer et al., 2009).

1.1.2.5 Developmental Milestones

There is a growing body of literature examining the developmental trajectory of AYAs with a COCC compared with healthy peers. Stam and colleagues (2005) found that young adults with a COCC achieved fewer developmental milestones compared with healthy counterparts. Moreover, AYAs with a COCC have lower rates of educational, vocational, and financial attainment, as well as lower rates of independent living, compared with healthy peers (Maslow et al., 2011; Pinqart, 2014). Regarding identity development, there is mixed evidence for the impact of a COCC. One study found adolescent cancer survivors were more likely to stagnate in the “foreclosed identity status” (Madan-Swain et al., 2000) suggesting that adolescent cancer survivors are more likely to select an identity status without actively exploring alternatives (Marcia, 1966). In contrast, other studies with AYA cancer survivors and AYAs with congenital heart disease found no differences in identity formation relative to healthy

peers (Luyckx et al., 2011; Prikken et al., 2021). However, among AYAs with congenital heart disease a “diffused identity status,” in which individuals have not explored or selected an identity (Marcia, 1966) was associated with worse psychological functioning, treatment adherence, and quality of life (Luyckx et al., 2011). Developing autonomy and identity development becomes increasingly more important as AYAs with a COCC are tasked with managing their condition.

1.1.2.6 Healthcare Transition

AYAs with a COCC begin to assume greater responsibility in managing their condition and transferring from pediatric to adult health care systems (Devine et al., 2017). This process, referred to as healthcare transition, is defined as the “purposeful, planned movement of adolescents and young adults with chronic physical and medical conditions from child-centered to adult-oriented health-care systems” (Blum et al., 1993, p. 570). Although studies suggest that an optimal healthcare transition is characterized by caregivers who remain involved and support the AYA in gradually assuming greater responsibility of their medical care (King et al., 2012), this process can often be complicated by the AYA’s developmental need to individuate and gain increasing responsibility from caregivers (Williams et al., 2002).

During this time, there is evidence that suggests that AYAs with a COCC remain insufficiently prepared to manage their care and effectively transfer to adult care

(McManus et al., 2013). AYAs with a COCC are at greater risk for treatment non-adherence (Pai & Ostendorf, 2011), decreased clinical attendance (Heery et al., 2015; Oeffinger et al., 2004; Sheehan et al., 2015; Yeung et al., 2008) and increased emergency department usage and hospitalization (Blinder et al., 2015; Nakhla et al., 2009). Not surprisingly, evidence suggests that AYAs with a COCC face greater risk for morbidity and mortality. For instance, one-third of AYAs with kidney transplants lose their grafts during this time period (Watson, 2000) and AYAs with sickle cell disease face greater risk of mortality (Hamideh & Alvarez, 2013; Quinn et al., 2010). This suggests that treatment adherence becomes fractured during this time period, with neither the parent nor the AYA assuming full responsibility. The importance of promoting an effective healthcare transition for AYAs with a COCC has reached national platforms, with a joint statement from the American Academy of Pediatrics, the American Academy of Family Physicians, and the American College of Physicians (American Academy of Pediatrics, et al., 2011) . Given difficulties engaging AYA patients in the healthcare system, it remains critical to find developmentally informed approaches to promote patient engagement.

1.2 Peer Support

1.2.1 History of Peer Support Interventions

The role of social support on health outcomes is well-established (Cohen, 2004; Cohen & Wills, 1985; Holt-Lunstad et al., 2010). Involving peers living with similar experiences or illnesses in the support of others has occurred informally for decades (Simoni et al., 2011). The growth of peer support interventions can be dated back to the mental health consumer movement in the 1970s (Davidson et al., 2012; Ostrow & Adams, 2012). With the deinstitutionalization of mental health care, other avenues for mental health care, including peer support interventions, gained traction to meet the demand. Following this shift, peer counseling became a more prevalent approach to providing care for individuals with mental health disorders. Over time, peer support expanded to other populations. (Ostrow & Adams, 2012).

The oldest form of peer support interventions is self-help groups (Solomon, 2004), defined as small gatherings of individuals with similar challenges and needs, in which attendees mutually support one another in pursuit of common goals (Katz & Bender, 1976). Many of the early self-help groups targeted individuals with mental health conditions, such as Alcoholics Anonymous and Schizophrenics Anonymous (Solomon, 2004). Over time, peer support interventions have diversified to train peers as agents of change in various modalities, such as counseling, mentoring, and education. In

previous decades, peer support has been leveraged as an approach to support individuals with chronic health conditions (Thompson et al., 2022), such as adult patients with diabetes (Dale et al., 2012; Gatlin et al., 2017) and cancer (Hoey et al., 2008; Meyer et al., 2015). There has also been growing evidence for the effectiveness of peer support in adults with chronic health conditions. For example, a recent meta-analysis found effectiveness for peer support interventions on improving glycemic control among patients with type 2 diabetes (Qi et al., 2015).

1.2.2 Theories Underlying Peer Support

Several core theories underly the role of peer support on health outcomes. Albert Bandura posited that human learning occurs within a social context, and not solely as a result of one's own behavioral consequences (Bandura, 1977). His work provided a theoretical basis for the influence that a social environment, including peers, can have on behavior. Two related theories, the social cognitive theory and social comparison theory, are discussed to help explain how peers learn from and influence one another. Both models rely on a perceived commonality among peers and posit that this commonality influences cognitive and behavioral change.

1.2.2.1 Social Cognitive Theory

An extension of Bandura's learning theory, social cognitive theory posits that individuals learn by observing others (Bandura, 1986). Specifically, individuals learn by

observing and encoding behaviors performed by others, which then influences subsequent behaviors (Bandura, 1986). One core tenant of social cognitive theory is social modelling (Bandura, 1986). Social modelling provides an opportunity to teach individuals how to navigate different circumstances. This was infamously tested in Bandura's classic Bobo doll experiment; children that watched an adult act aggressively towards a doll subsequently imitated the aggressive behavior towards the doll (Bandura, 1961). According to Bandura, social modelling can also promote self-efficacy, defined as one's belief that one can accomplish the task at hand (Bandura, 1982). In other words, observing another person perform a given task successfully can promote an individual's belief that they can accomplish the task.

The degree to which one identifies with the model influences the likelihood they are to follow the action being modelled (Bandura, 1986). Individuals are more likely to model others that they perceive as more similar to themselves. In the context of peer support, individuals with similar life experiences, such as an illness, may be better able to identify with one another. Individuals with similar illness experiences may therefore be more influential models. Consistent with the social cognitive theory, peer supporters with a similar illness experience have been found to instill hope and enhance future expectations through role modelling (Bellamy et al., 2017; Gidugu et al., 2015; Gillard et al., 2014; Sells et al., 2006; Solomon, 2004).

1.2.2.2 Self-Comparison Theory

Self-comparison theory postulates that individuals have an innate drive to evaluate themselves in relation to others, which in turn promotes a better understanding of self (Festinger, 1954). Individuals may seek to understand their current circumstances in relation to others in similar situations. According to this theory, people make judgments towards others that they perceive as better in a given area (upward comparisons) and judgments towards others they perceive as worse in a given area (downward comparisons), which influences self-regard and subsequent behavior (Wills, 1981; Wood, 1989).

Festinger argues that the tendency to self-compare with others changes as a function of one's perceived similarity with others (Festinger, 1954). Accordingly, individuals who perceive others as more similar are more likely to self-compare with them. Therefore, the likelihood for social comparisons among peers with a similar illness is greater than the likelihood for self-comparison with doctors or healthy peers (Barton & Henderson, 2016; Salzer, 2002).

Further research on social comparison theory has found that individuals base perceived similarities on commonalities related to a specific task, along with the experience level with the respective task (Goethals & Darley, 1987; Miller, 1982). In the healthcare context, patients may perceive fellow patients with the same illness who cope

with parallel stressors as more similar (Barton & Henderson, 2016; Salzer, 2002; Solomon, 2004). While coping with the unique challenges AYAs with a COCC face, AYAs living with a COCC may be more likely to self-compare with fellow AYAs with a COCC who experience similar stressors during this developmental period.

Despite robust theoretical underpinnings, there is not a universal definition of peer support in the healthcare literature (Simoni et al., 2011), a challenge stemming in part from varied definitions of what comprises a peer. One definition describes peer support as:

...the provision of emotional, appraisal and informational assistance by a created social network member who possesses experiential knowledge of a specific behaviour or stressor and similar characteristics as the target population (Dennis, 2003, p. 329).

Within this definition, it follows that an individual who shares a common experience with another person can provide assistance to that person. In the context of healthcare, one delineation of this common experience is that of a common illness (Dennis, 2003) as those with a common illness often face similar stressors (Dennis, 2003; Doull et al., 2005; Simoni et al., 2011; Solomon, 2004). Given the unique stressors faced by patients living with a COCC during adolescence and emerging adulthood, this paper defines a peer as an AYA with a COCC.

1.3 Peer Support for AYAs

1.3.1 Peer Support and AYA Normative Development

Developmental psychology literature highlights the salience of peer relationships during adolescence and emerging adulthood (Brown, 2013; Brown & Larson, 2009). During this time, individuals begin developing stronger relationships with peers who are similar in age. Relationships shift from playing together to forming closer, more complex relationships (Brown, 2013; Brown & Larson, 2009). It is during this time that youth begin to spend more time with peers and rely on them more for support (Brown, 2013; Brown & Larson, 2009). Research indicates that positive peer relationships are associated with better adjustment outcomes, including greater school involvement and less internalizing symptomatology (Crosnoe, 2000). Similarly, negative peer relationships are associated with poor outcomes, including social anxiety and depression (La Greca & Harrison, 2005).

1.3.2 Peer Support and AYAs with a COCC

For AYAs with a COCC, support from peers may be particularly critical. As described above, this population has unique physical, social, cognitive, psychological, and developmental challenges. Connecting with a peer provides an opportunity to develop healthy relationships, promote social skills, and build self-esteem (Evan & Zeltzer, 2006; Zelikovsky & Petrongolo, 2013). Developmentally, peer relationships and

peer acceptance play a critical role in autonomy and identity formation (Suris et al., 2004). From a psychological perspective, as AYAs with a COCC are coping with illness-related stressors, peers can provide a mechanism to share common concerns and challenges, as well as to model adaptive coping strategies (Roberts et al., 1997; Rosenberg et al., 2014). Among AYAs with a COCC, peer relationship quality is associated with treatment adherence (Helms et al., 2015; Pihlaskari et al., 2018) and psychological functioning (Helgeson et al., 2009). Among adolescents with cystic fibrosis, perceived peer support related to their COCC predicted greater treatment adherence over time (Helms et al., 2015).

AYAs with a COCC report that support from others similar in age and medical background is an essential element of care (D'Agostino et al., 2011). A multitude of studies have highlighted AYAs' interest in peer support in a range of patient populations, including cancer (Kent et al., 2013; Zebrack et al., 2006), type 1 diabetes (Boggiss et al., 2021; Lu et al., 2015), solid organ transplant (Anthony et al., 2021), asthma (Stewart et al., 2012), sickle cell disease (Kulandaivelu et al., 2018) and juvenile rheumatoid arthritis (Stinson et al., 2008). In the cancer literature, AYAs often report this being unmet (Kent et al., 2012; Rabin et al., 2011; Zebrack, 2008; Zebrack et al., 2013; Zebrack et al., 2006). In one study, 100% of AYA cancer survivors reported support from peers with cancer as a top five need during cancer treatment and 96% reported this need

after treatment (Zebrack et al., 2006). This study also found that patients reported support from other AYA cancer survivors as a more essential need than support from family and friends. Albeit speculative, Zebrack and colleagues (2006) argue this finding may be indicative of the unique role that peers with cancer can provide compared with healthy peers.

Given the salience of peer influence during the AYA period (Brown, 2013; Brown & Larson, 2009) and strong interest from patient populations (Rabin et al., 2011; Zebrack, 2008; Zebrack et al., 2006; Crosby et al., 2017; Lu et al., 2015; Kulandaivelu et al., 2018), peer support has been identified as a developmentally appropriate approach (D'Agostino et al., 2011; Zebrack & Isaacson, 2012). In recent years, there has been growing evidence related to the acceptability, feasibility, and effectiveness of peer support interventions for AYAs with COCC.

AYAs report high acceptability and feasibility of peer support interventions across modalities, including in-person support groups, one-on-one settings, and within technology-based interventions (Berkanish et al., 2022; Kohut et al., 2014). A systematic review examining the effects of peer support interventions for adolescents with a COCC found significant improvements on behavioral and emotional outcomes, including quality of life, adherence, and social connectedness (Kohut et al., 2014).

Despite the growing focus on peer support interventions for AYAs with a COCC, an understanding of the underlying components of peer support for this population are limited. In a recent systematic review, 25 unique peer-based interventions for AYA cancer survivors were identified in the literature; however, the peer relationship was not *directly* measured in any of the included studies (Brotkin et al., 2020). A better understanding of the underlying mechanisms in the peer-to-peer relationship is needed to inform efforts to design peer support interventions for AYAs with a COCC. One mechanism that seems particularly promising from psychotherapy literature is the concept of working alliance.

1.4 Working Alliance

Dating back to Anna Freud (1946), a long history of psychotherapy literature has identified the bond between therapist and patient as a consistent factor in predicting patient outcomes (Martin et al., 2000). The working alliance construct as defined by Bordin (1979) includes three components: the personal bond developed between the person providing and the person receiving support; the agreement upon treatment goals; and the agreement upon tasks during the session that aim to achieve the desired goals. Meta-analyses have shown a small to moderate effect of working alliance on treatment outcomes in child and adolescent psychotherapy across treatment modalities (Shirk et al., 2011; Shirk & Karver, 2003). While the construct originates in

psychotherapy literature, working alliance has also been conceptualized in the context of other helping relationships (Bordin, 1979), including the peer-to-peer relationship (Davidson et al., 2006; Davidson & Chan, 2014).

Consistent with the growing body of literature in peer support interventions for individuals with mental health and substance use disorders, there has been a greater focus on understanding the underlying mechanisms of the peer-to-peer relationship in this population. Thus far, one aspect of the alliance that has been examined is the peer supporter's ability to develop a bond with the participant. Peer supporters are uniquely positioned to offer acceptance and understanding (Chinman et al., 2008; Davidson et al., 2006). In one study, participants described that peer supporters were able to demonstrate greater understanding of their experiences and facilitate a stronger bond (Coatsworth-Puspoky et al., 2006). Qualitative studies indicate how the peer supporter is able to leverage their shared lived experience to build a trusting relationship (Coatsworth-Puspoky et al., 2006; Gillard et al., 2014). Participants also report that peer supporters help to normalize experiences and increase willingness to be open about difficult experiences that they may be reluctant to share with providers (Gidugu et al., 2015). In a one-to-one peer support intervention to promote smoking cessation among individuals with severe mental health impairments, participants indicated a strong and consistent personal bond with peer supporters (Dickerson et al., 2016). Beyond exploring

development of peer-supporter and participant bond, developing effective methods to quantify and measure the strength of the working alliance in peer support interventions is critical.

Two peer support intervention studies have rigorously examined the three components of working alliance as defined by Bordin (1979). These studies compared working alliance among individuals receiving mental health care from a case manager with and without a shared mental health disorder (Sells et al., 2006; Solomon et al., 1995). The initial study indicated no significant differences in working alliance among participants randomly assigned to receive care from a peer and a non-peer at 2-years post baseline (Solomon et al., 1995). Although no significant differences were found between the peer and non-peer case manager at 2 years post baseline, working alliance was found to predict treatment outcomes, such as treatment satisfaction, quality of life, and beliefs towards medication compliance across both groups (Solomon et al., 1995). Sells and colleagues (2006) completed a follow-up study to examine working alliance at shorter time intervals and found significantly higher alliance scores among participants receiving care from a peer at 6-months; however, differences were not found at 12-months. The authors of this study posit that this finding suggests that a peer supporter may develop a strong working alliance more rapidly; however, non-peers may be able to reach a similar working alliance at later time points (Sells et al., 2006).

1.4.1 Working Alliance over Time

Working alliance is a dynamic construct that may change over the course of treatment, and this pattern of change may influence treatment outcomes (e.g., Chiu et al., 2009; Kramer et al., 2009; Stiles et al., 2004; Stiles & Goldsmith, 2010). Although most studies in child and adolescent psychotherapy have assessed working alliance at one time point (Shirk et al., 2011), there has been a small but growing body of literature examining working alliance across multiple time points (Bickman, et al., 2012; Chiu et al., 2009; Chu et al., 2014; Duppong Hurley et al., 2015; Halfon et al., 2019; Kendall et al., 2009; Kivlighan & Shaughnessy, 2000). Various patterns in the working alliance trajectory have been identified in the literature. For example, findings from a family-based cognitive behavioral therapy intervention for youth with anxiety found a linear working alliance trajectory among youth, parent, and therapist raters that plateaued in the second half of treatment (Kendall et al., 2009). This same trajectory was found among therapists in a follow-up study, in which Chu and colleagues (2014) tested multiple growth curve models (e.g., linear, quadratic). Of note, participants in the follow-up study reported no significant changes in working alliance over time, which is consistent with other studies where multiple reporters (e.g., patient, therapist, observer) indicated stable or slight changes in working alliance pattern over time (Bickman et al., 2012; Hudson et al., 2014; Kazdin et al., 2006).

1.4.2 Characteristics Associated with Working Alliance

An important area of study in the working alliance literature is the examination of characteristics that may influence the development of a working alliance. One characteristic that has received increasing attention is the influence of therapist-patient concordance, defined by the therapist and patient holding the same identity characteristic (e.g., same gender identity, same racial identity). Although therapist-patient concordance has been identified as a preference among patients, empirical studies have found mixed evidence for the relationship between concordant therapist-patient characteristics and working alliance (e.g., Cabral & Smith, 2011; Schmalbach et al., 2022). In the context of peer support, the social cognitive and self-comparison theories posit that the degree of perceived similarity with the model influences the likelihood for cognitive and behavioral change (Bandura, 1986; Festinger, 1954). However, the relationship between peer-to-peer concordance and working alliance remains unexplored. Findings from some peer support interventions suggest that concordant race/ethnicity and primary language is associated with outcomes (Charlot et al., 2015; Ojeda et al., 2021). Further research is warranted in examining the relationship between participant-peer supporter concordance and working alliance.

1.5 Summary and Rationale

Peer support is a developmentally informed approach that can be leveraged to meet the unique psychosocial needs of AYAs with a COCC. Still, an understanding of the underlying mechanisms in such interventions remains limited. Working alliance serves as one well-established construct that can be used to understand the participant-peer supporter relationship. To date, there is limited understanding of how working alliance develops longitudinally within peer support modalities (Thompson et al., 2022). Despite the growing focus on peer support interventions for AYAs with a COCC, to the author's knowledge, no studies to date have examined the working alliance trajectory in a peer support intervention for AYAs with a COCC. A better understanding of the underlying mechanisms in the peer-to-peer relationship is needed to inform efforts to design peer support interventions for AYAs with a COCC.

2. Research Aims

The overall goal of this exploratory study is to describe the working alliance across the first four sessions among AYAs with a COCC receiving one-to-one telephone-based peer coaching to promote self-management and patient activation. Additionally, the study aims to (a) identify AYA, peer coach, and dyadic characteristics that influence the working alliance trajectory and (b) describe key aspects of the AYA-peer coach relationship over time using observer coding. The study will specifically aim to:

2.1 Primary Aims

Primary Aim 1: Describe the trajectory of AYA overall working alliance across sessions 1-4 of the peer coaching intervention.

Hypothesis 1: There will be a significant increase in AYA overall working alliance scores across the four sessions of peer coaching.

Primary Aim 2: Identify individual characteristics associated with the trajectory of AYA's overall working alliance across sessions 1-4 of the peer coaching intervention.

Hypothesis 1: AYA's gender, race, age, education level, and COCC category will influence the AYA's overall working alliance trajectory across sessions 1-4.

Hypothesis 2: Peer coach's gender, race, and COCC category will influence the AYA's overall working alliance trajectory across sessions 1-4.

Primary Aim 3: Describe and compare the trajectory of AYA's overall working alliance across sessions 1-4 of the peer coaching intervention among AYAs with and without concordant AYA-peer coach characteristics (gender, race, age, COCC, and total number of concordant characteristics).

Hypothesis 1: The AYA's overall working alliance trajectory will differ among AYAs in which the gender of the AYA-peer coach dyad is concordant compared to those AYAs in which the dyad is discordant.

Hypothesis 2: The AYA's overall working alliance trajectory will differ among AYAs in which the race of the AYA-peer coach dyad is concordant compared to those AYAs in which the dyad is discordant.

Hypothesis 3: The AYA's overall working alliance trajectory will differ among AYAs in which the age of the AYA-peer coach dyad is concordant compared to those AYAs in which the dyad is discordant.

Hypothesis 4: The AYA's overall working alliance trajectory will differ among AYAs in which the COCC of the AYAs -peer coach dyad is concordant compared to those AYAs in which the dyad is discordant.

Hypothesis 5: The AYA's overall working alliance trajectory will differ among dyads with greater total concordant characteristics compared to those AYAs in which the dyad has fewer concordant characteristics.

2.2 Secondary Aims

Secondary Aim 1: Describe the association between AYA overall working alliance and study engagement.

Hypothesis 1: The AYA's median overall working alliance score for all assessments completed will be positively correlated with study engagement, defined as the total number of coaching sessions completed.

Secondary Aim 2: Using qualitative methods, describe and rate key aspects of the AYA-peer coach relationship over time.

3. Methods

3.1 Design

This exploratory substudy was a supplemental component of a larger clinical trial, funded by the National Institute of Nursing Research, entitled “Peer i-Coaching for Activated Self-Management Optimization (PiCASO).” PiCASO was designed to compare the efficacy of a peer coaching intervention relative to an attention control group on AYA self-management and patient activation outcomes (R01NR018379-01: PI: Docherty/Maslow). The clinical peer coaching intervention is designed to connect an AYA, ages 16-22 with a COCC, by phone with a trained peer health coach who is also a young adult with a COCC, ages 18-26, upon intake. Trained and supervised peer coaches help and guide the AYA to identify and progress towards health behavioral change (see Chapter 4 for a detailed overview of the PiCASO intervention). The study was approved by the Duke University Health System Institutional Review Board (IRB#00102191)

3.2 Participants

3.2.1 AYAs

Eligibility for inclusion in the parent study includes the following criteria: (1) 16-22 years of age; (2) diagnosed with a COCC; (3) read and speak English (4) have access to a Smart Phone. AYAs were excluded if they have a cognitive disability which hinders their ability to provide informed consent.

AYAs were recruited from sub-specialty clinics at Duke University Medical Center as part of the larger PiCASO parent study. In the PiCASO intervention, AYAs were identified using a non-categorical approach rather than focusing on one specific illness group. This method is consistent with previous literature that suggests there are more differences within illness groups than between them (Perrin et al., 1993; Stein & Jessop, 1989). COCCs were categorized into three groups based upon associated burden, chronicity, and impairment (see Table 1): (1) frequent hospitalizations or Emergency Department (ED) visits, (2) high daily management with intermittent flares, and (3) survivor of life-threatening condition requiring ongoing symptom management. AYAs and peer coaches were matched based on shared COCC category. For example, a peer coach with sickle cell disease was matched with an AYA with sickle cell disease, chronic kidney disease or lupus. For AYAs presenting with multiple COCCs which spanned multiple COCC categories, PiCASO study staff selected one COCC category based on

factors including the extent of which the disease was life threatening and/or impacted day-to-day functioning. For example, an AYA or peer coach with an organ transplant and type 1 diabetes, was categorized in Survivor of life-threatening condition requiring ongoing symptom management.

Table 1: PiCASO Intervention Sample

COCC Category	COCC Diagnosis
Frequent hospitalizations or ED visits	Sickle cell disease, chronic kidney disease, lupus
High daily management with intermittent flares	Type 1 diabetes mellitus, inflammatory bowel disease, severe asthma
Survivor of life-threatening condition requiring ongoing management	Stem cell transplant, organ transplant, cancer survivor

3.2.2 Peer Coaches

In order to be eligible to be a peer coach in the parent study, individuals must be 18-26 years old upon intake and have been diagnosed with a COCC. Peer coaches were recruited by clinical staff at Duke University Medical System and identified for their ability to exhibit self-management skills. Peer coaches were hired as part-time employees at Duke University Medical Center and received approximately 50 hours of training, followed by weekly individual and monthly group supervisory sessions (see Chapter 4 for a detailed overview of the PiCASO intervention training model).

3.2.3 Substudy Sample

The present substudy examined AYA-peer coach dyads. AYAs enrolled and randomized to the peer coach intervention arm of the PiCASO study who initiated coaching between January 2021 and November 2021 were included in the present substudy. Peer coaches were assigned AYAs based on shared COCC category and mutual time availability, and some peer coaches were paired with more than one AYA. AYAs were excluded if they withdrew from the study before Session 1 and/or did not complete any alliance assessments.

3.3 Procedure

The substudy included working alliance data collected from AYAs for the first 3 months of the 12-month intervention. Following consent, AYAs in the PiCASO study completed a set of baseline measures via RedCap (Harris et al., 2009, 2019) hosted at Duke University, which included an enrollment form, completed by a study staff member, and a demographic questionnaire, completed by the AYA. Given findings indicating the importance of the development of working alliance in initial sessions (Labouliere et al., 2017; Lutz et al., 2009; Zilcha-Mano & Errázuriz, 2017), this study assessed the working alliance trajectory across the first four sessions of the PiCASO peer coach intervention.

AYAs and peer coaches connected via the InquisitHealth Mentor 1:1™ Web Based Portal mobile telephone/text platform (InquisitHealth, 2022). Following each session, AYAs received a RedCap Survey with the Therapeutic Alliance Quality Scale (TAQS) via the Web Based Portal used to facilitate peer coach and AYA interactions (InquisitHealth, 2022). AYAs were compensated for their participation in the parent PiCASO study, receiving \$30 after completing each of the five assessments for a total of \$150. AYAs received no additional compensation for completing items for the present substudy.

3.5 Measures

3.5.1 AYA Working Alliance

Working alliance from the perspective of the AYA was assessed using the Therapeutic Alliance Quality Scale (TAQS), which is a 5-item self-report questionnaire developed to measure the perceived working relationship between youth and a clinician in an outpatient psychotherapy setting. The TAQS was developed based on Bordin's conceptual model of therapeutic alliance, which includes the personal bond developed between the youth and counselor, in addition to the agreement upon goals for treatment, and tasks during session to achieve desired goals (Bickman et al., 2012; Bordin, 1979). As working alliance is a dynamic construct (Bickman et al., 2012), the scale is session-based and intended to capture the working alliance within each session.

The scale was developed in the context of out-patient counseling settings, included multiple iterative processes, and was found to have strong psychometric properties (Bickman et al., 2007; Riemer et al., 2012). In efforts to reduce time burden, the TAQS includes five items with one underlying factor (Riemer et al., 2012). While the scale was developed in the context of youth out-patient psychotherapy, it has been validated in other settings such as residential settings (Hurley, et al., 2013).

As the TAQS was designed to measure the working alliance in the context of outpatient counseling, the scale was slightly modified to reflect the peer coaching relationship in the present study (see Table 2). The developers of the TAQS approved the use of this scale for the present study. The scale consists of 5 items on a 5-point Likert scale, ranging from 1=*Not at all* to 5=*Totally*. An overall working alliance score was calculated by obtaining the mean score for the 5 items, with a possible range of 1 to 5 and higher overall scores indicating greater working alliance.

Table 2: Modified Therapeutic Alliance Quality Scale

TAQS Items	Not at all (1)	Only a little (2)	Some- what (3)	Quite a bit (4)	Totally (5)
Did this session head in the direction that you wanted?					
Did you understand the things that your peer coach said in this session?					
Did you and your peer coach work on problems together in session?					
In this session, did you feel that your peer					

coach would stick with you no matter what you shared?					
In this session, did you feel that your peer coach understood what it feels like to be you?					

3.5.2 AYA Characteristics

For analyses in the present study, the following AYA demographic and clinical characteristics were abstracted from the PiCASO RedCap surveys collected at baseline. Self-identified gender was classified into female and male. AYA race was self-identified and categorized into White and Black/African American. AYA age was defined by the age at the first peer coaching session in the dyad and classified into two groups: (1) 16-18 years and (2) 19-23 years. AYAs self-identified highest education level completed, which included two categories: (1) less than high school and (2) high school diploma or greater, as the age range of AYAs were younger and education was primarily in this range. PiCASO study staff categorized the AYA’s COCC into one of three COCC categories at baseline (See Table 1 for breakdown). Additional variables were abstracted to describe the AYA sample, including the following variables self-identified by AYAs at baseline: Hispanic/Latino, age of COCC onset, presence of physical disability, and presence of learning disability.

3.5.3 Peer Coach Characteristics

For analyses in the present study, peer coach demographic characteristics (gender, race, age) were gathered from the InquisitHealth Mentor 1:1™ web-based

platform profile (InquisitHealth, 2022), which was completed by each peer coach prior to coaching. Clinical characteristics (COCC category) were collected from PiCASO study staff upon enrollment. Peer coach self-identified gender was classified into female and male. Peer coach race was self-identified and categorized into White and Black/African American. Peer coach age was defined by age at the first peer coaching session in the dyad. PiCASO study staff categorized the peer coach's COCC into one of three peer coach COCC Categories at baseline (See Table 1 for breakdown). Additional variables were abstracted from the InquisitHealth Mentor 1:1™ web-based platform profile (InquisitHealth, 2022) to describe the peer coach sample, including whether the peer coach self-identified as Hispanic/Latino.

3.5.4 AYA-Peer Coach Concordance

Concordant gender, race, age, and COCC were each defined by the AYA and peer coach sharing the same characteristic. For each characteristic, the AYA-peer coach dyads were classified into one of two dyad groups (concordant vs discordant).

Concordant gender was defined by the AYA and peer coach self-identifying with the same gender identity. Concordant race was defined by the AYA and peer coach self-identifying with the same racial identity. Concordant age was defined by the AYA and peer coach being within 3 years, 0 months, and 0 days. Concordant COCC was defined by the AYA and peer coach presenting with the same COCC. Of note, for each AYA and

peer coach in the PiCASO intervention presenting with multiple COCCs, PiCASO study staff selected one COCC which was based on factors including the extent of which the disease was life threatening and/or impacted day-to-day functioning. For example, an AYA or peer coach with cancer and inflammatory bowel disease diagnoses was selected by study staff to have cancer as the COCC. Lastly, the total number of concordant characteristics present (gender, race, age, COCC) was calculated for each dyad. AYA-peer coach dyads were classified into one of three groups (0 concordant characteristics, 1 concordant characteristic, 2 or more concordant characteristics). Of note, in dyads in which an AYA switched to a new peer coach in the 3-month interval, the initial peer coach was used in concordant analyses.

3.5.6 AYA Study Engagement

Study engagement was defined as the total number of sessions completed by the AYA within 3 months of session 1.

4. PiCASO Intervention Overview

The Peer i-Coaching for Activated Self-Management Optimization (PiCASO) intervention is a randomized control trial targeting AYAs with a COCC that examines the effect of a telephone-based peer coaching intervention on self-management and patient activation outcomes. AYAs randomized to the peer coaching arm receive peer coaching over the course of 1 year from a trained and supervised young adult peer

coach living with a similar COCC (in the same COCC category) who has successfully transitioned to adult care. The PiCASO intervention is rooted in self-determination theory and aims to promote AYAs' intrinsic motivation, by providing support and guidance towards self-identifying and pursuing behaviors that align with their self-identity and values (Ryan & Deci, 2000).

Peer coaching is provided by trained and supervised peer coaches who are hired as part-time employees at Duke University Medical Center. Peer coaches receive approximately 50 hours of training, which includes development of core active listening and motivational interviewing techniques, along with an overview of the peer coaching model. If peer coaches were not able to demonstrate core competences in training, they were asked to conduct practice sessions with a supervisor to address the concern prior to beginning coaching. Following training, peer coaches receive weekly individual supervision by a licensed mental health professional and semi-monthly group supervisory sessions for continued education and support. To monitor fidelity to the coaching model, supervisors conduct a weekly review of 1 peer coaching session for each peer coach, and appropriately address any discrepancy from the coaching model.

Peer coaches is held weekly over the first phase, (approximately 3 months) bi-weekly over the second phase (approximately 3 months), and monthly in the maintenance phase (approximately 6 months). In order to transition from the first to

second phase of peer coaching, AYAs must complete at least six sessions and have identified a small weekly goal. Over the first three months, the AYA and peer coach are expected to meet on a weekly basis to help build connection. The introductory session serves as the first meeting and facilitates an opportunity for the AYA and peer coach to learn about one another and build rapport. During this interaction, the peer coach demonstrates interest in the AYA and utilizes self-disclosure (e.g., interests, hobbies, experiences as an AYA living with a COCC) in efforts to build trust and rapport. Following the introductory session, the peer coach and AYA explore the AYA's vision and hopes for their future as well as related values and guiding concepts. During this process, the peer coach facilitates an exploration of the AYA's values that are consistent with their vision for their future. Afterward, the AYA completes an assessment of their health and well-being to identify their current and desired functioning in each area (e.g., medication adherence, exercise). In the third phase of coaching, AYAs identify an area of change they would like to focus on (e.g., improving medication adherence) to develop a short-term (3-6 months) behavioral goal consistent with the SMART goal framework (e.g., "In 3 months, I want to take my prescribed medication independently each morning at 9am"). In the final coaching phase, the peer coach provides ongoing support to the AYA in identifying and pursuing small weekly and bi-weekly goals (e.g., researching mobile applications that set reminders to take medication, speaking with

parent to facilitate greater independence with medication). During these sessions, the peer coach celebrates the AYA's accomplishments and explores progress and lessons learned prior to developing a new bi-weekly goal. A more detailed overview of the intervention is described in Pollock and colleagues (2022).

5. Data Analytic Approach

Descriptive statistics were used to detail the AYA characteristics, peer coach characteristics, and overall working alliance scores at each assessment point. Median (*Mdn*) and 25th, 75th percentiles were used to describe continuous measures due to the small sample size and skewness observed in their data distributions at either enrollment or each peer coaching session. When statistical significance testing was performed, non-directional tests were conducted with the level of significance for each test set at 0.05. This exploratory substudy focused on describing working alliances and its association with patient and peer coach characteristics and effect sizes to inform the planning of future studies. Data analyses were conducted via SAS 9.4 (SAS Institute, Cary, NC).

Aim 1 Analysis. A linear random coefficients regression models for longitudinal data (RRM), a type of hierarchical multi-level, mixed-effect model for repeated measurements, was conducted to characterize the trajectory of AYA overall working alliance across time (sessions 1-4) of the peer coaching interventions. Fixed effects were time, while random effects were AYA and time-by-AYA.

Aim 2 Analysis. RRM s were also conducted to identify the association of each individual characteristic (AYA and peer coach) with the trajectory of AYA overall working alliance across sessions 1-4 of the peer coaching intervention. A separate trajectory analysis was conducted for each characteristic due to the exploratory nature of the study and the small sample size prohibited covariate-adjusted multivariable trajectory models. AYA characteristics were gender, race, age, education level, COCC category, while peer coach characteristics were gender, race, COCC category. Each characteristic and its interaction with time were added as fixed effects to the RRM applied in Aim 1 to compare the influence of each characteristic on the overall working alliance scores over time.

Aim 3 Analysis. RRM s were also conducted to describe and compare the trajectory of AYA overall working alliance across sessions 1-4 of the peer coaching intervention among AYAs with and without concordant AYA-peer coach characteristics. Concordance characteristics were gender, race, age, COCC. A separate trajectory analysis was conducted for each characteristic. Each concordance characteristic and its interaction with time were incorporated as fixed effects to the RRM described in Aim 1 to compare those with and without concordance for the characteristics on the overall working alliance score over time. We also examined the influence of total number of concordant characteristics on working overall alliance over time.

Aim 4 Analysis. A Spearman correlation analysis was conducted to determine the association between the median overall working alliance score per AYA and study engagement, defined by the total number of sessions completed in the 3-months following the first session.

Statistical Power. This exploratory and descriptive substudy had a sample size of 32 AYA-peer coach dyads, which did not yield at least 80% power to test for the trajectory and correlational analyses performed, assuming small to medium effects and two-tailed significance set at 0.05. Therefore, the focus was on describing patterns and effect sizes, when applicable.

Aim 5 Analysis. See Chapter 5 for detailed overview.

6. Results

6.1 AYA and Peer Coach Characteristics

A total of 32 AYA-peer coach dyads enrolled in the parent study during this timeframe were recruited for the substudy. There were no AYAs who declined to participate in the substudy. Of the 32 AYAs included in analysis, 2 AYAs switched to a new peer coach during the 3-month interval due to peer coach resignation. The AYA median age at session 1 was 19.4 (range: 16.1 to 23.0) with 62.5% self-identifying as female. Fifteen self-identified as Black/African American (46.8%) and 15 self-identified as White/Caucasian (46.8%). The peer coach median age at session 1 was 22.4 (range: 19.3,

28.4). Most of the peer coaches self-identified as female (55.6%), with 44.4% self-identifying as White/Caucasian and 27.8% self-identifying as Black/African American.

AYA and peer coach characteristics are summarized in Table 3.

Table 3: AYA/Peer Coach Characteristics

	AYAs (N=32) n (%)	Peer Coaches (N=18) n (%)
<i>Age, in years*</i>	19.4 (17.9-20.6)	22.4 (20.3-23.7)
<i>Female gender</i>	20 (62.5%)	10 (55.6%)
<i>Hispanic/Latino</i>	2 (6.3%)	0 (0.0%)
Race		
White	15 (46.9%)	8 (44.4%)
Black/African American	15 (46.9%)	5 (27.8%)
Asian	0 (0.0%)	3 (16.7%)
Unknown	2 (6.3%)	0 (0.0%)
Other	0 (0.0%)	2 (11.1%)
Education level		
Some High School	12 (37.5%)	
High School Graduate	15 (46.9%)	
Vocational/Technical Training	1 (3.1%)	
Associate Degree Program	2 (6.3%)	
Bachelor's Degree Program	2 (6.3%)	
COCC Age of Onset		
Infant/Toddler: Birth-23 months	5 (15.6%)	
Early Childhood 2-5 years	3 (9.4%)	
Childhood: 6-9 years	6 (18.8%)	
Adolescence: 10-17 years	16 (50.0%)	
Adulthood: 18-26 years	1 (3.1%)	
Unknown	1 (3.1%)	
Physical disability	2 (6.3%)	
Learning Disability	3 (9.4%)	

Note. *Median (25th-75th percentile); AYA Education range: Grade 9- Bachelor's Degree Program.

AYA-peer coach dyads were matched on COCC category. Of the 32 AYA-peer coach dyads, a breakdown of the COCC categories can be found in Table 4. The COCC categories across dyads were similar, with the majority of dyads in the category of high daily management with flares.

Table 4: AYA-Peer Coach Dyads (N=32)

	n (%)
<i>COCC Category</i>	
Frequent hospitalizations/ED visits	9 (28.1%)
High daily management with flares	12 (37.5%)
Survivor of life-threatening condition	11 (34.4%)

Within AYA-peer coach dyads, the total number of coaching sessions completed in the 3-month study interval ranged from 2 to 13 (*Mdn* =8.0, 25th, 75th percentile=5.0, 10.0). The total number of working alliance measures completed in the 3-month interval also ranged from 2 to 13 (*Mdn*=6.0, 25th, 75th percentile=5.0, 10.0). Among the working alliance assessments completed by the AYA, none of the item-level data were missing and, thus, imputation was not necessary.

6.2 AYA Overall Working Alliance Trajectory (Aim 1)

AYAs had a high overall working alliance following the introductory session (*unadjusted Mdn* = 4.6), which remained stable across subsequent sessions (see Figure 1, Table 5). The trajectory analysis indicated no significant change in overall working alliance scores across the four sessions for the 32 AYAs ($p=0.4226$).

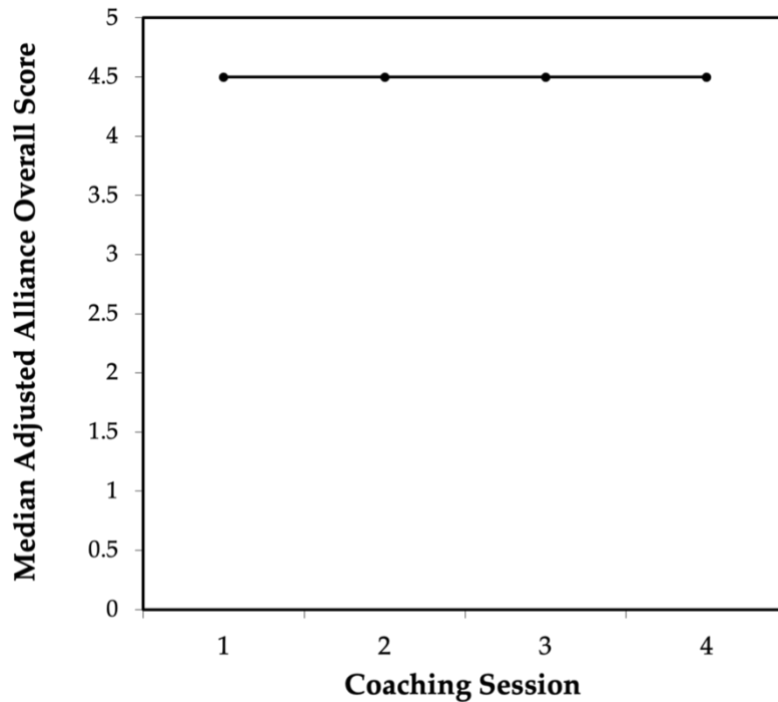


Figure 1: AYA Overall Working Alliance Scores Across Time

Table 5: AYA Alliance Item Scores and Overall Working Alliance Scores

Unadjusted Alliance Scores	Session 1 Median (25 th , 75 th)	Session 2 Median (25 th , 75 th)	Session 3 Median (25 th , 75 th)	Session 4 Median (25 th , 75 th)
Alliance Items	N=29	N=29	N=24	N=22
Q1: Did this session head in the direction that you wanted?	5.0 (5.0, 5.0)	5.0 (4.0, 5.0)	5.0 (4.0, 5.0)	5.0 (4.0, 5.0)
Q2: Did you understand the things that your peer coach said in the session?	5.0 (4.0, 5.0)	5.0 (4.0, 5.0)	5.0 (4.0, 5.0)	5.0 (5.0, 5.0)
Q3: Did you and your peer coach work on problems together in session?	3.0 (3.0, 5.0)	4.0 (3.0, 5.0)	5.0 (3.5, 5.0)	5.0 (4.0, 5.0)
Q4: In this session, did you feel that your peer coach would stick with you no matter what you shared?	5.0 (5.0, 5.0)	5.0 (5.0, 5.0)	5.0 (5.0, 5.0)	5.0 (5.0, 5.0)
Q5: In this session, did you feel that your peer coach understood what it feels like to be you?	5.0 (4.0, 5.0)	5.0 (4.0, 5.0)	5.0 (4.0, 5.0)	5.0 (4.0, 5.0)
Overall Working Alliance Score				
Unadjusted scores	4.6 (4.2, 5.0)	4.6 (4.2, 5.0)	4.9 (4.0, 5.0)	4.9 (4.4, 5.0)
Adjusted scores	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)

6.3 Individual Characteristics and Working Alliance Trajectory (Aim 2)

The trajectory analyses examining the influence of individual (AYA and peer coach) characteristics on overall working alliance scores across the first four coaching sessions did not demonstrate any significant main or interaction effects of the time or the individual characteristics (all $p > 0.05$). Appendices B and C (Tables 9-12) provides the results for each model and median values at each time point for different levels of the individual characteristics.

6.4 AYA-Per Coach Concordance and Working Alliance Trajectory (Aim 3)

Table 6 presents the number and percent of AYA-peer coach dyads with and without concordance for gender, race, age, COCC as well as for total number of concordant characteristics. The majority of the dyads in the sample had 2 or more concordant characteristics.

Table 6: AYA-Peer Coach Concordance (N=32)

	n (%)
<i>Individual Concordance Characteristics</i>	
Concordant gender	18 (56.3%)
Concordant race	13 (40.6%)
Concordant age	14 (43.8%)
Concordant COCC	9 (28.1%)
<i>Concordance Total</i>	
0 concordant characteristics	5 (15.6%)

1 concordant characteristic	5 (15.6%)
2 or more concordant characteristics	22 (68.8%)

The concordance characteristics did not significantly influence the overall working alliance scores, nor did the concordance groups significantly differ in alliance across time (concordance main and interaction effects: $p > 0.05$, see Appendix C, Tables 13 and 14). Although not a statistically significant interaction effect ($p = 0.0834$), dyads with a discordant COCC tended to show an increase in alliance over time while dyads with a concordant COCC had a slight decrease in alliance over time (see Figure 2).

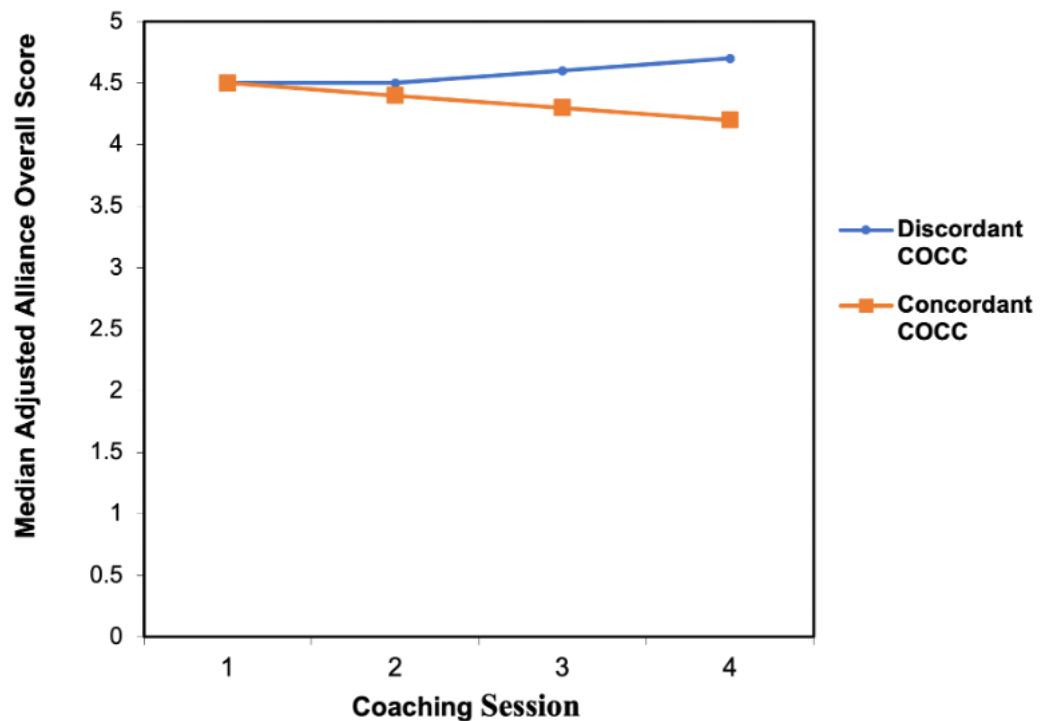


Figure 2: AYA Overall Working Alliance Scores and COCC Concordance Across Time

6.5 Working Alliance and Study Engagement (Aim 4)

Median overall working alliance scores per AYA was not significantly associated with AYA study engagement ($r_s = -.02$, $n = 30$, $p = .9263$). Less than 0.05 of the variability of study engagement scores were explained by overall working alliance scores ($r_s^2 = 0.0004$).

6.6 Effect Sizes

Slope coefficients estimated for the trajectory analyses indicated minimal change and very small effect sizes regarding change in working alliance across time. Further, very small effects were observed when comparing the trajectory changes across time for groups of individuals based on AYA, peer coach, or concordance characteristics. The coefficient of determination of 0.0004 for the relationship of median overall working alliance and study engagement also demonstrated minimal effects.

7. Qualitative Component (Aim 5)

7.1 Methods

7.1.2 Participants

For qualitative analysis aimed at describing core aspects of the AYA-peer coach relationship, AYA-peer coach dyads were purposively sampled from the present sub-study sample based on AYA and peer coach individual and dyadic characteristics.

7.1.3 Procedure

An additional exempt study was approved by the Duke University Health System Institutional Review Board (IRB# Pro00106698) to analyze recordings of coaching sessions. Peer coaches provided informed consent. Peer coaching sessions lasted for approximately 25 minutes, and audio recordings were transcribed verbatim. Given the variability in the number of sessions completed in the 3-month interval, select sessions were identified purposefully to capture both the early sessions strictly focused on building rapport and identifying the AYA's vision for optimal health, in addition to later sessions, focusing on behavioral change. If analysts identified notable changes in peer coach use of skills, AYA responsiveness, or AYA-peer coach rapport between early and late sessions, analysts reviewed intermediary sessions to identify emerging patterns.

Analysis was completed in four steps using multiple coding methodologies (Miles et al., 2014). Audio recordings and transcripts of coaching sessions were coded by one of two undergraduate analysts trained in conversation analysis. First, analysts used a rating system developed based on clinical competency measures for non-professionals (Friis et al., 2021; Kohrt et al., 2015). Specifically, analysts rated the peer coach on a wide range of a priori competencies, including general clinical skills (e.g., warmth and empathy, collaborative processing, etc.), as well as a key variable of interest (e.g., disclosure of similar life experiences). Second, after reviewing and rating each session,

analysts developed a brief data memo (1-3 sentences) to abstract central components in the AYA-peer coach relationship (Birks et al., 2008). Additionally, after reviewing each session, analysts identified and described any verbal interactions that strengthened and/or weakened the relationship. Third, after completing analysis for each selected session in the dyad, the analyst developed a data memo (1-3 paragraphs) to abstract central components in the AYA-peer coach relationship in the dyad. Lastly, all analysts completed six in-depth consensus meetings in which each dyad was presented on a session and dyad level to distill and come to consensus on core themes. Consensus meetings were exploratory and open-ended, oriented toward discovering aspects of peer coaching that may be different from other support modalities. The initial rating served as a formative step in analysis and as such is not reported in this study. The present study will focus on core themes identified through data memos and consensus meetings.

7.2 Results

7.2.1 AYA and Peer Coach Characteristics

Nine AYA-peer coach dyads were purposively sampled and a total of 52 audio recorded coaching episodes were transcribed and analyzed to describe key aspects of the working relationship over time. The AYA median age at session 1 was 19.48 (range: (25th, 75th percentile=18.23 – 20.42), including 66.7% (N=6) self-identified as Black/African American and 33.3% (N=3) self-identified as White/Caucasian. The majority of the

sample self-identified as female (N=6) followed by male (N=3). The peer coach median age at session 1 was 20.82 (25th, 75th percentile=20.10 – 23.28). The majority of the sample self-identified as female gender (N=5) and self-identified as White (N=4), or Black/African American (N=3). The breakdown of dyad concordance included in the qualitative analyses can be found in Table 7. In one dyad, the AYA switched to another peer coach after session 3 due to peer coach resignation.

Table 7: AYA-Peer Coach Concordance (Qualitative Component)

	n (%)
<i>COCC Category</i>	
Frequent hospitalizations/ED visits	2 (22.2%)
High daily management with flares	2 (22.2%)
Survivor of life-threatening condition	5 (55.6%)
<i>Concordance</i>	
Concordant age	5 (55.5%)
Concordant gender	4 (44.4%)
Concordant primary COCC	1 (11.1%)
Concordant age of COCC onset	1 (11.1%)
Concordant total*	2 (1-3)

*Note. *Median (25th-75th percentile)*

7.2.2 Theme Overview

Three overarching themes describing the peer coach’s use of skills were identified across AYA-peer coach dyads. First, warmth, empathy, and genuineness was a theme defined as the extent to which the peer coach displayed care and understanding towards the AYA in an authentic manner when discussing challenges associated with

being an AYA with a COCC, which included verbal responses (e.g., “That sounds really hard.”) and nonverbal responses (e.g., warm tone). Second, integrating shared experience was a theme defined as the extent to which the peer coach disclosed similar life experiences, which ranged from brief acknowledgement (e.g., “Yeah, I totally get that.”) to more detailed disclosure (“I also understand that battle: maintaining your weight and also staying healthy...”). Third, peer coach alignment with AYA’s goals was an emergent theme defined as the extent to which the peer coach identified and incorporated the desires of the AYA in the intervention. Within each theme, there was variability in the extent to which peer coach skills were displayed. Across themes, there were instances in which the skill was present (defined as “high”) and there were instances in which the peer coach missed an opportunity (defined as “low”) to use the skill (see Table 8). Within each theme, static and temporal patterns emerged that uniquely influenced the development of the AYA-peer coach relationship, described below.

Table 8: Examples of High and Low Codes Across Themes

	Warmth, Empathy, and Genuineness	Integrating Shared Experience	Aligning with AYA’s Goals
High	<p><u>AYA</u>: “Uh, I had a fever from it again, and then, starting last night I started having chest pains.”</p> <p><u>Peer Coach</u>: “I hope you’re feeling better now.”</p> <p><u>AYA</u>: “I feel a little better.”</p> <p><u>Peer Coach</u>: “Okay. Well, if at any point in the call you feel too uncomfortable like pain-wise or anything, we can always just stop</p>	<p><u>AYA</u>: “Soccer was fun for me. I played soccer before I got sick and then, um, I want to say elementary school to middle school was basketball. I ain’t [do not] really enjoy basketball as much. I think soccer was my sport.”</p> <p><u>Peer Coach</u>: “Yeah. We’re almost twins in that area right there. I played soccer for many years and I</p>	<p><i>After AYA described disinterest in pursuing behavioral change</i></p> <p><u>Peer Coach</u>: “We will take a step back from the goal setting and the coaching process and just like talk a little bit and get to know each other more This is a low-pressure environment, so I want to get to know you and be able to talk to you.”</p>

<p>the call and we can do next week. So just, don't hesitate to let me know."</p> <p><i>In response to AYA's uncertainty related to developing a behavioral goal using "SMART" acronym:</i></p> <p><u>AYA</u>: "Alright. Okay, um, I'm trying to think. I don't really ... so I just don't know where to start sometimes."</p> <p><u>Peer coach</u>: "Yeah, yeah. And I'm here to help you through the process. I know just throwing that acronym out there kind of makes it a little bit overwhelming but just so you have the guidelines of how we're going to create a goal that you can work towards in your sleep."</p>	<p>played basketball for maybe like, I think [since I was] 4. Basketball was cool, but it wasn't my favorite. Soccer though, I absolutely love soccer. Soccer has my heart."</p> <p><u>Peer coach</u>: "Oh wow. Well, that's like the same. We're kinda like the same people cause I was diagnosed back on my [age] birthday."</p> <p><u>AYA</u>: "That's rude, that's rude."</p> <p><u>Peer coach</u>: "I know"</p> <p><u>AYA</u>: "What a way to introduce yourself to teenagerhood."</p> <p><u>Peer coach</u>: "I know, right?"</p>	<p><u>Peer Coach</u>: "I am so glad you brought that up on our first because now I know that, going day by day is going to work much better for you and I do not want you taking those side steps back or getting more stressed out by these calls so thank you for being so honest."</p>
<p>Low <u>AYA</u>: "I picture to have friends. I don't have friends now. My parent worked in [occupation] so I move a lot and when I have friends and I move they stop talking to me. So, in five years I would like to have a couple of friends. I have one friend but she [lives] many hours away from me."</p> <p><u>Peer Coach</u>: "Oh"</p> <p><u>AYA</u>: "Yeah"</p> <p><u>Peer Coach</u>: "Is your parent currently in [occupation]?"</p>	<p><u>AYA</u>: "Work is going good. Um, I just changed my hours because I just felt like I wasn't able to do all the things I wanted to do. So"</p> <p><u>Peer Coach</u>: "Mm."</p> <p><u>AYA</u>: "It's better now."</p> <p><u>Peer Coach</u>: "Yeah, so meaning like between work and school you were just kind of like, uh, that was kind of your two things?"</p> <p><u>AYA</u>: "Mhmm"</p>	<p><u>Peer Coach</u>: "[What] were some areas that, you know, you felt more stuck or stood out to you...?"</p> <p><u>AYA</u>: "I don't think I felt that way about any of the questions that you asked."</p> <p><u>Peer Coach</u>: "Okay. You don't think you felt that way... Um, is there anything, you know, of those things that you really feel like sticks out to you?"</p>

7.2.3 Warmth, Empathy, and Genuineness

7.2.3.1 High Warmth, Empathy, and Genuineness

In response to AYA disclosure about experiences of being an AYA with a COCC, there were instances in which peer coaches displayed high warmth and empathy in a genuine manner. In one dyad, the peer coach displayed high warmth and empathy in response to AYA illness disclosure:

Peer Coach: “Thank you for sharing that and being vulnerable. The whole point of this program is to connect two people who have chronic illnesses, and I think that as much as I enjoy talking and mentoring people, I also feel just blessed to know about how these conditions affect other people besides my own condition. Thank you so much.”

The peer coach responded in a warm tone, indicating gratitude and understanding. In another dyad, the AYA described physical symptoms related to their COCC, and the peer coach responded with empathy and understanding, making clear that the AYA’s health and comfort was paramount:

AYA: “Uh, I had a fever from it again, and then, starting last night I started having chest pains.”

Peer Coach: “I hope you’re feeling better now.”

AYA: “I feel a little better.”

Peer Coach: “Okay. Well, if at any point in the call you feel too uncomfortable like pain-wise or anything, we can always just stop the call and we can do next week. So just, don’t hesitate to let me know.”

7.2.3.2 Low Warmth, Empathy, and Genuineness

There were also notable instances in which peer coaches missed opportunities to express warmth and empathy in a genuine manner in response to AYA disclosure. In one dyad, after the peer coach asked the AYA about their vision for their future, the peer

coach did not address the AYA's challenge pertaining to making friends and instead diverted the conversation to a different topic:

AYA: "I picture to have friends. I don't have friends now. My parent worked in [occupation] so I move a lot, and when I have friends and I move, they stop talking to me. So, in five years I would like to have a couple of friends. I have one friend but she [lives] many hours away from me."

Peer Coach: "Oh"

AYA: "Yeah"

Peer Coach: "Is your parent currently in [occupation]?"

In another dyad, the AYA vaguely referred to a challenge in the previous week:

Peer Coach: "You've been doing okay?"

AYA: "Oh yeah. Just ... but basically yeah, I'm good."

Peer Coach: "Sorry, I didn't hear you very well. Do you mind repeating what you said?"

AYA: "Oh, sorry about that. I said just a little struggle here and there, but I'm fine."

Peer Coach: "Okay well, I know you said that this is still a good time for us to talk..."

By directing the conversation away from the AYA's "struggle," the peer coach missed an opportunity to display warmth and empathy.

7.2.3.3 Transitioning from Role of "Peer" to "Coach"

Warmth, empathy, and genuineness served different functions as the peer coach transitioned roles from getting to know the AYA as a "peer" to assuming the role as a "health coach." Early displays of warmth, empathy, and genuineness functioned to establish rapport and lay a foundation for the coaching process. In later sessions focused on identifying and pursuing behavioral goals, warmth, empathy, and genuineness in the coaching process served to validate the AYA's difficulties and often facilitated AYA

eagerness to move forward through the coaching model. For example, in one dyad, the peer coach displayed warmth and empathy in response to AYA's uncertainty related to developing a behavioral goal using the "SMART" acronym:

AYA: "Alright. Okay, um, I'm trying to think. I don't really ... so I just don't know where to start sometimes."

Peer coach: "Yeah, yeah. And I'm here to help you through the process. I know just throwing that acronym out there kind of makes it a little bit overwhelming but just so you have the guidelines of how we're going to create a goal that you can work towards in your sleep."

AYA: "I feel like, especially with the way [I am] sometimes, I could definitely see like realistically being asleep by like 1, 2 a.m...."

In this example, after the peer coach displayed warmth and empathy, the AYA was more open with the peer coach about their challenges with sleep hygiene.

7.2.3.4 Becoming Robotic

Generally, warmth, empathy, and genuineness remained static across sessions. However, one pattern emerged in several dyads as peer coaches transitioned from the introductory session focused getting to know the AYA to future sessions focused on guiding the AYA towards behavioral change. Following the introductory call, many peer coaches became more monotone and sounded as though they were reading from a script. In one dyad, the AYA described difficulty with communication skills:

Peer Coach: "Okay, okay. Is it um, is it like you don't know how to start a conversation or you just don't want to start a conversation if that makes sense?"

AYA: "Uh that's mainly, uh, I don't know how."

Peer Coach: "Okay. Great, great, great. Sorry I was taking notes. Um, okay. What would you say, um, another strength is in this area?"

During this exchange, the peer coach appeared to be typing while the AYA was expressing vulnerable information, and then responded with enthusiasm after the AYA described a social difficulty. Generally, AYAs demonstrated less openness and responsiveness when working with peer coaches who became more monotone and sounded like they were reading off a script. Of note, a total of three AYAs in the sample were lost to follow-up within the three-month interval. Within two of the three dyads, there were substantive patterns in which the peer coach missed opportunities to express warmth, empathy, and genuineness.

7.2.4 Integrating Shared Experience

7.2.4.1 High Integration of Shared Experience

Integrating shared experience was used in response to AYA disclosure of personal interests and experiences. Peer coaches largely disclosed personal experiences around surface level areas (e.g., interests, hobbies, education/occupation status, etc.) to build rapport and trust with the AYA:

AYA: "Soccer was fun for me. I played soccer before I got sick and then, um, I want to say elementary school to middle school was basketball. I ain't [do not] really enjoy basketball as much. I think soccer was my sport."

Peer Coach: "Yeah. We're almost twins in that area right there. I played soccer for many years and I played basketball for maybe like, I think [since I was] 4. Basketball was cool, but it wasn't my favorite. Soccer though, I absolutely love soccer. Soccer has my heart."

Peer coaches also integrated shared experiences related to experiences being an AYA living with a COCC:

Peer Coach: "Oh wow. Well, that's like the same. We're kinda like the same people cause I was diagnosed back on my [age] birthday."

AYA: "That's rude, that's rude."

Peer Coach: "I know."

AYA: "What a way to introduce yourself to teenagerhood."

Peer Coach: "I know, right?"

7.2.4.2 Low Integration of Shared Experience

Missed opportunities to integrate shared experience in response to AYA disclosure included instances in which peer coaches did not attempt to relate to the AYA's experiences:

Peer Coach: "How is work going?"

AYA: "Work is going good. Um, I just changed my hours because I just felt like I wasn't able to do all the things I wanted to do. So"

Peer Coach: "Mm"

AYA: "It's better now."

Peer Coach: "Yeah, so meaning like between work and school you were just kind of like, uh, that was kind of your two things?"

AYA: "Mhmm"

In this example, the peer coach reflected what they heard, without attempting to relate to the AYA's experience in a genuine manner. In response, the AYA is minimally responsive.

Additionally, missed opportunities also included instances in which peer coach disclosure was tangential to AYA disclosure. In one dyad, when the AYA disclosed interest in romantic comedy movies, the peer coach response did not leverage disclosure to connect around shared interest in movies, but instead appeared dismissive and increasingly less relevant to AYA interests:

Peer Coach: “Yeah those, um, those are kind of cool. I definitely like action movies, mysteries, it’s hard for me to watch those like constantly when I’m so tired after work to and with everything I do you know it’s hard for me to want to sit down and watch like a serious movie that I have to pay attention too, so often times I end up watching like a comedy movie or something just more like you can just kind of zone in and out of it. Um yeah, I definitely like those movies as well. I saw one recently that was really good called [move title] ...I haven’t been going to the theater at all the last year with COVID so I’m definitely looking forward to seeing new movies as they come out.”

Peer coach disclosure was not consistent with the AYA’s interests, taking focus away from the AYA and limiting opportunities to build connection.

7.2.4.3 Transitioning from Role of “Peer” to “Coach”

Integrating shared experience served a different function as the peer coach transitioned roles from getting to know the AYA as a “peer” to assuming the role as a “health coach.” In early sessions, integrating the shared experience functioned to establish rapport and trust, and lay a foundation for the coaching process. A pattern emerged in which peer coach disclosure in the introductory session often prompted reciprocated AYA disclosure. For example, some peer coaches provided detailed disclosure about their COCC:

Peer Coach: “I have [specific COCC]. I was diagnosed in [year], so it’s the only thing I’ve known so on top of all that and balancing that, which I know you know a lot about...”

AYA: I was diagnosed with [specific COCC] at [age]...and I was diagnosed with [secondary condition] at [age].”

Other peer coaches disclosed less detail about their COCC, prompting less AYA disclosure:

Peer Coach: “My condition is *[insert condition]*. I was born with it. I like *[insert subject area]* a lot. I like cartoons. I play video games for the most part...”

AYA: “I’m *[insert name]*. I’m still a high school student, trying to figure out what I want to do. I tried to get into cartoons, but I think I got into the wrong one...”

In this case, the AYA followed the peer coach lead in the extent to which they disclosed detail about their COCC.

In later sessions, integrating the shared experience helped to facilitate AYA identification and pursuit of behavioral goals. For example, after an AYA reported difficulties with sleep hygiene, the peer coach integrated their shared experience:

Peer Coach: “Yeah, I totally get that. I know sometimes I look at my phone at night and I look at the time and it’s like been an hour so.”

AYA: “Yeah, especially on Twitter or something like that so I *[would]* be on that for hours.”

Peer Coach: “Yeah, I totally understand that challenge and I have the same problem. So, first let’s talk about what action step you can make and then we’ll kind of talk about that barrier of how to turn off the phone...What’s your action step gonna *[be to]* get you closer to consistent sleep?”

In this example, the peer coach was able to leverage their shared experience to validate the AYA’s experience prior to goal setting. Of note, as peer coaches transitioned from getting to know the AYA as a peer to working towards identifying and pursuing behavioral change, peer coach integration of shared experience became less frequent.

7.2.5 Aligning with AYA’s Goals

7.2.5.1 High Alignment

There were many instances in which peer coaches aligned with AYA’s desires in the coaching process. For example, in one dyad in which the AYA had recently switched

to a new coach, the current peer coach aligned with AYA's interest in slowing down the pace of the intervention:

AYA: "I don't know, I was thinking so hard when [prior coach] was asking questions about it. I was like, dang... They was [were] so long term too... I really [need to] take it day by day."

Peer Coach: "Back up a little bit."

AYA: "Take the short term. Yeah, cause [because] I was like, I won't be thinking that far. I just, I really take it day by day."

Peer Coach: "It sounds like the last person may have just kept pushing you, but I am so glad you brought that up on our first call because now I know that going day by day is going to work much better for you and I do not want you taking those side steps back or getting more stressed out by these calls so thank you for being so honest."

In another dyad, the AYA was disinterested in pursuing behavioral change, the peer coach flexibly aligned with the AYA by acknowledging this, and pausing from the goal setting process:

Peer Coach: "We will take a step back from the goal setting and the coaching process and just like talk a little bit and get to know each other more. This is a low-pressure environment, so I want to get to know you and be able to talk to you..."

Over the remaining five sessions, the AYA and peer coach continued to complete phone calls to check-in. While the AYA remained hesitant to complete the coaching process, the AYA continued to attend sessions regularly with their peer coach during the 3-month coaching interval.

In cases where AYAs expressed an interest in accomplishing non-behavioral change goals, there were some instances in which peer coaches were able to flexibly align with the AYA. In one dyad, via text messaging through the platform, the AYA

indicated a goal not related to behavioral change: to ask the peer coach questions about their experiences living with a COCC (“Would it be ok if I asked you some questions I thought of - about your condition and how it relates to mine, etc. - over text since we don't typically have enough time on our calls?”). After the peer coach agreed, the AYA began asking the peer coach questions about their experience via text message over the course of many months (“Do your friends and family treat you any differently when you were sick?”). The peer coach responded openly about their own experience which prompted the AYA to disclose their own experiences:

AYA: “Do you ever get worried that you will get sick again?”

Peer Coach: “Definitely a little worried. It’s not constant, and I don’t understand it completely, but it does cross my mind sometimes...”

AYA: “I’m sorry that you get worried about that sometimes, but I’m glad to know I’m not the only one!”

After identifying that the AYA desired additional time to connect, the peer coach aligned with the AYA by concluding peer coaching sessions with dedicated time to connect around shared experiences living with a COCC. Following this exchange, a clear improvement was noted in AYA-peer coach rapport.

7.2.5.2 Low Alignment

There were some instances in which peer coaches missed opportunities to effectively identify and align with AYAs who demonstrated ambivalence regarding behavioral change goals. In one dyad, the AYA indicated reluctance to identify an area

of change. In response, the peer coach failed to acknowledge the AYA's reluctance, and rather consistently asked follow-up questions:

Peer Coach: "[What] were some areas that, you know, you felt more stuck or stood out to you in terms of like oh maybe I might wanna work on this, I feel stuck in this right now?"

AYA: "I don't think I felt that way about any of the questions that you asked."

Peer Coach: "Okay. You don't think you felt that way...Um, is there anything, you know, of those things that you really feel like sticks out to you?"

AYA: Um, as of right now, no, just because earlier, or yeah, I stop trying to go and eat so I've just been eating more home-cooked stuff, trying to get, I guess, [a] more balanced diet."

Peer Coach: "Getting a more balanced diet?"

AYA: "Mhmm"

Peer Coach: "You feel like in terms of nutrition you're, you know, on the right path. I know you mentioned that you're eating like more at home, so you feel good about that now?"

AYA: "Mhmm"

Inconsistent with the AYA's stated interests to not work towards behavioral change, the peer coach persistently attempted to direct AYA towards an area of change. After extensive probing by the peer coach, the AYA appeared to reluctantly identify one area to focus on:

Peer Coach: "You feel like, um, maybe rest and relaxation is an area that you want to explore more?"

AYA: "Uh, yeah"

Peer Coach: "Okay, now that, you know through our discussion been able to like pinpoint an area that maybe you would like to dive a little bit deeper into, and of course anytime you want to change this you just let me know. If you really want to focus on something else, that's absolutely fine."

In this example, although the peer coach was able to identify ambivalence, they missed an opportunity to align with the AYA regarding their reluctance to identify a goal.

A total of three AYAs in the sample were lost to follow-up within the three-month interval, and across the three dyads, there were substantive patterns in which the peer coach missed opportunities to align with the AYA.

8. Discussion

Peer support is a developmentally informed approach to support the unique needs of AYAs with a COCC; however, an understanding of the mechanisms that underly peer support interventions remains limited. This study filled a critical gap in the literature by describing the development of the working alliance in a one-to-one peer support intervention for AYAs with a COCC as one possible mechanism.

Findings suggest that trained and supervised young adult peer coaches with a COCC were able to develop a strong alliance in the initial session, which was maintained across subsequent sessions. Findings are consistent with peer support interventions for adults with mental health conditions that suggest peer supporters may hold a unique skill set to facilitate early alliance (Sells et al., 2006; Solomon et al., 1995). These findings are particularly promising for AYAs with a COCC who present with greater risk to disengage from the healthcare system (Heery et al., 2015; Oeffinger et al., 2004; Sheehan et al., 2015; Yeung et al., 2008).

Findings revealed no significant differences in working alliance trajectory across AYA, peer coach, and dyadic characteristics. This suggests that peers with different backgrounds represented in the sample were able to establish a strong early alliance. In

the present study, one unanticipated trend emerged in which dyads with the same COCC had a decrease in alliance over time, while dyads with a different COCC exhibited an increase in alliance over time. This trend suggests that AYA-peer coach dyads with concordant and discordant COCCs may develop a working alliance differently. Further research is needed with a larger sample size to better understand how working alliance may develop among AYAs with concordant and discordant COCCs.

Qualitative findings shed light on peer coach use of skills that may influence the AYA-peer coach relationship trajectory and raise key questions about how peer supporters may uniquely develop a strong early alliance. Two themes emerged that are consistent with other helping relationships (warmth, empathy, and genuineness; alignment with AYA's goals). A third theme, integrating shared experience, is unique to the peer support relationship. In the present study, peer coaches' use of disclosure around similar lived experiences with AYAs was leveraged to build rapport, demonstrate understanding, and validate participants' experiences. These findings are consistent with recent findings from a peer support intervention for adults with depression (Truong et al., 2019). Further examination is necessary to better understand the relationship between peer supporter disclosure and working alliance within peer support modalities for AYAs with a COCC.

8.2 Strengths

This is the first study, to date, that describes working alliance in a peer support intervention for AYAs with a COCC. By leveraging a well-established construct with a rich literature base, working alliance can be used to help inform how peer supporters may build a bond with AYAs to work collaboratively towards behavioral change. A notable strength of this study is that it tested the working alliance in a telephone-based intervention which has implications for scalability. Building upon core findings in youth and adult psychotherapy literature indicating that working alliance is dynamic and changes over time (e.g., Chiu et al., 2009; Kramer et al., 2009; Stiles et al., 2004; Stiles & Goldsmith, 2010), this study used a longitudinal design to describe how the working alliance develops in initial peer support sessions.

Given the nascent nature of the peer support literature with AYAs with a COCC, the present study used multiple methodologies (self-report, qualitative coding) and collected data from multiple raters (AYAs, observers). Lastly, the qualitative analysis approach, including the use of data memos and consensus meetings, was exploratory and allowed for themes to arise that may be unique to the AYA-peer coach relationship and help to inform validated instrument development for this population.

8.3 Limitations

There are several expected limitations to this exploratory study. First, the study is limited by a small sample size. Given insufficient power, trajectory analyses may not

be able to detect statistical differences. Results from the present study should be viewed for descriptive purposes and can be used to guide future research with sufficiently powered samples. Additionally, there was attrition in the current sample across the first four sessions. It should be noted that this is expected when working with AYA patient populations, who are at risk for greater attrition rates in clinical care (Heery et al., 2015; Oeffinger et al., 2004; Sheehan et al., 2015; Yeung et al., 2008). Still, it is possible that AYAs with low alliance may have dropped out prematurely and may not be accounted for in the data. Follow-up studies can focus on identifying AYAs who dropped out prematurely to better understand factors that contribute to drop out, including changes in working alliance.

Secondly, this study is limited by possible ceiling effects. As the majority of AYAs reported a high working alliance following the initial session, any possible improvements in high working alliance may not be adequately detected. It is worth noting that ceiling effects have continued to serve as a core limitation with working alliance self-report working alliance instruments (Shirk et al., 2010), and findings from this study presents with similar challenges. There have been studies indicating other ways to examine working alliance to limit ceiling effects, such as the use of a visual analog scale (Paap et al., 2020). Given expected ceiling effects and limited use of the working alliance measure in peer support settings, authors utilized observer coding to

identify other factors that may influence the AYA-peer coach relationship that may not be currently accounted for with current measurement.

Third, working alliance from the perspective of the peer coach was not examined. In the youth psychotherapy literature, working alliance from the perspective of the therapist has been associated with treatment outcomes (Bickman et al., 2012; Hawley & Garland, 2008; Ormhaug et al., 2015). It is possible that youth may have greater difficulty identifying differences in alliance given fewer experiences with quality relationships compared with their adult counterparts (Bickman et al., 2012). For many AYAs in the sample, this may be one of their first opportunities to obtain support from a peer with a similar illness, which may limit their ability to discriminate high and low alliance. Additional qualitative methodologies, such as conducting qualitative interviews with AYAs to learn about their perspective may provide a more nuanced understanding in how the alliance develops over time.

8.4 Future Directions

Findings from this exploratory study provide direction for future research in peer support interventions for AYAs with a COCC. A recent systematic review examining peer-based support interventions for AYAs with a COCC found a wide range of support modalities (e.g., one-to-one, group, camp, etc.) to target a range of AYA outcomes (e.g., quality of life, physical activity, self-management) (Kohut et al., 2014). Given heterogeneity in peer-based support interventions for AYAs with a COCC,

developing further understanding of the underlying mechanisms remains critical. This study points to working alliance as one well-established and theoretically informed construct that warrants future investigation.

Further examination of working alliance as a possible mediator in peer support interventions for AYAs with a COCC should examine the effects of working alliance on AYA outcomes. While the current study did not evaluate the effects of working alliance on AYA outcomes, working alliance has been associated with a wide range of outcomes in the psychotherapy literature and peer support research points to association between working alliance and outcomes. For example, in a peer support intervention for adults with mental health conditions, working alliance was associated with satisfaction with services, empowerment, and quality of life at one year post enrollment (Thomas & Salzer, 2018). Additionally, in a one-to-one peer support intervention for young adults with eating disorders, greater working alliance with a peer supporter in one session predicted reduced self-rated eating psychopathology in subsequent sessions (Albano et al., 2021). In order to examine the effects of working alliance on outcomes, robust peer support intervention studies with sufficient statistical power are needed.

The present study provides a foundation for future research to examine factors that influence the working alliance trajectory among AYAs with a COCC. Building upon the core tenets of social learning theory and social comparison theory, the degree of one's perceived similarity with another individual impacts how likely one is to model

that behavior (Bandura, 1986; Festinger, 1954). This study extended previous peer support literature by examining the association of concordant characteristics on working alliance. For AYAs who are in the process of forming their identities, concordant characteristics may not be adequately sensitive to the range of intersectional identities that AYAs are exploring. Recent studies suggest that there is variance in the extent to which an AYA's COCC is central to their identity (Cho & Park, 2015; Helgeson & Novak, 2007), which may influence the extent to which they perceive other AYAs with a COCC as similar. Additional work is needed to explore the relationship between perceived similarity and the working alliance trajectory in peer support interventions for AYAs with a COCC.

While further research is needed comparing the development of the working alliance among AYA peers and non-peer professionals, this study suggests that AYA peers may hold a unique skill set in the ability to establish a bond rapidly with a fellow AYA. This preliminary finding offers several opportunities for clinical intervention. As challenges remain in engaging AYAs with a COCC, peer support may provide a cost effective mechanism (Rhee et al., 2012) to engage AYAs in the healthcare system. Indeed, in other clinical populations, peer support has been found to serve as a vehicle to engage hard to reach patients (Sokol & Fisher, 2016). Future clinical programming may consider embedding trained AYA peer supporters on healthcare teams, in which an early strong alliance can be leveraged to promote attendance at follow-up visits. Similarly, deploying

peer supporters in settings where AYAs may congregate, such as college campuses, may be a promising and to increase engagement among AYAs with a COCC who are currently not connected to care.

Finally, ongoing research is needed to examine skills that peer supporters can offer to help build effective working relationships. Qualitative results in this study generate hypotheses about the various peer supporter skills that may influence the peer-to-peer relationship. Data from the present study suggest that peer coaching skills central to the working alliance construct (e.g., warmth, empathy, aligning with AYA's goals) may be consistent in peer support for AYAs with a COCC. Peer supporter's ability to integrate their own experiences may serve as a unique tool that can be leveraged to foster a trusting relationship and provide support. Results from this study can help to inform the development of a valid and standardized measure to evaluate the core factors that underly effective peer-to-peer relationships in interventions for AYAs with a COCC. Such measures can assist in evaluating the competence of AYA peer supporters in building effective working alliances and inform AYA peer supporter training.

8.5 Conclusions

Given the salience of peer influence during the AYA period (Brown, 2013; Brown & Larson, 2009), alongside the heightened influence of similar peers (Bandura, 1986b; Festinger, 1954) and strong interest from patient populations (Rabin et al., 2011; Zebrack,

2008; Zebrack et al., 2006), peer support has been identified as a developmentally appropriate approach to supporting AYAs with a COCC (D'Agostino et al., 2011). However, an understanding of the underlying mechanisms of peer support in this population is limited. This exploratory study described the development of working alliance in a one-to-one peer support intervention for AYAs with a COCC as one possible mechanism.

Findings revealed that AYAs perceived a strong working alliance beginning in the first session, which remained stable across subsequent sessions. Additionally, peers with different backgrounds in the sample were able to establish a strong early working alliance. Qualitative findings indicate core peer coach skills which include both general clinical skills (warmth, empathy, and genuineness; alignment with AYA's goals) as well as skills which are unique to the peer relationship (integration of shared experience). Findings from the present study serve as a foundation for future efforts examining the underlying mechanisms of peer support for AYAs with a COCC.

Appendix A

Trajectory Analysis Results: Association of AYA Characteristics with Overall Working Alliance across Coaching Sessions 1 to 4

Table 9: Trajectory Analyses: AYA Characteristics and Overall Working Alliance Scores

Model	Predictors	F (df, df)	p-value
1	Time	0.65 (1,102)	0.4226
2	Time	0.75 (1,100)	0.3900
	AYA gender	0.01 (1,100)	0.9364
	Time-by-AYA gender	1.63 (1,100)	0.2041
3	Time	0.42 (1,92)	0.5171
	AYA race	0.00 (1,92)	0.9690
	Time-by-AYA race	0.05 (1,92)	0.8323
4	Time	1.06 (1,100)	0.3060
	AYA age	0.00 (1,100)	0.9583
	Time-by-AYA age	0.42 (1,100)	0.5165
5	Time	0.99 (1,100)	0.3211
	AYA education level	0.00 (1,100)	0.9741
	Time-by-AYA education level	0.58 (1,100)	0.4498
6	Time	0.61 (1,98)	0.4353
	AYA COCC category	0.47 (2, 98)	0.2624
	Time-by-AYA COCC category	1.26 (2, 98)	0.2895

Note. Random coefficient regression models (RPMs) for longitudinal data.

Table 10: Trajectory Analyses: AYA Characteristics and Adjusted Working Alliance Overall Scores

Model	Predictor	Session 1 Median (25th, 75th)	Session 2 Median (25th, 75th)	Session 3 Median (25th, 75th)	Session 4 Median (25th, 75th)
1	Time	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)
2	Time	4.5 (4.4, 4.5)	4.6 (4.4, 4.6)	4.7 (4.3, 4.7)	4.8 (4.3, 4.8)
	AYA gender				
	Female	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)	4.8 (4.8, 4.8)
	Male	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)	4.3 (4.3, 4.3)	4.3 (4.3, 4.3)
3	Time	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.5, 4.6)
	AYA race				
	White/Caucasian	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)
	Black/African American	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.6 (4.6, 4.6)
4	Time	4.4 (4.4, 4.5)	4.5 (4.5, 4.6)	4.5 (4.5, 4.7)	4.5 (4.5, 4.8)
	AYA age				
	Age 16 to 18	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)	4.8 (4.8, 4.8)
	Age 19 to 23	4.4 (4.4, 4.4)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)
5	Time	4.4 (4.4, 4.5)	4.4 (4.4, 4.6)	4.5 (4.5, 4.7)	4.5 (4.5, 4.8)
	AYA education level				
	Less than high school	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)	4.8 (4.8, 4.8)
	High school diploma or greater	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)
6	Time	4.5 (4.4, 4.5)	4.5 (4.4, 4.5)	4.5 (4.4, 4.7)	4.5 (4.4, 4.8)
	AYA COCC category				
	Frequent hospitalizations/ED visits	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)
	High daily management with flares	4.4 (4.4, 4.4)	4.5 (4.5, 4.5)	4.7 (4.7, 4.7)	4.8 (4.8, 4.8)
	Survivor of life-threatening condition	4.5 (4.5, 4.5)	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)

Note. Median (25th, 75th) percentile presented due to skewness of +1.0 or greater. Alliance scores adjusted for fixed and random effects in the trajectory model.

Appendix B

Trajectory Analysis Results: Association of Peer Coach Characteristics with Overall Working Alliance across Coaching Sessions 1 to 4

Table 11: Trajectory Analyses: Peer Coach Characteristics and Overall Working Alliance Scores

Model	Predictors	F (df, df)	p-value
1	Time	2.50 (1,100)	0.1171
	Peer coach gender	0.01 (1,100)	0.9364
	Time-by-peer coach gender	1.63 (1,100)	0.2041
2	Time	0.00 (1,79)	0.9959
	Peer coach race	0.18 (1,79)	0.6764
	Time-by-peer coach race	0.18 (1,79)	0.6764
3	Time	0.61 (1,98)	0.4353
	Peer coach condition category	0.47 (2,98)	0.6240
	Time-by-peer coach COCC category	1.26 (2,98)	0.2895

Note. Random coefficient regression models (RPMs) for longitudinal data.

Table 12: Trajectory Analyses: Peer Coach Characteristics and Adjusted Working Alliance Overall Scores

Model	Predictor	Session 1 Median (25th, 75th)	Session 2 Median (25th, 75th)	Session 3 Median (25th, 75th)	Session 4 Median (25th, 75th)
1	Time	4.5 (4.4, 4.5)	4.6 (4.4, 4.5)	4.7 (4.3, 4.7)	4.8 (4.3, 4.8)
2	Peer coach gender				
	Female	4.5 (4.4, 4.5)	4.6 (4.4, 4.6)	4.7 (4.3, 4.7)	4.8 (4.3, 4.8)
	Male	4.5 (4.4, 4.5)	4.4 (4.4, 4.6)	4.7 (4.3, 4.7)	4.8 (4.3, 4.8)
	Time	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.5, 4.6)	4.6 (4.4, 4.6)
3	Peer coach race				
	White/Caucasian	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.6 (4.6, 4.6)
	Black/African American	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.4 (4.4, 4.4)
	Time	4.5 (4.4, 4.5)	4.5 (4.4, 4.5)	4.5 (4.4, 4.7)	4.5 (4.4, 4.8)
4	Peer coach COCC category				
	Frequent Hospitalizations/ED visits	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)
	High daily management with flares	4.4 (4.4, 4.4)	4.5 (4.5, 4.5)	4.7 (4.7, 4.7)	4.8 (4.8, 4.8)
	Survivor of life-threatening condition	4.5 (4.5, 4.5)	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)

Note. Median (25th, 75th) percentile presented due to skewness of +1.0 or greater. Alliance scores adjusted for fixed and random effects in the trajectory model.

Appendix C

Trajectory Analysis Results: Association of AYA-Peer Coach Concordant Characteristics with Overall Working Alliance across Coaching Sessions 1 to 4

Table 13: Trajectory Analyses: AYA-Peer Coach Concordance and Overall Alliance Scores

Model	Predictors	F (df, df)	p-value
1	Time	0.70 (1,100)	0.4036
	Gender concordance	0.02 (1,100)	0.8823
	Time-by-gender concordance	0.61 (1,100)	0.4358
2	Time	0.68 (1,100)	0.4112
	Race concordance	0.00 (1,100)	0.9481
	Time-by-race concordance	0.43 (1,100)	0.5147
3	Time	0.38 (1,100)	0.5379
	Age concordance	0.02 (1,100)	0.8996
	Time-by-age concordance	0.33 (1,100)	0.5643
4	Time	0.00 (1,100)	0.9669
	Primary COCC concordance	0.51 (1,100)	0.4749
	Time-by-primary COCC concordance	3.06 (1,100)	0.0834
5	Time	1.30 (1,98)	0.2565
	Total concordance	0.10 (2,98)	0.9066
	Time-by-total concordance	0.56 (2,98)	0.5710

Note. Random coefficient regression models (RPMs) for longitudinal data.

Table 14: Trajectory Analyses: AYA-Peer Coach Concordance and Adjusted Working Alliance Overall Scores

Model	Predictor	Session 1 Median (25th, 75th)	Session 1 Median (25th, 75th)	Session 1 Median (25th, 75th)	Session 1 Median (25th, 75th)
1	Time	4.4 (4.4, 4.5)	4.5 (4.5, 4.6)	4.5 (4.5, 4.7)	4.5 (4.5, 4.7)
	Gender concordance				
	Discordant gender	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)	4.7 (4.7, 4.7)
	Concordant gender	4.4 (4.4, 4.4)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)
2	Time	4.5 (4.4, 4.5)	4.6 (4.4, 4.6)	4.6 (4.4, 4.6)	4.7 (4.5, 4.7)
	Race concordance				
	Discordant race	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)
	Concordant race	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)	4.5 (4.5, 4.5)
3	Time	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.5, 4.6)	4.7 (4.5, 4.7)
	Age concordance				
	Discordant age	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)
	Concordant age	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)
4	Time	4.5 (4.5, 4.5)	4.5 (4.4, 4.5)	4.6 (4.3, 4.6)	4.7 (4.2, 4.7)
	Primary COCC concordance				
	Discordant primary COCC	4.5 (4.5, 4.5)	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)
	Concordant primary COCC	4.5 (4.5, 4.5)	4.4 (4.4, 4.4)	4.3 (4.3, 4.3)	4.2 (4.2, 4.2)
5	Time	4.4 (4.4, 4.5)	4.4 (4.4, 4.6)	4.4 (4.4, 4.7)	4.4 (4.4, 4.9)
	Total concordance				
	0 concordant characteristics	4.5 (4.5, 4.5)	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)	4.8 (4.8, 4.8)
	1 concordant characteristic	4.6 (4.6, 4.6)	4.7 (4.7, 4.7)	4.8 (4.8, 4.8)	4.9 (4.9, 4.9)
	2 or more concordant characteristics	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)	4.4 (4.4, 4.4)

Note. Median (25th, 75th) percentile) presented due to skewness of +1.0 or greater. Alliance scores adjusted for fixed and random effects in the trajectory model.

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Biography

Samuel Mark Brotkin was born in Oceanside, New York. He attended the University of North Carolina at Chapel Hill. As an undergraduate, he completed his honor's thesis exploring future self-continuity and health behavior under the mentorship of Dr. Paschal Sheeran, graduating with honors in Psychology in 2015.

He matriculated into the Clinical Psychology Doctoral Program at Duke University in 2017, where he worked under the mentorship of Dr. Melanie Bonner and Dr. Gary Maslow focusing on promoting the health and well-being of adolescents and young adults living with childhood onset chronic conditions, with a particular interest in cancer and cancer survivorship. Over the past six years, Sam has helped to co-develop the PiCASO peer coaching intervention, a one-to-one telephone-based peer support intervention for adolescents and young adults living with a childhood onset chronic condition. He received his Master of Arts degree from Duke University in 2017. As a doctoral student, Sam has presented 3 conference presentations, co-authored 14 conference posters, and co-authored 8 peer-reviewed journals and chapters. He will complete an APA-accredited Clinical Psychology Internship with a focus in Pediatric Psychology at the University of Florida Health Science Center in July 2022.