An Examination of Predictors of Quality of Life in Children and Adolescents receiving Mental Health Services

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Abstract

Children with mental health problems have a significantly worse quality of life (QoL) in comparison to typically developing children, or those with physical health conditions. However, research identifying factors associated with QoL in this vulnerable population is quite scarce. To address this gap in the literature, 347 clinically referred children and youth (ages 7-18 years old) were assessed using the interRAI Child and Youth Mental Health Assessment (ChYMH) and Self-report Quality of Life- Child and Youth Mental Health (SQoL-ChYMH). Hierarchical multiple linear regression analyses revealed that after controlling for age, gender, and patient status, children and adolescents with higher depressive symptoms reported lower overall QoL. At the sub-domain level, higher depressive symptoms was associated with lower basic needs and individual QoL; furthermore, higher anhedonia and depressive symptoms were associated with lower social QoL. In contrast, no mental state indicators were associated with QoL pertaining to services (i.e. school and treatment). Clinical implications and intervention strategies are discussed.

Keywords

Children and youth; quality of life; mental state indicators; interRAI
Acknowledgments

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Introduction

Untreated mental illness is associated with grave consequences at both the individual and societal level. At the individual level, the impact of mental illness can be dramatic and far-reaching, affecting relationships, education, and community involvement. Notably, it has been widely reported that quality of life (QoL) is significantly lower in individuals suffering from mental illness compared to the general population (Mendlowicz & Stein 2000; Ishak et al., 2011; Madhav & Buesching, 2001). At the societal level, the 2010 Global Burden of Disease Study reported that mental and behavioural disorders account for 23% of years of life lost due to disability in Canada (Public Health Agency of Canada, 2015). Another recent report examining the economic cost of mental illness in Canada found direct costs (i.e. physician care) to be approximately $8 billion, and indirect costs (i.e. social and judicial services) ranging from $11 to $50 billion per year (Public Health Agency of Canada, March 2014). Therefore, one potential target to reduce the economic burden of mental illness is improving the quality of life in those with mental health issues.

A substantive amount of literature has investigated determinants of quality of life in those with mental illness, and researchers have identified a number of significant clinical, psychosocial, and to a lesser extent demographic factors (e.g., Fleury et al., 2013; Hansson, 2006; Yanos, Rosenfield, & Horwitz, 2001). The purpose of this study is to add to this growing body of research, specifically examining whether mental state indicators predict quality of life in children and adolescents receiving mental health services.
Chapter 1

1 Quality of Life

Quality of life is a latent construct, meaning that it cannot be directly observed or measured. Although there is no standard definition of QoL, it has been widely accepted that it is a multidimensional concept integrating several domains, such as physical, psychological, and social well-being. The World Health Organization (WHO) describes QoL as ‘the individual’s perception of [his or her] position in life, in the context of culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns’ (1993). Others have described QoL as ‘a subjective perception of well-being and satisfaction that can be evaluated by the child according to his/her own experience within several life domains’ (Mattejat & Remschmidt, 1998).

QoL represents one of the key components in describing and evaluating mental health. It has been reported that there is increasing consensus for mental health to be described along three dimensions: 1) psychopathology or clinical symptomology, 2) impact on adaptive functioning and impairment in everyday life, as evaluated by an objective observer, and 3) self-assessment of the impact on an individual’s QoL (Coghill, Danckaerts, Sonuga-Barke, & Sergeant, 2009). Therefore, it falls in line that the goal of mental health treatment is to decrease symptoms, improve functionality, and increase the well-being of the patient. Unfortunately, clinicians have historically limited their evaluation of treatment response to measures of symptomology only, thereby excluding QoL. However, as the healthcare system has begun to realize that the patient’s life experiences and preferences matter, QoL measures have become increasingly utilized
(Sanders, Egger, Donovan, Tallon, Frankel, 1998). Some researchers have even gone so far as to state that no variable is more clinically important or significant than quality of life, as it is a very central aspect of an individual’s everyday functioning and experience (Kazdin, 1993). This notion was further supported by Spitzer and colleagues (1995) who proposed that the main objective of healthcare should be to improve the individual’s subjective well-being or quality of life, above and beyond all other treatment goals.

1.1 Relevance

Quality of life measures are useful for several reasons, one being outcome evaluation, which involves monitoring a patient’s progression over time and determining the impact of a specific intervention (Greenhalgh & Meadows, 1999). QoL measures can help detect physical and psychological problems that might otherwise be overlooked, and screen for those who are at a higher risk for future health problems (Espallargues, Valderas, & Alonso, 2000; Diener, Suh, Lucas, & Smith, 1999). Furthermore, QoL measures assist with treatment planning and case conceptualization and help facilitate greater communication between patients and clinicians (Frisch, 1992).

Quality of life measures also hold great importance particularly within the field of mental health. Valid estimates and reports of subjective QoL are needed to illustrate the real impact of mental disorders and allow for comparisons to be made across a range of health conditions (Jonsson et al., 2017). Several European guidelines for childhood mental disorders stress that QoL should be viewed as an important indicator for quality of service delivery and treatment outcome (e.g. National Institute for Health and Clinical Excellence, 2018). Additionally, QoL is likely to be viewed as more meaningful by the patient compared to psychopathology because it is based on their own subjective
experiences (Jonsson et al., 2017). Finally, and perhaps most importantly, QoL measures give patients a voice in their own healthcare, helping to facilitate shared decision-making between the individual and their healthcare providers (Singh, 2013).

1.2 Predictive Validity

Quality of life measures may also have the potential to predict and identify those at high risk for health problems, relapse, and impaired functioning in various domains, including social relationships, school, and work (Frisch et al., 2005). It has been reported that domain-based life satisfaction and QoL scales significantly predict school performance, willingness to participate in prevention programs, response to treatment, suicide, adolescent substance abuse, as well as aggressive behaviours and peer relationship problems in adolescents (Valois, Zullig, Huebner, & Drane, 2001; Wagner et al., 1990; Miller et al., 1998; Koivumaa-Honkanen, 2001; Gilman & Huebner, 2000). Furthermore, life satisfaction and QoL measures have been shown to predict both somatoform and mental disorders. This is evidenced by the results of a prospective study of 184 randomly selected community volunteers, whereby life satisfaction levels assessed two years earlier significantly predicted the onset of Diagnostic and Statistical Manual ( DSM)–diagnosed depressive, anxiety, and somatoform disorders (Baruffol, Gisle, & Corten, 1995). These findings suggest that low life satisfaction is a major risk factor for psychological disturbance.

1.3 Clinical Utility

Researchers have evaluated the impact of measuring quality of life on a number of clinical factors, such as diagnosis, treatment, patient outcomes, and patient satisfaction.
For example, one review evaluated the impact of providing feedback regarding patient's quality of life, or as they termed ‘perceived health status’, to clinicians (Espallargues et al., 2000). They found that half of the included studies showed significant differences in processes of care when the health care professionals were provided with feedback, with positive effects on diagnosing and health service utilization. Furthermore, the greatest effect was found in studies where feedback focused on the mental health status of the patient; this allowed for more undiagnosed patients to be identified. It is important to note that the provision of feedback did not have an effect on other factors, such as treatment rates (i.e. number of prescriptions and changes in treatment). The authors hypothesize that health care professionals may have difficulty in translating these quality of life measures into specific interventions to improve function. Possible changes or improvements would include simpler measures that are easy to interpret, and availability of real-time feedback during the clinician-patient encounter. Overall, the review suggests that the use of quality of life measures may have a positive role in routine clinical practice when used as a screening tool, especially within the mental health field (Espallargues et al., 2000).

1.4 Importance within Child and Adolescent Populations

The value of obtaining children and adolescents’ self-reports about their quality of life, including their health, functioning, abilities, and emotions, is becoming increasingly recognized in both healthcare and child health research. Children are capable of communicating their health needs and making decisions about their care when given age-appropriate information. There is evidence to show that even children as young as 5 years
old can reliably and validly self-report their quality of life when provided with an instrument that is developmentally appropriate (Varni, Limbers, & Burwinkle, 2007).

Self-reported QoL is incredibly important because research has consistently shown that the level of parent-child agreement on quality of life measures can be quite poor (Sprangers & Aaronson, 1992). For example, there is greater agreement for observable functioning (i.e. physical domain), but less agreement for non-observable functioning (i.e. emotional and social domains) (Eiser & Morse, 2001). In a review by Upton, Lawford, and Eiser (2008), parents of children from clinical samples had a tendency to report lower child QoL compared to the children themselves; this is because parents tend to perceive an illness to have more negative consequences than the child or youth. Another study found that specific psychiatric disorders had variable impact on QoL depending on whether the rater was the child, parent, or clinician, highlighting the discordance between self- and proxy-report (Bastiaansen, Koot, Ferdinand, & Verhulst, 2004). This finding is of clinical importance because by understanding which domains of QoL are affected in a specific psychiatric disorder, as reported by the children themselves, clinicians can then focus on those particular domains during assessment, diagnosis, and treatment planning. Furthermore, researchers have found that the determinants of QoL in children with mental illness can vary quite significantly depending on whether QoL was rated by the child or their parent/clinician (Bastiaansen, Koot, & Ferdinand, 2005). To conclude, the key issue is that an overreliance on parental reports interferes with and impedes a strengths-based approach to care when working with children and adolescents, specifically with mental disorders, by overlooking their resilience and ability to reach their own potential (Patel, Flisher, Hetrick, & McGorry,
Therefore, it is strongly suggested that when possible, a child’s quality of life should be based on self-report.
Chapter 2

2 Quality of Life Measurement

Traditionally, the effectiveness of a treatment has been assessed using objective measures, including symptom reduction, hospitalization, and rate of relapse (Gladis, Gosch, Dishuk, & Crits-Christoph, 1999). However, as healthcare has shifted from a paternalistic approach to one that values the subjective patient experience, quality of life has become increasingly utilized as an outcome measure. This is evident in child psychopathology research, where it has been suggested for measures of pathology to be routinely supplemented by assessments of quality of life (Youngstrom, 2013).

2.1 Overview of QoL Measures

There are a number of different ways QoL has been conceptualized in the literature, resulting in different categorizations. For one, researchers have described four main approaches to quality of life, including objective measures, subjective measures, health-related quality of life (HR-QOL), and health-economic measures (Holloway & Carson, 2002). Objective measures were the first to be developed, and they center around “social indicators”, such as income, employment, housing status, social network, and opportunities for recreation (Holloway & Carson, 2002). Subjective measures were developed as an alternative to objective ones, and take into account the perceptions of the individual, such as a person’s sense of well-being and happiness (Baker & Intagliata, 1982). Importantly, Lehman (1983) found that people with severe mental illness are able to meaningfully report on their subjective QoL. The development of HR-QOL measures came from the understanding that the traditional measures of disease were not adequately
capturing the effects of illness (Muldoon, Barger, Flory, & Manuck, 1998). Lastly, health economic approaches aim to measure health outcomes in a standardized way to allow for comparisons among different “health-status” groups; this resulted in the development of quality- and disability-adjusted life years (QUALYS and DALYS, respectively; Salvador-Carulla, 1997). These measures help facilitate comparison of health gains between different health sectors.

Another way quality of life instruments have been categorized is into two groups, namely generic or disease-specific measures. Generic measures are designed to be more comprehensive; however, they are usually less sensitive to treatment-related changes or certain health conditions. On the contrary, disease-specific measures are designed to be more sensitive as they are able to target areas of particular concern in relation to a specific disorder; however, they do not easily allow for comparisons across health conditions (Coghill et al., 2009). In an overview of QoL instruments in children and adolescents, Solans and colleagues (2008) identified 30 generic and 64 disease-specific instruments, with 51 of them being published between 2001-2005. This highlights that the development of QoL instruments for children and adolescents has been increasing, which suggests that more attention is starting to be given to this particular field.

2.2 Measures for Child and Adolescent Populations

The two most common approaches to QoL measurement in child and adolescent mental health research are subjective and HRQOL. These measures typically include several domains in an attempt to reflect its multidimensional nature; for example, physical, social, and psychological domains. However, while there is general agreement over the major domains that encompass QoL, instruments have subdivided these domains
in many different ways. The result of this is that QoL measures tend to have a different structure from one another, making it difficult to compare them directly (Coghill et al., 2009). This can be illustrated by looking at three of the most popular instruments used in the context of child and adolescent mental health. The first is the Pediatric Quality of Life Questionnaire (PedsQL; Varni & Burwinkle, 2006) which is among the simplest measures, having only 3 core domains (i.e. physical, psychological, social), and no sub-domains. The second is the Child Health Questionnaire (CHQ; Landgraf, Rich, & Rappaport, 2002) which is composed of 11 domains (i.e. physical, general behaviour, bodily pain/discomfort, mental health, etc.) and 7 sub-domains. The third and final instrument is the Child Health Illness Profile (CHIP; Riley et al., 2001), comprising of 5 domains (i.e. comfort, resilience, risk avoidance, etc.) and 12 sub-domains.

2.3 interRAI Self-report Quality of Life Measure (SQoL-ChYMH)

Although the development of QoL instruments for children and adolescent populations has been increasing, the majority of these measures are predominantly for paediatric chronic care. However, interRAI has recently developed a self-report quality of life measure, specifically for children and youth who are receiving mental health services (Stewart et al., in press). interRAI is an international collaborative working to improve the quality of life of vulnerable persons, such as children, through developing a comprehensive assessment system. The self-report measure, named Self-report Quality of Life- Child and Youth Mental Health (SQoL-ChYMH), is one of the newest additions to the interRAI Child and Youth suite of instruments. It is imperative to note that each interRAI instrument undergoes rigorous testing to establish reliability and validity of
items, assessment protocols, outcome measures, quality indicators, and case-mix algorithms.

The SQoL-ChYMH assesses the perception of life satisfaction and well-being of children and adolescents with mental health issues. In line with previous literature on the importance and relevance of QoL tools, the SQoL-ChYMH provides children and youth with a voice, promoting engagement in their own healthcare. The purpose of this self-report survey is to help healthcare professionals identify areas of strengths and need in order to maximize QoL in their young clients.

The development of items on the SQoL-ChYMH was the product of substantive research on protective factors and indicators of positive mental health well-established in the literature. The instrument is composed of four major domains (basic needs, social, individual, and services), which are then further divided into 10 subcategories. Importantly, items included within the instrument were developed in collaboration with clinicians who are experts within the field of child and youth mental health care, as well as piloted for clarity with young people. A more in-depth description of the instrument will be provided in the Method section.
Chapter 3

3 Quality of Life and Mental Health

A substantive amount of research has found that quality of life is significantly lower in individuals suffering from mental illness compared to the general population (Mendlowicz & Stein 2000; Ishak et al., 2011; Madhav & Buesching, 2001). More strikingly, it has been reported that individuals with mental health conditions have worse QoL in comparison to those with chronic medical conditions (Dean et al., 2004). Determinants of quality of life in those with mental illness have also been explored, with a significant number of clinical, psychosocial, and to a lesser extent demographic factors being identified (e.g., Fleury et al., 2013; Hansson, 2006; Yanos, Rosenfield, & Horwitz, 2001). Overall, the literature examining quality of life and mental health has predominantly been conducted in adult populations, although more recently studies have begun to focus on child and adolescent populations as well. The following sections will provide an overview of the relationship between psychopathology and QoL, along with other determinants of quality of life in those with mental health conditions, in both adult and younger populations.

3.1 Overview of QoL in Persons with Mental Health Conditions

QoL has been shown to be reduced in individuals suffering from a range of psychiatric disorders, including depression, anxiety, bipolar disorder, schizophrenia, and others (e.g., Wells et al., 1989; Olatunji, Cisler, & Tolin, 2007; Ishak et al., 2012; Xiang et al., 2012). One study compared QoL in numerous different mental disorders (i.e. mood, anxiety, alcohol, somatoform, and eating disorders), and found that mood
disorders accounted for considerably more of the impairment across all HR-QOL domains, whereas other disorders only affected selected domains (Spitzer et al., 1995). Furthermore, researchers have found that even patients with subthreshold symptom levels reported lower quality of life. This suggests that individuals do not need to be diagnosed with a full psychiatric disorder in order for their QoL to be diminished; rather, experiencing some of the symptoms of the disorder can still have a negative impact on QoL.

There is general consensus among studies that depressed patients have significantly lower QoL, especially because major depressive disorder (MDD) affects various domains that are part of the global assessment of QoL (Demyttenaere, De Fruyt, & Huygens, 2002; Kennedy, Eisfeld, & Cooke, 2001; Berlim & Fleck, 2003). There is also strong evidence to support that the degree of decrement in QoL is proportional to the severity of depressive symptoms (Berlim & Fleck, 2007). Furthermore, subjective QoL has been reported to be worse in those with MDD compared to the general population, several major medical chronic illnesses (i.e. cancer and hypertension), as well as other psychiatric disorders (Ishak et al., 2011; Hansson, 2002). In a longitudinal study, subjective QoL was worse in depressed patients compared to a healthy control group at both baseline and 6-month follow-up, even after controlling for age, gender, family history of mental illness, and other comorbid diagnoses (Pyne et al., 1997). From a health economics standpoint, it has been reported that depressive disorders account for the largest percentage of QUALY loss, at approximately 55% (Saarni et al., 2007). Furthermore, in a selective review of the literature on QoL in severe mental illness, it was reported that although numerous correlates of QoL have been identified, mood state is
consistently the most powerful predictor (Holloway & Carson, 2002). Lastly, a longitudinal study reported that change in QoL at follow-up was predicted by the change in depressive symptoms in a sample of people with chronic mental illness receiving community support (Holloway & Carson, 1999).

Although the relationship between anxiety and quality of life is not as extensively studied compared to other psychiatric disorders, it has been reported that adults with anxiety disorders experience substantial impairments to QoL compared to the general population, regardless of the type of anxiety disorder (Olatunji et al., 2007). For example, in comparison to healthy controls, individuals diagnosed with obsessive-compulsive disorder (OCD), panic disorder, social anxiety disorder, and generalized anxiety disorder (GAD) all report having a lower QoL (Subramaniam et al., 2014; Sherbourne, Wells, & Judd, 1996; Pallanti et al., 2008; Henning, Turk, Mennin, Fresco, & Heimberg, 2007).

Anhedonia is described as either a reduced ability to experience pleasure or a diminished interest in engaging in pleasurable activities. Anhedonia is a core symptom of MDD, with the DSM-5 diagnostic criteria stating the individual must be experiencing five or more of the eight listed symptoms during the same 2-week period and at least one of the symptoms should be either (1) depressed mood or (2) loss of interest or pleasure (i.e. anhedonia) (American Psychiatric Association, 2013). In addition, anhedonia can also be a symptom of other mental health disorders, including personality disorders, substance-related disorders, and psychotic disorders; for example, it is typically referred to as one component of the negative symptoms in schizophrenia (American Psychiatric Association, 2013).
Although research has not explored the relationship between anhedonia and quality of life explicitly, numerous studies have investigated QoL in schizophrenic patients, teasing apart the differential effect of negative and positive symptoms. The literature has consistently shown that negative symptoms have a significant inverse relationship to QoL; however, the relationship between general well-being and positive symptoms is less clear (e.g., Eack & Newhill, 2007, Lambert & Naber, 2004). This is interesting to note because positive psychotic symptoms are traditionally the target of antipsychotic drug treatment, and yet they are not a strong determinant of QoL (Herrman, Hawthorne, & Thomas, 2002). Finally, one study examining QoL in individuals vulnerable to psychosis found that negative symptoms are strongly related to QoL and functioning ability in this population, but the same is not true regarding positive symptoms (Svirskis et al., 2007).

3.1.1 QoL in Children/Adolescents with Mental Health Conditions

Quality of life in childhood mental and behavioural disorders is much less established compared to other fields, such as adult mental health and various childhood somatic diseases (Alonson et al., 2004; Solans et al., 2008: Jonsson et al., 2017). This is despite the finding that children with mental disorders also have lower QoL compared to those with physical disorders (Sawyer et al., 2002). Jonsson and colleagues (2017) conducted a recent review on how childhood mental and behavioural disorders affect QoL. They found that the majority of included studies (30/41) examined QoL in neurodevelopmental disorders, namely attention-deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD), motor disorders, and intellectual disabilities. Overall, poorer QoL was reported in the clinical populations compared to healthy control groups.
Importantly, the authors noted that studies for large diagnostic groups, such as anxiety disorders, depressive disorders, and (early onset) schizophrenia are largely lacking.

One study that examined the relationship between quality of life and depression in youth found that higher levels of depressive symptoms were associated with lower subjective well-being, self-esteem, and psychosocial functioning (Derdikman-Eiron et al., 2011). An inverse relationship between anxiety symptoms and HR-QOL in adolescence has also been reported; for example, Raknes and colleagues (2017) found that anxiety symptoms predicted lower HR-QOL in a community sample of Norwegian adolescents. QoL has also been found to be more strongly associated with internalizing versus externalizing pathology according to both self- and parent-report (Weitkamp, Daniels, Romer, & Wiegand-Grefe, 2013).

A very small subset of studies have compared the impact of various mental disorders on QoL head-to-head. However, a Norwegian group of researchers compared QoL between several mental disorders in a clinical sample and found youth who reported anxiety and depression had a lower QoL compared to the ADHD group (Thaulow, & Jozefiak, 2012). Furthermore, Sawyer and colleagues (2002) compared QoL (parent-reported) in children with MDD, ADHD, or conduct disorder (CD). They reported differences in QoL domains, such that children with depression had more emotional problems, pain, and discomfort; whereas, children with ADHD or CD reported increased behavioural problems. This suggests that while different mental health disorders may impact some QoL domains similarly, the effect on other domains may be disorder-specific.
Although research examining QoL in (early onset) schizophrenia is lacking, there are a small number of studies that have investigated QoL in pediatric bipolar disorder. Bipolar disorder (BPD) is characterized by periods of elevation in mood, energy, activity, anger, and grandiosity, which may or may not be paired with periods of major depression (American Psychiatric Association, 2013). Due to the fact that there are some similarities between the manic/hypomanic and depressive states of BPD and positive and negative symptoms of schizophrenia, respectively, differentiating between these two mental disorders can sometimes be difficult. However, the key distinction is that schizophrenia is a primary psychotic disorder, and BPD is a primary mood disorder that may or may not also involve psychosis. One study examining QoL in pediatric BPD found adolescents with BPD had significantly lower QoL scores compared to those with behaviour disorders, as well as non-mood and non-behaviour psychiatric diagnoses (Freeman et al., 2009). Furthermore, depressive symptoms showed the strongest effect on QoL in terms of raw correlation and also after adjusting for a number of covariates.

As Jonsson and colleagues (2017) reported, numerous studies have evaluated QoL in children and adolescents with ADHD. Interestingly, despite ADHD being more extensively studied compared to other mental disorders in youth, the literature provides some conflicting findings (Danckaerts et al., 2010). Mainly, there is a strong negative correlation between ADHD and parent-reported QoL; however, there is a much weaker, and sometimes non-existent relationship when QoL is reported by the child him/herself. In a systematic review, Danckaerts and colleagues found (2010) that children with ADHD rated their own QoL less negatively compared to their parents, and do not always see themselves as functioning less well than healthy controls. The authors suggest that
parents may rate their child’s QoL as worse than the child him/herself because either the child is minimizing their difficulties/may lack self-awareness, or more interestingly, the parents’ ratings are impacted by their own burden of care. These findings highlight the parent-proxy problem within QoL research in younger populations.

Mental health disorders interact in complex ways with quality of life in children and adolescents, and future research should be aimed at investigating these interactions further. Moreover, the aforementioned review by Jonsson and colleagues (2017) has outlined several specific gaps in the literature on quality of life in youth with mental and behavioural disorders. Firstly, as previously noted, most studies focus on single disorders as opposed to comparing disorders head-to-head. More research comparing disorders to one another would help establish both the specificity and universality of QoL findings. Jonsson and colleagues (2017) note, “the lack of more informative QoL domain profile research is disappointing, as QoL is a multidimensional construct, which theoretically seems illogical to be expressed in form of a single score”. Therefore, they conclude that future research should aim to determine the extent that diagnostic groups show specific patterns of QoL challenges. Secondly, comorbid conditions are seldom reported, with studies either excluding children with comorbidity or simply not measuring it. Lastly, the literature typically fails to analyze the association between symptom severity and impairment with level of QoL. Therefore, one line of future research could examine how self-reported QoL can be affected by mental states, such as depression and anxiety.
3.2 Other Determinants of QoL in Persons with Mental Health Conditions

The previous section provided an in-depth review of the relationship between QoL and clinical variables, including psychopathology and symptom severity; alternatively, this next section will discuss other determinants of QoL that are important to consider in those with mental illness.

In a review on predictors of QoL in people with severe mental illness, Hansson (2006) categorized the determinants into four key groups: sociodemographic characteristics, personality factors/self-related constructs, social support, and mental health services. Sociodemographic characteristics, including gender and age, have a weak or non-existent relationship to well-being, as they explain only a relatively small part of the variance in QoL scores (Holloway & Carson, 2002). Moreover, clinical variables have been shown to be more significantly correlated to QoL compared to demographic variables (Masthoff, Trompenaars, van Heck, Hodiamont, & de Vries, 2006). Therefore, it has been suggested that further research should be aimed at investigating the relationships between QoL and other variables, such as psychopathology, in order for QoL to be used as an efficient outcome measure in research, clinical practice, and policy-making.

A number of self-related traits have also been suggested to be important predictors of QoL in those with mental health issues, such as autonomy, self-efficacy, and mastery (Hansson, 2006). Other predictors of QoL include temperament, positive self-concept, and hope (Hansson, Eklund, & Bengtsson-Tops, 2001; Zissi, Barry, & Cochrane, 1998; Landeen, Pawlick, Woodside, Kirkpatrick, & Byrne, 2000).
Furthermore, a study examining personality traits in persons with schizophrenia or schizoaffective disorder found that subjective QoL was negatively correlated to neuroticism, and positively correlated to agreeableness and extroversion (Kentros, Terkelsen, Hull, Smith, & Goodman, 1997).

One of the major determinants of QoL, notwithstanding clinical variables, is social support and/or social network (Hansson, 2006). It has been consistently reported that lack of social support decreases QoL in those with mental illness (Lam & Rosenheck, 2000). Furthermore, there is also a strong association between negative social interaction and lower QoL, especially if the interaction is perceived as stigmatizing (Yanos et al., 2001). Finally, a study examining factors associated with subjective QoL in people with severe mental illness over a 6-year time period found that a larger social network, in addition to a reduction in symptoms, was associated with a better QoL longitudinally (Hansson & Björkman, 2007).

With respect to mental health services, patients in hospital settings report having a lower QoL compared to patients in community care settings; moreover, QoL increases as patients move from inpatient settings to community care (Hansson, 2006). A cross-sectional study explored the association between QoL and leadership style of the mental health team and found a laissez faire style of leadership was linked to lower QoL among their patients (Corrigan & Buican, 1995). Additionally, McCabe and colleagues (1999) found the association between QoL and the therapeutic relationship was only significant for long-term patients, not first-admission patients. This highlights the increasing importance of therapeutic relationships as the patient’s care progresses over the course of their treatment.
Finally, a longitudinal study on predictors of QoL in those with severe mental disorders found that past negative life events (such as, being a victim of a crime or repeated suicide attempts), along with unmet needs and poor housing quality were associated with a lower QoL (Fleury et al., 2013). Overall, research has identified a number of determinants of QoL in those suffering from mental illness above and beyond clinical variables, including personality factors/self-related constructs, social support, mental health services, and to a lesser extent, sociodemographic characteristics.

3.2.1 Other Determinants of QoL in Children/Adolescents with Mental Health Conditions

The literature on other determinants of QoL in youth with mental health conditions is substantially less than what has been described in adult populations. However, one study sought to investigate factors that, in addition to childhood psychopathology, are associated with QoL in youth with psychiatric problems (Bastiaansen et al., 2005). The authors identified potential factors using the Bronfenbrenner model, thereby including child, parent, and family/social network characteristics into their predictive model.

Child factors that were significantly associated with QoL were low self-esteem, chronic physical disease, and poor social skills (Bastiaansen et al., 2005). Intelligence was not found to be predictive of QoL in this population. In regard to parent factors, children who had mothers with more psychopathology and/or mothers who experienced more parenting stress reported lower QoL; however, when child psychopathology was included in the model, these factors were no longer significant (Bastiaansen et al., 2005). Lastly, a number of family/social network characteristics were associated with a lower
QoL, including poor family functioning, poor social support, and stressful life events. Surprising to the authors, socioeconomic status (SES) did not impact QoL beyond its effect on psychopathology. Moreover, poor QoL was not linked to family composition, such as living in a one-parent family household (Bastiaansen et al., 2005). Therefore, the overall findings were that several child and family/social network factors were associated with QoL after controlling for psychopathology; however, the influence of parent factors was negligible.
Current Study

Quality of life has been described as ‘the individual’s perception of [his or her] position in life, in the context of culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns’, according to the World Health Organization (WHO; 1993). Importantly, as the healthcare system has evolved to adopt a more client-centered approach that values the subjective patient experience, quality of life has become increasingly utilized as an outcome measure (Sanders et al., 1998). These measures have proven to be incredibly valuable, as they have the potential to predict and identify those at high risk for health problems and relapse, as well as helping to determine the efficacy of a specific intervention (i.e. outcome evaluation) (Frisch et al., 2005; Greenhalgh & Meadows, 1999). Furthermore, QoL measures within child and adolescent populations are particularly informative because research has consistently shown that the level of parent-child agreement on these measures is quite poor (Sprangers & Aaronson, 1992). Therefore, it is of critical importance to include self-report QoL measures in clinical practice, providing children and youth with a voice in their own healthcare decisions. Unfortunately, the majority of QoL instruments developed for child and adolescent populations are predominantly for paediatric chronic care. However, interRAI has recently developed a self-report quality of life measure, specifically for children and youth who are receiving mental health services (Stewart et al., in press).

Extensive research has found significant associations between psychopathologies, including depression and anxiety, and QoL (Wells et al., 1989; Olatunji, Cisler, & Tolin, 2007). Moreover, symptom severity has also been linked to level of QoL in those
suffering from mental illness (e.g., Berlim & Fleck, 2007). The majority of these studies have been conducted in adult populations, although an increasing number are starting to focus on child and adolescent populations; for example, Jonsson and colleagues (2017) conducted a recent review of QoL in children’s mental health. Within their discussion of how certain mental health disorders impact QoL, they also pointed to a number of gaps in the current literature, such as a lack of research comparing disorders head-to-head, a lack of more informative QoL domain profile research, and finally, the literature typically fails to analyze the association between symptom severity and impairment with level of QoL.

The current study intends to close some of these gaps in the literature by investigating the association between symptom severity for a number of mental state indicators, and QoL, measured at both the overall and domain-specific level. The purpose of my study is to determine whether mental state indicators, including depressive symptoms, anxiety, hyperactivity/distractibility, positive symptoms, and anhedonia predicts self-reported quality of life in children and adolescents receiving mental health services (after controlling for age, gender, and patient status); and whether the predictive ability of these factors is stronger for a specific domain(s) of quality of life. The significance of the current study is that it is the first, to our knowledge, to include such a breadth of clinical factors (namely the five mental state indicators) in a comprehensive multivariate analysis examining determinants of QoL. Finally, it is important to note that we made the decision to include mental state indicators, or symptomology, as the predictor variables within our model as opposed to full psychiatric diagnoses because research has shown that even subthreshold levels of symptomology can have severe negative consequences on an individual’s quality of life.
Considering the previous literature, it was hypothesized that depressive symptoms would be the strongest predictor of overall QoL since substantive research has shown a strong relationship between these two variables. No further hypotheses were made regarding the remaining predictor variables because this was the first study to include all these factors within the same multivariate model, and so was somewhat exploratory by nature.
Method

Participants

A convenience sample of 347 clinically referred children and youth who have accessed services from a tertiary mental health centre in the Province of Ontario over a three-year period participated in this study. The interRAI Child and Youth Mental Health Assessment (ChYMH; Stewart et al., 2015) and SQoL-ChYMH (Stewart et al., in press) were administered as part of typical clinical practice upon accessing mental health services at the tertiary mental health centre. Both male (72.3%) and female (27.7%), as well as inpatient (25.9%) and outpatient (74.1%), children and youth ranging in age from 7-18 years old ($M= 10.89$, $SD= 2.76$) were included in this study. Furthermore, only English-speaking children and adolescents who completed both the interRAI ChYMH and the SQoL-ChYMH were included in the current study. Youth with developmental disabilities were excluded from this study. There were no direct benefits to participants in this study and health care was not affected.

Measures

The *interRAI Child and Youth Mental Health Assessment* (ChYMH; Stewart et al., 2015). The interRAI ChYMH is a comprehensive mental health needs assessment. It is comprised of approximately 400 clinical elements that are used to assess psychiatric, social, environmental, and medical issues for school-age children between 4-18 years. A number of scales are embedded in the instrument that can be used for outcome measurement. Furthermore, the ChYMH also contains collaborative action plans (CAPs), which are specific care planning guidelines based on evidence-informed practice. These
CAPs are triggered based on areas of risk identified through the assessment. The instrument is based on a semi-structured interview format that intends to collect both qualitative and quantitative information. Clinicians complete the ChYMH using all available sources of information, such as speaking directly to the child or youth and their family, speaking to other service providers (i.e. school and healthcare professionals), and reviewing previous records.

The *Self-report Quality of Life- Child and Youth Mental Health* (SQoL-ChYMH; Stewart et al., in press). The SQoL-ChYMH is a self-report survey that is intended to assess the subjective well-being and satisfaction of children and youth 7-18 years, receiving mental health services. The pre-service questionnaire contains 33 items that were developed based on protective factors and indicators of positive mental health well-established in the literature, including: basic needs (living conditions, food, safety and privacy), social (friends and activities, respect from others, family), individual (autonomy, health), and services (school, treatment). The child or youth is asked to rate how true each statement is for him or her based on a three-point scale. Notably, the SQoL-ChYMH has been recommended as “Leading Practice” by Accreditation Canada.

The interRAI suite of instruments has been designed by an international team of knowledgeable researchers and clinicians for the purpose of assisting vulnerable populations and improving their quality of life. Rigorous reliability and validity studies have demonstrated strong psychometric properties across the family of assessment tools targeting various populations, including adults (Morris et al., 1997; Burrows, Morris, Simon, Hirdes, & Phillips, 2000; Morris, Carpenter, Berg, & Jones, 2000; Hirdes et al., 2002; Hirdes et al., 2008), as well as children and youth (Lau, Stewart, Saklofske,
Several scales that have been developed based on items from the interRAI ChYMH, along with all items comprised in the SQoL-ChYMH, were included in the current study to investigate the relationship between mental state indicators and QoL in children and adolescents.

**Demographics.** Demographic information, including variables such as the child or youth’s sex and age, was obtained from both the ChYMH and SQoL-ChYMH assessments.

**Patient status.** The status of the child or youth as either an inpatient or outpatient was also obtained from both the ChYMH and SQoL-ChYMH assessments.

**Depressive symptoms.** Depressive symptoms were measured using the *Depressive Severity Index* (DSI), which measures the frequency of the indicators of depression. Examples of these indicators include sad facial expressions, negative statements, self-deprecation, and feelings of hopelessness. DSI scores were determined by summing five items, rated on a scale from 0-4 (0 = Not present, to 4 = Exhibited daily in last 3 days, 3 or more episodes or continuously); scores of “4” were subsequently recoded to “3”. Therefore, scores on the DSI range from 0-15, where higher scores are indicative of more severe depressive symptoms.

**Anxiety symptoms.** Anxiety symptoms were measured using the *Anxiety Scale*, which measures the frequency of the symptoms of anxiety. Examples of these symptoms include obsessive thoughts, unrealistic fears, episodes of panic, and nightmares. Anxiety
scores were determined by summing seven items, rated on a scale from 0-4 (0 = Not present, to 4 = Exhibited daily in last 3 days, 3 or more episodes or continuously). Scores on the Anxiety Scale range from 0-28, where higher scores are indicative of more severe anxiety symptoms.

Hyperactivity and distractibility. Hyperactive and distractive behaviour was measured using the Hyperactivity-Distractibility Scale, which measures the frequency of hyperactivity and distractibility. Examples of these types of behaviour include being impulsive, having an excessive level of activity, and having difficulty paying attention. Hyperactivity and distractibility scores were determined by summing 4 items rated on a scale from 0-4 (0 = Not present, to 4 = Exhibited daily in last 3 days, 3 or more episodes or continuously). Scores on the Hyperactivity-Distractibility Scale range from 0-16, where higher scores indicate greater frequency and diversity of disruptive behaviours.

Positive symptoms. Positive symptoms were measured using the Positive Symptoms Scale, which measures the frequency of positive symptoms of psychosis. Examples of these symptoms include hallucinations, delusions, and abnormal thought processes. Positive symptoms scores were determined by summing 4 items rated on a scale from 0-4 (0 = Not present, to 4 = Exhibited daily in last 3 days, 3 or more episodes or continuously); scores of “4” were subsequently recoded to “3”. Therefore, scores on the Positive Symptoms Scale range from 0-12, where higher scores indicate higher levels of positive symptoms.

Anhedonia symptoms. Anhedonia symptoms were measured using the Social Disengagement Scale, which measures the frequency of symptoms related to anhedonia.
Examples of these symptoms include lack of interest in social interaction, expressions of a lack of pleasure in life, and lack of motivation. Anhedonia scores were determined by summing 4 items rated on a scale from 0-4 (0 = Not present, to 4 = Exhibited daily in last 3 days, 3 or more episodes or continuously). Scores on the Social Disengagement Scale range from 0-16, where higher scores indicate higher levels of anhedonia.

**Overall quality of life.** Overall quality of life was measured using the SQoL-ChYMH, which measures the level of endorsement by the child or youth on a number of items related to quality of life (i.e. basic needs, social, individual, and services). Examples of these items include “I get along with other kids”, “I have enough to eat”, and “I have choices in how to spend my time”. An overall quality of life score was calculated for each participant by summing the 33 items of the SQoL-ChYMH, rated on a scale from 0-2 (0 = Never true, 1 = Sometimes true, and 2 = Very or often true). Scores range from 0-66, where higher scores are indicative of higher quality of life. Raw scores were converted to z-scores for the purpose of comparative analyses.

**Domain-specific quality of life.** Domain-specific quality of life was also measured using the SQoL-ChYMH, measuring the same constructs as mentioned above and using the same scale. However, here, four domain-specific scores were calculated for each participant by summing the number of items on the SQoL-ChYMH pertaining to each domain. The four scores reflect quality of life in relation to basic needs (8 items, scores range from 0-16), social (13 items, scores range from 0-26), individual (7 items, scores range from 0-14), and services (5 items, scores range from 0-10). Similar to the overall quality of life score, higher scores are indicative of higher quality of life within
that domain. Raw scores were converted to z-scores for the purpose of comparative analyses.

Procedure

Data collection using the interRAI ChYMH and SQoL-ChYMH instruments was approved by the University ethics board (REB #106415); furthermore, linking data between the interRAI ChYMH and SQoL-ChYMH was also approved by the University ethics board (REB # 112885). Data collection has been carried out by trained assessors at a tertiary mental health centre in the Province of Ontario. ChYMH and SQoL-ChYMH data collected from patients are stored at a partner University, on the interRAI Canada secure server (VPN protected with similar security measures as the Canadian Institute of Health Information). Due to the fact that each individual participant is randomly assigned a study-specific participant ID number (or Case Record Number; CRN), no personal identifiers were collected or stored on this secure server. The de-identified data was provided to the lead interRAI developer and stored on a password protected computer in the primary investigator’s locked laboratory at Western University. It is important to note that the computer the data was stored on is standalone, meaning it has no access to internet and no usable USB ports.

Data collected over a three-year period was examined in this study. The ChYMH assessments were completed by trained assessors using a semi-structured interview format. Information was collected from multiple sources, including the child or youth, family members, and other service providers with appropriate consents (i.e. teachers, healthcare professionals). Furthermore, assessors also reviewed the child or youth’s school and medical records when pertinent. The instrument takes approximately 60-90
minutes to complete, depending on case complexity. It is important to note that all assessors completed a two-and-a-half-day training program on the administration of the interRAI ChYMH; they were also required to have a diploma or degree in the mental health field and have at least two years of clinical experience with children and youth.

The SQoL-ChYMH assessments were completed by the child or youth receiving mental health services from a tertiary mental health center, at the same time the ChYMH was completed. The questionnaire takes approximately 15 minutes to complete and is accessible at a grade 2 literacy level. Although three versions of the SQoL-ChYMH are available, including Pre-Service, Post-Service Outpatient, and Post-Service In-patient, only the Pre-Service version was used for this study.

Plan for Analysis

First, frequency and descriptive analyses were conducted for all variables. Second, Spearman’s correlation and Mann-Whitney U tests were conducted, as appropriate, to assess bivariate relationships between each predictor or control variable and overall and domain-specific QoL. Next, the association between overall quality of life and predictor variables (namely, depressive symptoms, anxiety, hyperactivity/distractibility, positive symptoms, and anhedonia - after controlling for age, gender, and patient status) was examined using a hierarchical stepwise multiple linear regression analysis. The first step included the controlled variables- gender, age, and patient status; the second step included the predictor variables of interest, namely the five mental state indicators- depressive symptoms, anxiety, hyperactivity/distractibility, positive symptoms, and anhedonia. Lastly, the association between each domain of quality of life (basic needs, social, individual, and services), and predictor variables
(depressive symptoms, anxiety, hyperactivity/distractibility, positive symptoms, and anhedonia - controlling for age, gender, and patient status) was examined using hierarchical stepwise multiple linear regression analyses. Again, the first step in each of the analyses included gender, age, and patient status; the second step included the five mental state indicators - depressive symptoms, anxiety, hyperactivity/distractibility, positive symptoms, and anhedonia. Assumptions testing were conducted for each analysis to control for threats to statistical conclusions, and all analyses were performed using SPSS Statistics Version 25 software (SPSS Inc., Chicago, IL, USA).

Prior to running the analyses, several univariate outliers were detected for each of the five dependent variables (−3.29>z>3.29, p<0.001). These outliers were subsequently trimmed to z-scores within the acceptable range, and analyses were run with both the original and adjusted data. The outcomes showed no differences, and so it was decided to report results of the analyses including outliers. Furthermore, not all variables were normally distributed; however, bootstrapping did not improve normality, and so the original distributions were used.
Results

Preliminary Analyses

In the present study, the average overall QoL score was 49.71 (SD= 9.28); the average domain-specific QoL scores for basic needs, social, individual, and services was 13.36 (SD= 2.39), 19.44 (SD= 4.05), 9.88 (SD= 2.87), and 7.06 (SD= 2.19), respectively. Further, the average score on the DSI was 6.05 (SD= 4.05); the Anxiety Scale was 7.50 (SD= 5.32), the Hyperactivity-Distractibility scale was 10.42 (SD= 4.63); the Social Disengagement Scale was 3.51 (SD= 3.55); and the Positive Symptoms scale was .90 (SD= 1.93).

Mann-Whitney $U$ tests examining gender differences in overall and domain-specific QoL revealed no statistically significant differences between males and females, except on the individual QoL sub-domain, $U(293) = 10,125.50, p = .012$. Here, males reported significantly higher individual QoL scores compared to females. Mann-Whitney $U$ tests examining differences in QoL scores based on patient status (i.e. inpatient vs. outpatient) found no differences in scores between inpatients and outpatients for overall QoL or the individual or services QoL sub-domains; however, statistically significant differences were found for basic needs [$U(335) = 8,875.00, p = .036$], and social [$U(321) = 8,361.50, p = .037$] QoL sub-domains. Outpatients reported significantly higher QoL scores pertaining to their basic needs (i.e. food and safety) and social relationships (i.e. friends and family) compared to inpatients.

Examining the bivariate relationship between age and QoL, Spearman’s $r$ revealed a significant negative correlation between age and individual QoL ($r = -.169, p$
no significant correlations were found between age and overall, basic needs, social, and services QoL. Examining the bivariate relationship between depressive symptoms and QoL, Spearman’s $r$ revealed a significant negative correlation between depressive symptoms and overall ($r = -0.187, p = .003$), basic needs ($r = -0.115, p = .035$), social ($r = -0.150, p = .007$), and individual QoL ($r = -0.254, p = .000$); no significant correlation was found between depressive symptoms and services QoL. Examining the bivariate relationship between anxiety symptoms and QoL, Spearman’s $r$ revealed a significant negative correlation between anxiety symptoms and overall ($r = -0.161, p = .015$), basic needs ($r = -0.115, p = .044$), social ($r = -0.137, p = .019$), and individual QoL ($r = -0.198, p = .001$); no significant correlation was found between anxiety symptoms and services QoL. Examining the bivariate relationship between anhedonia and QoL, Spearman’s $r$ revealed a significant negative correlation between anhedonia and overall ($r = -0.228, p = .000$), social ($r = -0.240, p = .000$), individual ($r = -0.279, p = .000$), and services QoL ($r = -0.119, p = .050$); no significant correlation was found between anhedonia and basic needs QoL. Further, Spearman’s $r$ revealed no significant correlations between hyperactive/distractive behaviours and overall or domain-specific QoL. Finally, Spearman’s $r$ also revealed no significant correlations between positive symptoms and overall or domain-specific QoL.

**Primary Analyses**

A hierarchical stepwise multiple linear regression analysis was used to predict overall QoL from depressive symptoms, anxiety symptoms, anhedonia, hyperactivity/distractibility, and positive symptoms, after controlling for age, gender, and patient status. The only factor that made a significant contribution, thus was included in the final model
was depressive symptoms. Results indicated that higher levels of depressive symptoms predicted lower self-reported overall QoL ($\beta = -0.231, t = -3.524, p = .001$). The final model explained 4.5% of the variance ($p = .007$). Table 1 presents the results for the model including the regression coefficients, t-statistics, p-values, 95% confidence intervals, and R-squared values (i.e. model fit).

Table 1.

Regression Analysis: Overall Quality of Life

<table>
<thead>
<tr>
<th>Model</th>
<th>$B$ ($SE$)</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>95% CI for $B$</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
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<td>.004</td>
<td>.009</td>
<td>.565</td>
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<tr>
<td>Gender</td>
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<td>.048</td>
<td>.717</td>
<td>.474</td>
<td>[-.176, .378]</td>
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<td>Patient Status</td>
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<td>-.028</td>
<td>-.420</td>
<td>.675</td>
<td>[-.355, .230]</td>
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<tr>
<td>Step 2</td>
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<td></td>
<td></td>
<td></td>
<td>.045</td>
<td>.053</td>
<td>.007</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<td>.707</td>
<td>.480</td>
<td>[-.173, .367]</td>
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<td>Depressive</td>
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<td>-.231</td>
<td>-3.524</td>
<td>.001</td>
<td>[-.087, -.025]</td>
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</table>

A hierarchical stepwise multiple linear regression analysis was used to predict basic needs QoL from depressive symptoms, anxiety symptoms, anhedonia, hyperactivity/distractibility, and positive symptoms, after controlling for age, gender, and patient status. The only factor that made a significant contribution, thus was included in the final model was depressive symptoms. Results indicated that higher levels of
depressive symptoms predicted lower self-reported basic needs QoL ($\beta = -0.143, t = -2.509, p = .013$). The final model explained 2.9% of the variance ($p = .011$). Table 2 presents the results for the model including the regression coefficients, t-statistics, p-values, 95% confidence intervals, and R-squared values (i.e. model fit).

Table 2.

Regression Analysis: Basic Needs Quality of Life

<table>
<thead>
<tr>
<th>Model</th>
<th>B (SE)</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>95% CI for B</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Step 1</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<td>-.009</td>
<td>-.156</td>
<td>.876</td>
<td>[-.267, .228]</td>
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<tr>
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<td>.083</td>
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<td>[-.011, .070]</td>
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<td>.020</td>
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<td></td>
</tr>
<tr>
<td>Step 2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.026 (.125)</td>
<td>-.012</td>
<td>-.209</td>
<td>.835</td>
<td>[-.272, .220]</td>
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<tr>
<td>Age</td>
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<td>.092</td>
<td>1.608</td>
<td>.109</td>
<td>[.007, .073]</td>
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<tr>
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<td>[.539, -.007]</td>
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<tr>
<td>Depressive</td>
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<td>-.143</td>
<td>-2.509</td>
<td>.013</td>
<td>[.065, -.008]</td>
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</table>

A hierarchical stepwise multiple linear regression analysis was used to predict social QoL from depressive symptoms, anxiety symptoms, anhedonia, hyperactivity/distractibility, and positive symptoms, after controlling for age, gender, and patient status. Two factors made a significant contribution, namely anhedonia and depressive symptoms, thus were both included in the final model. Results indicated that higher levels of anhedonia ($\beta = -0.145, t = -2.274, p = .024$) and depressive symptoms ($\beta = -0.122,
t = -2.006, p = .046) predicted lower self-reported social QoL. The final model explained 5.6% of the variance (p = .001). Table 3 presents the results for the model including the regression coefficients, t-statistics, p-values, 95% confidence intervals, and R-squared values (i.e. model fit).

Table 3.

Regression Analysis: Social Quality of Life

<table>
<thead>
<tr>
<th>Model</th>
<th>B (SE)</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>95% CI for B</th>
<th>R²</th>
<th>ΔR²</th>
<th>p</th>
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</thead>
<tbody>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Gender</td>
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<td>.062</td>
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<td>.293</td>
<td>[-.112, .369]</td>
<td>.017</td>
<td>.027</td>
<td>.046</td>
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<tr>
<td>Age</td>
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<td>.073</td>
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<td>Patient Status</td>
<td>-.201 (.132)</td>
<td>-.090</td>
<td>-1.527</td>
<td>.128</td>
<td>[-.460, .058]</td>
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<tr>
<td>Step 2</td>
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<td></td>
<td></td>
<td></td>
<td>.046</td>
<td>.031</td>
<td>.002</td>
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<tr>
<td>Gender</td>
<td>.110 (.120)</td>
<td>.053</td>
<td>.916</td>
<td>.361</td>
<td>[-.127, .347]</td>
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<td>Age</td>
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<td>-.049</td>
<td>-0.795</td>
<td>.427</td>
<td>[-.057, .024]</td>
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<td>Patient Status</td>
<td>-.223 (.130)</td>
<td>-.100</td>
<td>-1.716</td>
<td>.087</td>
<td>[-.479, .033]</td>
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<td>Anhedonia</td>
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<td>-.186</td>
<td>-3.082</td>
<td>.002</td>
<td>[-.083, -.018]</td>
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<td>.056</td>
<td>.013</td>
<td>.001</td>
</tr>
<tr>
<td>Gender</td>
<td>.107 (.120)</td>
<td>.051</td>
<td>.892</td>
<td>.373</td>
<td>[-.129, .343]</td>
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<td></td>
<td></td>
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<tr>
<td>Age</td>
<td>-.018 (.021)</td>
<td>-.054</td>
<td>-.889</td>
<td>.375</td>
<td>[-.059, .022]</td>
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</tr>
<tr>
<td>Patient Status</td>
<td>-.187 (.131)</td>
<td>-.084</td>
<td>-1.435</td>
<td>.152</td>
<td>[-.444, .070]</td>
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<tr>
<td>Anhedonia</td>
<td>-.039 (.017)</td>
<td>-.145</td>
<td>-2.274</td>
<td>.024</td>
<td>[-.073, -.005]</td>
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<tr>
<td>Depressive Symptoms</td>
<td>-.030 (.015)</td>
<td>-.122</td>
<td>-2.006</td>
<td>.046</td>
<td>[.059, -.001]</td>
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A hierarchical stepwise multiple linear regression analysis was used to predict individual QoL from depressive symptoms, anxiety symptoms, anhedonia, hyperactivity/distractibility, and positive symptoms, after controlling for age, gender, and patient status. The only factor that made a significant contribution, thus was included in the final model was depressive symptoms. Results indicated that higher levels of depressive symptoms predicted lower self-reported individual QoL ($\beta = -.302$, $t = -5.240$, $p = .000$). The final model explained 13.9% of the variance ($p = .000$). Table 4 presents the results for the model including the regression coefficients, t-statistics, p-values, 95% confidence intervals, and R-squared values (i.e. model fit).

Table 4.

Regression Analysis: Individual Quality of Life

<table>
<thead>
<tr>
<th>Model</th>
<th>B (SE)</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>95% CI for B</th>
<th>$R^2$</th>
<th>$\Delta R^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
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<td></td>
<td></td>
<td></td>
<td>.051</td>
<td>.062</td>
<td>.001</td>
</tr>
<tr>
<td>Gender</td>
<td>.301 (.129)</td>
<td>.141</td>
<td>2.329</td>
<td>.021</td>
<td>[.046, .555]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.064 (.021)</td>
<td>-.187</td>
<td>-3.065</td>
<td>.002</td>
<td>[-.105, -.023]</td>
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<tr>
<td>Patient Status</td>
<td>-.063 (.135)</td>
<td>-.028</td>
<td>-.467</td>
<td>.641</td>
<td>[-.328, .202]</td>
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<td>Step 2</td>
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<td></td>
<td></td>
<td></td>
<td>.139</td>
<td>.090</td>
<td>.000</td>
</tr>
<tr>
<td>Gender</td>
<td>.268 (.123)</td>
<td>.126</td>
<td>2.181</td>
<td>.030</td>
<td>[.026, .511]</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.063 (.020)</td>
<td>-.184</td>
<td>-3.167</td>
<td>.002</td>
<td>[-.102, -.024]</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Patient Status</td>
<td>-.003 (.129)</td>
<td>-.001</td>
<td>-.022</td>
<td>.982</td>
<td>[.256, .251]</td>
<td></td>
<td></td>
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<tr>
<td>Depressive Symptoms</td>
<td>-.075 (.014)</td>
<td>-.302</td>
<td>-5.240</td>
<td>.000</td>
<td>[-.103, -.047]</td>
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</tbody>
</table>
Lastly, a hierarchical stepwise multiple linear regression analysis was used to predict services QoL from depressive symptoms, anxiety symptoms, anhedonia, hyperactivity/ distractibility, and positive symptoms, after controlling for age, gender, and patient status. None of these factors made a significant contribution, thus no mental state indicators were included in the final model. Table 5 presents the results for the model including the regression coefficients, t-statistics, p-values, 95% confidence intervals, and R-squared values (i.e. model fit).

Table 5.

Regression Analysis: Services Quality of Life

<table>
<thead>
<tr>
<th>Model</th>
<th>B (SE)</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>95% CI for B</th>
<th>R^2</th>
<th>ΔR^2</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td>.013</td>
<td>.025</td>
<td>.110</td>
<td>.013</td>
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<td></td>
<td></td>
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<tr>
<td>Gender</td>
<td>-.177 (.141)</td>
<td>-.081</td>
<td>-1.257</td>
<td>.210</td>
<td>[-.454, .100]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.009 (.022)</td>
<td>.026</td>
<td>.410</td>
<td>.682</td>
<td>[.034, .053]</td>
<td></td>
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<tr>
<td>Patient Status</td>
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<td>.131</td>
<td>2.045</td>
<td>.042</td>
<td>[.011, .592]</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Discussion

Quality of life represents an important outcome measure and has become increasingly utilized within healthcare, including mental health research (Youngstrom, 2013). It has previously been stated that no variable is more clinically important or significant than quality of life, as it is a very central aspect of an individual’s everyday functioning and experience (Kazdin, 1993). Although the impact of mental health disorders on QoL has been more extensively studied within adult populations, research specifically examining the association between mental health and QoL within pediatric populations is largely lacking.

The present study addressed this gap in the literature by examining the association between numerous mental state indicators, namely depressive symptoms, anxiety symptoms, anhedonia, hyperactivity/distractibility, and positive symptoms, and self-reported QoL in children and youth receiving mental health services. This is significant because ours is the first study, to our knowledge, that has included all five mental state indicators within the same multivariate model investigating determinants of QoL in a pediatric population with mental health problems. Using such a comprehensive set of predictor variables reduces the risk of potential bias, such as performing partial analyses that can provide misleading findings.

As hypothesized, depressive symptoms was the strongest predictor of overall QoL, such that higher levels of depressive symptoms were associated with lower overall QoL. Furthermore, at the sub-domain level, higher anhedonia and depressive symptoms were associated with lower social QoL, and higher depressive symptoms alone were
associated with lower basic needs and individual QoL. No mental state indicators were predictive of having a higher or lower QoL pertaining to services (i.e. school and treatment). Ultimately, the results suggest that lower overall and domain-specific QoL may be predicted more strongly by internalizing symptoms (i.e. depressive symptoms and anhedonia). Potential explanations for the differential predictive ability of the mental state indicators on QoL are discussed, and clinical implications as well as future directions are suggested.

As mentioned, the literature on QoL and mental health disorders in child and adolescent populations is not substantive. However, consistent with one study examining self-reported QoL in youth with psychiatric disorders using the PedsQL, the average overall QoL score in our study was quite favorable at 75.3%, compared to 73.3% in the prior study (Bastiaansen et al., 2005). The current study found a relatively weak or non-existent relationship between gender, one of our control variables, and QoL; for example, overall QoL and three of the four sub-domains showed no significant relationship with gender. Only individual QoL was significantly related to gender, whereby males reported higher QoL scores within this sub-domain compared to females. This finding is in accordance with a prior study that found boys typically report higher QoL compared to girls, specifically within the physical and psychological domains (Meade & Dowswell, 2016).

The second variable that was controlled for in our study was age, which again was weakly correlated to QoL, as overall QoL and three of the four sub-domains showed no significant relationship with age. Only individual QoL was inversely related to age, with older children reporting lower QoL. This is consistent with a study conducted by Ravens-
Sieberer and colleagues (2007) that found younger children (i.e. ages 8-11 years-old) reported higher QoL compared to older children (i.e. ages 12-18 years old). Although the current study did not dichotomize age into younger and older sub-groups, a similar trend can be appreciated.

The final variable that was controlled for within our multivariate analyses was patient status (inpatient versus outpatient). Here, although there was no significant relationship between overall QoL and patient status, two of the four sub-domains were significantly related; outpatients reported higher basic needs and social QoL compared to inpatients. Similar to our results, Hansson (2006) found that patients in hospital settings have lower QoL compared to patients in community care settings; moreover, QoL increased when patients moved from inpatient to community care. Therefore, if patient status is used as a proxy for severity/complexity of mental health issues, it can be suggested that higher severity and complexity is linked to lower QoL.

The next section of the discussion will begin with a general overview of the main findings, followed by a more in-depth discussion of the results as they pertain to each predictor variable included in the study. An important note that has been highlighted quite consistently within QoL research, is that it can be difficult to compare findings across studies using different measures of QoL since the specific sub-domains can vary. However, parallels can be drawn between sub-domains of measures used in past research and the current study, which allows for an interesting and significant discussion to be held.
Across all outcome variables, the only mental state indicators predictive of a lower QoL were depressive symptoms and anhedonia, both of which are characterized as internalizing symptoms. Similar to our results, Weitkamp and colleagues (2013) found that internalizing, but not externalizing, symptoms were predictive of lower self-reported QoL. This study further reported that higher internalizing symptoms were associated with lower domain-specific QoL, including both social and psychological domains. This supports our findings (likening their psychological to our individual domain), with anhedonia and depressive symptoms predicting lower social QoL and depressive symptoms predicting lower individual QoL. To conclude, in line with previous literature, the current study has found that some mental state indicators have an effect on specific QoL domains, but not a generalized effect on all QoL domains (e.g., Lasalvia, Ruggeri, & Santolini, 2002). This highlights the importance of continuing to take into account the various sub-domains when conducting QoL research, in order to differentiate the impact of certain determinants on specific areas of QoL.

Major depressive disorder has consistently been associated with a lower QoL, with depressive symptomology being inversely related to QoL ratings (Kennedy, Eisfeld, & Cooke, 2001; Berlim & Fleck, 2007). As hypothesized, depressive symptoms was the strongest, and in fact only, significant predictor of overall QoL in the current study. More specifically, as the levels of depressive symptoms increased, self-reported overall QoL decreased. This finding is strongly supported by the literature; for example, ranking the influence of different aspects of psychopathology on QoL, the severity of depressive symptoms has been found to be the most consistently and most strongly related to QoL (Corrigan & Buican, 1995). Furthermore, subjective QoL has been found to be worse in
those with depression compared to other psychiatric conditions. Gupta and colleagues (1998) reported that patients suffering from either depression or dysthymia had lower subjective QoL compared to those diagnosed with schizophrenia. Moreover, inpatients with unipolar or bipolar depression have reportedly worse QoL compared to patients with mania or schizophrenia (Russo et al., 1997); this finding will also be relevant in the subsequent discussion on how positive symptoms relate to quality of life.

Our finding that depressive symptoms was the strongest predictor of overall QoL is also in accordance with health economics research, which has found that dysthymia and MDD are associated with the largest decrease in QUALYS (Saarni et al., 2007). Additionally, in a study examining predictors of QoL longitudinally, the researchers found that a change in subjective QoL at follow-up was predicted by the change in depressive symptomology (Pyne et al., 1997). Finally, our results are further supported by the finding that mood disorders are the most influential determinant of lower QoL, with depression being a highly prevalent mood disorder in children and adolescents (Arnold, Witzeman, Swank, McElroy, & Keck, 2000; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Although ours is the first study to our knowledge that has found depressive symptoms to be the strongest predictor of overall QoL when examined head-to-head with the other four mental state indicators, these previous findings support a general consensus for the strong relationship between depressive symptomology and QoL.

Beyond the influence of depressive symptoms on overall QoL, the current study also found depressive symptoms was the only predictor of lower QoL on two of the four sub-domains. Firstly, we found that as depressive symptoms increased, QoL on the
individual sub-domain decreased. As previously discussed, different measures of QoL are composed of varying sub-domains; however, some overlap exists in the emotional functioning subdomain of other measures and the individual subdomain of the interRAI SQoL-ChYMH (which includes items such as “I feel good about myself”; Stewart et al., in press). Therefore, our finding is in accordance with a previous report that showed higher depressive symptoms to be associated with lower emotional functioning (Bastiaansen et al., 2004). Secondly, we also found that as depressive symptoms increased, QoL on the basic needs sub-domain decreased, such as a decrease in satisfaction with food and safety. Parallels can potentially be drawn with a previous study that found depression is linked to unmet needs, although the needs being measured in this prior study relate more to treatment needs, not an individual’s basic needs (Houtjes, van Meijel, Deeg, & Beekman, 2011). Depressive symptoms have also been shown to be associated with household food insecurity in particular (Laraia, Borja, & Bentley, 2009); however, this association has yet to be demonstrated in a child/adolescent population specifically. Therefore, the finding that depressive symptoms predicts QoL as it pertains to basic needs, such as food, safety, living conditions, and privacy, in this younger population with mental health challenges, is novel.

Despite our findings of a significant bivariate relationship between anxiety symptoms and overall and domain-specific (basic needs, social, individual) QoL, anxiety symptoms were not a significant predictor of QoL at the multivariate level. Although this finding may initially seem unexpected since past research has found an association between anxiety and QoL, it is in fact supported by a more in-depth review of the literature. Particularly, studies that have singularly examined the influence of anxiety on
QoL, thereby excluding other types of psychopathology in their analyses, have reported a significant association between anxiety and QoL (Rapaport, Clary, Fayyad, & Endicott, 2005). However, when other clinical factors such as depressive symptoms are included in the analysis, this finding no longer holds true. For example, in a study examining the role of several negative factors, including depressive symptoms, anxiety symptoms, and stress, on overall and domain-specific (i.e. physical, psychological, autonomy, social, and school) QoL in youth, depressive symptoms was the strongest predictor of overall QoL, and also significantly predicted the greatest number of QoL sub-domains (Freire & Ferreira, 2018). Furthermore, anxiety symptoms did not predict overall or domain-specific QoL. Therefore, this previous study supports our current results, as the researchers similarly found that depressive (and not anxiety) symptoms significantly predicts QoL when both factors are included in the same multivariate model.

In another study examining self-reported QoL in school children with anxiety and/or depressive symptoms, depressive symptoms indicated lower QoL compared to having anxiety symptoms, with depression explaining most of the variance in relation to QoL (Martinsen et al., 2016). The authors offered a potential explanation for this finding in that common symptoms of depression (e.g., anhedonia, low mood, decreased energy) may be the catalyst for experiencing lower QoL in several areas, seeing as these symptoms are associated with decreased joy and activity. Moreover, depressive symptoms may distort the child’s perception of him- or herself and their future. Thus, the prior study concludes that since anxiety symptoms were not associated with QoL in the multivariate analyses, they do not affect QoL to the same extent as depressive symptoms, which is in accordance with our findings (Martinsen et al., 2016).
Our results are further supported by the finding that although patients with certain anxiety disorders, such as panic disorder and obsessive-compulsive disorder, have lower QoL compared to the general population, they typically have better QoL compared to depressed patients (Sherbourne et al., 1996; Koran, Thienemann, & Davenport, 1996). Taken altogether, our finding that depressive symptoms significantly predicts QoL, whereas anxiety symptoms do not, when included within the same multivariate model is well supported by the literature.

Anhedonia is typically characterized by a lack of interest in social interaction, lack of motivation, and withdrawal from activities of interest. Anhedonia is a core symptom of MDD, and also one of the negative symptoms in schizophrenia (American Psychiatric Association, 2013). Although research has yet to tease apart the effect of anhedonia versus other mood-related depressive symptoms on quality of life, other fields are starting to examine anhedonia as a separate entity. For example, a study examining risk factors of adolescent self-harm found that anhedonia may increase one’s vulnerability for self-inflicted harm, beyond depressive symptomatology (Spijker, de Graaf, ten Have, Nolen, & Speckens, 2010). Furthermore, although numerous studies have investigated the differential effect of negative and positive symptoms on QoL in schizophrenic patients, anhedonia has again not been teased apart as a separate factor but grouped in with negative symptoms more broadly. Therefore, one of the strengths of the current study is that it is the first one, to our knowledge, that separated the effect of mood-related depressive symptoms and anhedonia in a multivariate model evaluating QoL in youth with mental health issues.
In our multivariate analyses, anhedonia was the strongest predictor of domain-specific social QoL, followed by depressive symptoms. We found that as both anhedonia and depressive symptoms increased, self-reported QoL decreased within the social domain. Due to the fact that this is the first study to include mood-related depressive symptoms and anhedonia as distinct predictors of QoL within the same model, there is no prior literature that directly supports this finding; however, indirect support comes from generalizing the findings of past research. One study examining the relationship between QoL and depression found that even after controlling for mood, physical complaints, and enjoyment of activities, depression continued to have a significant effect on QoL (Barge-Schaapveld, Nicolson, Berkof, & DeVries, 1999). This suggests other unmeasured aspects of depression have an impact on self-reported well-being, such as aspects related to anhedonia (including lack of interest in social interaction or lack of motivation), which would support our finding.

Research has also shown that negative social interactions are related to lower QoL, including lower satisfaction with leisure activities (Yanos et al., 2001). One potential explanation for this could be that if the majority of social interactions with others tend to be negative (i.e. interacting with people who are critical, expect too much, are overprotective, or make one upset), this may cause an individual to withdraw socially, potentially leading to symptoms of anhedonia and a lower social QoL. Thus, it could be proposed that anhedonia acts as a mediator between negative social interactions and experiencing a lower QoL (Yanos et al., 2001).

Higher QoL has also been shown to be associated with higher levels of social integration (Fleury et al., 2013). Social integration indicates that the individual shares
common interests and activities with a network of friends and is less likely to experience social isolation or loneliness, which is the opposite of social disengagement or anhedonia (Langeland & Wahl, 2009). Therefore, it could be suggested that if social integration is linked to higher QoL, then social disengagement or anhedonia may be linked to lower QoL, which would be in accordance with our findings.

As previously mentioned, past QoL research has simply included anhedonia as part of depressive symptomology, and even more broadly, within internalizing symptomology. Therefore, although anhedonia has not directly been linked to lower social QoL, we can draw parallels between these other areas of research. It has been shown that depressive symptoms can predict social QoL, with increased levels of depressive symptoms being associated with lower levels of social QoL (Freire & Ferreira, 2018). Furthermore, due to the fact that the SQoL-ChYMH includes family functioning within the social domain, a previous study showing depression is associated with unhealthy family functioning is in support of the current finding that anhedonia and mood-related depressive symptoms are associated with lower social QoL (Wang, Mansfield, Zhao, & Keitner, 2013). Finally, internalizing symptoms, which include both depressive symptoms and anhedonia, have been shown to be associated with lower social QoL (Weitkamp et al., 2013). Overall, the lack of prior research into the relationship between QoL and anhedonia specifically only highlights the importance and significance of the current study’s finding. By including both mood-related depressive symptoms and anhedonia as distinct predictors in our model, we were able to tease apart their independent effects on QoL subdomains. Therefore, in previous studies that have reported a link between depression and lower social QoL, we could postulate that it was
the anhedonia symptoms that made a more significant contribution to this finding compared to mood-related symptoms, although both symptomologies influence social QoL to varying degrees.

Past research that has found negative symptoms are related to QoL (in schizophrenic patients) also supports our finding that anhedonia is associated with lower QoL. To note, this next section will somewhat overlap with the subsequent discussion on positive symptoms and QoL, since QoL research in schizophrenia typically reports the effect of both positive and negative symptoms simultaneously. There is a general consensus among studies that negative symptoms are strongly associated to QoL in patients with schizophrenia, with negative symptoms being a major source of reduction in their QoL (e.g., Norman et al., 2000; Eack & Newhill, 2007). Furthermore, negative symptoms are inversely correlated to life functioning, and directly correlated to social disability (Galuppi, Turola, Nanni, Mazzoni, & Grassi, 2010; Wiersma et al., 2000). Therefore, taken altogether, one could infer that past research supports the current finding that anhedonia, a negative symptom, is associated with lower QoL in children and adolescents with mental health issues.

Although our model predicted lower social QoL from the negative symptom anhedonia, we did not find a significant association between positive symptoms and overall or domain-specific QoL. These two findings are in accordance with previous literature that has consistently found negative, but not positive symptoms, to be associated with QoL. For example, negative symptoms have been shown to be related to both subjective QoL and HR-QOL, whereas positive symptoms were not (Saarni et al., 2010). Negative symptoms are also strongly related to QoL and functioning ability in
individuals who are vulnerable to psychosis; however, the same is not true for positive symptoms (Svirskis et al., 2007). Furthermore, it has been reported that negative, but not positive, symptoms upon admission can predict psychosocial functional outcome (Milev, Ho, Arndt, & Andreasen, 2005). In a longitudinal study, negative symptoms at the onset of schizophrenia predicted QoL scores at follow-up, whereas positive symptoms did not; moreover, change in negative symptom scores has been shown to be the strongest predictor of subsequent QoL scores in schizophrenic patients (Ho, Nopoulos, Flaum, Arndt, & Andreasen, 1998; Bow-Thomas, Velligan, Miller, & Olsen, 1999).

Several explanations have been proposed for this lack of association between positive symptoms and QoL. One explanation is grounded in the idea that an individual’s psychopathology may influence his or her ability to validly and reliably assess well-being. An example of this potential bias is called affective fallacy, which occurs when individuals rely solely on their current/momentary affective state to judge their overall life satisfaction. Consequently, it has been found that while individuals with depression typically rate their well-being as worse than an independent observer, those experiencing a manic episode typically rate their well-being more favourably (Katschnig, 2006). However, in light of the aforementioned finding by Lehman (1983) that people with severe mental illness are able to meaningfully report on their subjective QoL, this explanation may not be the most plausible.

Another potential explanation is based on the finding that better insight into having a psychotic disorder is related to decreased QoL (Hasson-Ohayon, Kravetz, Roe, David, & Weiser, 2006). Interestingly, the majority of individuals who have been diagnosed with a mental illness often lack insight into their disorder, and this could be
argued to be particularly true in younger populations whose brains are still in the process of developing and maturing (particularly the frontal lobes, which are responsible for higher-order functioning) (Mohamed et al., 2009; Johnson, Blum, & Giedd, 2009). Therefore, it can be suggested that higher positive symptoms were not associated with lower QoL in the current study given that the participants were children and adolescents, thus may arguably lack insight into their illness, and so their QoL is unaffected.

Finally, a possible explanation for this lack of association in youth specifically comes from the findings of a meta-analysis on psychotic symptoms and QoL in schizophrenia (Eack & Newhill, 2007). This study found that although there was no difference in association between negative symptoms and QoL in either first-episode or chronic schizophrenia, this was not true for positive symptoms. More specifically, the association between positive symptoms and QoL was substantially reduced in individuals with first-episode schizophrenia compared to chronic patients. This suggests that positive symptoms may have less of an impact on QoL in individuals who are in the early stages of their illness. Considering the participants of the current study were children and adolescents from ages 7-18 years, and that the onset of schizophrenia typically begins during late adolescence or early adulthood, it can fairly be assumed that those individuals experiencing positive symptoms would be at the early stages of the illness, thus potentially explaining the lack of relationship between those two factors.

Lastly, the current study did not find a significant association between hyperactivity/distractibility and overall or domain-specific QoL. This finding is somewhat consistent with previous literature which has reported either a non-significant or negative relationship between ADHD and QoL (Danckaerts et al., 2010). Therefore, it
was not entirely unexpected that these symptoms did not predict lower QoL in youth, particularly since the current study used self-report as opposed to parent-proxy measures.

Previous research findings are mixed regarding the relationship between ADHD symptoms, such as hyperactivity and distractibility, and QoL (Danckaerts et al., 2010). More specifically, ADHD is found to be associated with QoL when parental reports are used to measure this outcome; yet, there is a much weaker, and sometimes non-existent relationship when QoL is reported by the child him/herself. There are several reasons that have been proposed to explain this discordance in QoL ratings. However, before that discussion, it is critical to point out that regardless of the explanation for the discordance, a systematic review on QoL in ADHD found only 7 of the thirty-six included studies used child self-reports to measure QoL (Danckaerts et al., 2010). In light of the well-established parent-proxy problem, this highlights the importance of future research using self-report measures in order to truly understand the impact of the disorder from the child’s perspective.

One explanation for the discordance is that children with ADHD may have an over-optimistic view of their situation, especially compared to children with other psychiatric conditions, such as depression (Danckaerts et al., 2010). A similar effect is seen in studies investigating self-concept and self-esteem in youth with ADHD (Hoza, Pelham, Dobbs, Owens, & Pillow, 2002). It has been hypothesized that these findings are the result of a positive illusory bias, meaning that children with ADHD may overestimate their own performance abilities for the purpose of protecting their positive self-image (Ohan & Johnston, 2002). Other suggested reasons for the discrepancy that focus on the role of the child include they may want to conceal their problems, it may be a coping
mechanism (i.e. to ignore their problems), or it may be a systematic mistake in rushing through the questionnaire as a result of their impulsive cognitive style (Klassen, Miller, & Fine, 2006).

Some explanations for the discrepancy between child- and parent-reported QoL in ADHD populations focus more so on the role of the parent. For example, one simple explanation that has been proposed is that in studies where parents report on both the QoL as well as ADHD symptomology, there is the potential for bias which could conflate the results (Matza et al., 2004). It has also been found that parents of children with ADHD tend to report increased parenting stress, alcohol consumption, marital conflict, and depression (Anastopoulos, Guevremont, Shelton, & DuPaul, 1992; Cunningham, Benness, & Siegel, 1988; Pelham & Lang, 1993). Therefore, parents may be potentially biased when reporting their child’s QoL if they are influenced by perceptions of their own QoL that has been negatively impacted by their child’s disorder. Furthermore, while a study found that compared to normative children, parents rated their children’s psychosocial health as worse, it is interesting to point out that items used to measure psychosocial health included the emotional and time impact on parents (Klassen, Miller, & Fine, 2004). Therefore, it appears that some of the items used to measure QoL in the child are in fact, heavily parent-focused, which could potentially help explain the discordance.

A final potential explanation comes from an interesting study that found that while children with MDD were more commonly reported to be upset by their symptoms, children with ADHD more often annoyed or upset their parent/caregiver (Sawyer et al., 2002). This finding helps explain two of the current study’s findings:
hyperactivity/distractibility was not predictive of a lower QoL, whereas higher depressive symptoms strongly predicted lower QoL. Firstly, it appears that depressed children are personally affected by their symptoms (being upset by them) which could potentially impact how they view their QoL, such that they believe their QoL is lower. This is in contrast to children with ADHD who are not upset by their symptoms, therefore their symptoms do not have a negative impact on their view of their QoL. Secondly, if children with ADHD more commonly annoy or upset their parent/caregiver, and as previously discussed 1) the majority of studies on ADHD and QoL use parent-reports and 2) some parent-proxy measures include items that are heavily parent-focused, it is not surprising that much of the literature has reported lower QoL in children with ADHD (Danckaerts et al., 2010; Klassen, Miller, & Fine, 2004). Overall, despite the reasoning for the discrepancy, it is vital for future research to use self-report QoL measures in order to gain the perspective of the children and adolescents themselves.

Clinical Implications

Quality of life measures are increasingly being used within healthcare, including mental health research, because they have significant clinical utility (e.g., Espallargues et al., 2000). On a broad level, QoL data can help with the allocation of resources within health services (Danckaerts et al., 2010). On a more individual level, QoL measures can help monitor a patient’s progression over time and determine the impact of a specific intervention (Greenhalgh & Meadows, 1999). Furthermore, it has been stated that the main goal of healthcare is to improve patients’ perceptions of their health and the extent to which health problems interfere with their QoL; therefore, an important part of determining whether a treatment was successful or not is whether it improved the child’s
QoL (Spitzer et al., 1995). Lastly, since most mental health problems tend to persist, an important treatment goal should be improvement in quality of everyday life (Hofstra, Van, & Verhulst, 2000; Schmeck & Poustka, 2006).

In addition to QoL measures being used to help determine treatment efficacy, they can also assist in the diagnostic process. For example, Espallargues and colleagues (2000) found that by asking patients to provide feedback on their own quality of life, this allowed for more undiagnosed patients to be identified. Moreover, assessing QoL represents an important part of the diagnostic process because it provides a window into the mind of the child and into their perceptions, thus gaining insight into which areas of functioning the child is struggling with the most (Bastiaansen et al., 2004). This, in turn, helps with service planning as the clinician can use this insight to focus on outcomes that the patient feels are important.

The current study found that the two mental state indicators associated with lower overall or domain-specific QoL are depressive symptoms and anhedonia. This is highly significant because they represent the two core symptoms of major depressive disorder (MDD), which has been described as a significant public health concern due to its numerous adverse consequences, including disability, secondary morbidity, and excessive mortality (Berlim & Fleck, 2007). MDD has been ranked 4th place in terms of overall burden of all diseases worldwide; additionally, if only incapacity alone was taken into consideration, MDD would occupy first position (Murray & Lopez, 1997). There is also a high economic cost associated with MDD, with annual direct and indirect costs amounting to $43 billion (Hall & Wise, 1995). Therefore, taken altogether, these findings highlight the possible benefit of routinely screening for depressive and anhedonia.
symptoms in both preventative work and treatment planning, which could potentially improve individual quality of life, and help reduce the economic burden of the disorder.

Despite anxiety not being a significant predictor of QoL in the full multivariate model, it was significantly correlated to overall QoL at the bivariate level along with several other sub-domains, and so it may still represent a potential clinical target. For example, although the key recommendation based on the results of this study is that clinicians screen for depressive/anhedonia symptoms in youth receiving mental health services, it may also be beneficial to screen for anxiety symptoms. This is in line with current literature which has reported that within the child and adolescent population, internalizing disorders of depression and anxiety are quite prevalent, typically comorbid, and can impair a child’s everyday functioning (Costello et al., 2003; Angold, Costello, & Erkanli, 1999; Birmaher et al., 1996). Furthermore, a child who is experiencing subthreshold symptoms of anxiety and depression may be at risk for later developing a full disorder, along with other serious problems (Kovacs & Lopez-Duran, 2010). Therefore, screening for anxiety symptoms, along with depressive/anhedonia symptoms may prove to be clinically impactful.

Finally, research investigating predictors of QoL in children and adolescents with mental health disorders is useful because it allows clinicians to respond in more targeted ways. Further, domain-specific research is critically important because by understanding which domains of QoL are affected by specific psychopathologies, clinicians can then focus on those particular QoL domains during assessment, diagnosis, and treatment planning. In relation to the current study, understanding that anhedonia and depressive symptoms affect social QoL, whereas strictly depressive symptoms are related to lower
individual and basic needs QoL, healthcare professionals can focus on those domains throughout the patient’s clinical course. Overall, it can be suggested that when developing a treatment plan for children and adolescents who are receiving care for complex mental health problems, it may be beneficial to include intervention strategies targeting depressive and anhedonia symptoms, as these are significantly associated with lower QoL in this population. Therefore, effective treatment of these symptoms could potentially lead to the greatest improvement in QoL.

Limitations

While the present study has numerous strengths, including the relatively large sample size and internationally-used comprehensive assessment tools, it also has a few limitations. The first of these limitations is in regard to the generalizability of the findings. Due to the fact that all of the children and youth assessed were accessing inpatient or outpatient mental health services from one tertiary mental health center, the results may not be generalizable to a community-based sample. Secondly, the study cannot make any conclusions based on causality because of the cross-sectional nature of the data. This means the directionality of the findings cannot be determined; for example, we cannot conclude that depressive symptoms cause lower overall QoL in children and youth with mental health issues, but only that there is a significant association between these two factors. Finally, the participants of the study represent a convenience sample, thus were not randomly selected, since both assessment instruments (ChYMH and SQoL-ChYMH) were completed as standard of care at the tertiary mental health center in the Province of Ontario.
Future Directions

Additional future research should examine whether the present study’s findings are consistent when participants comprise of a community sample. This would help establish the generalizability of our results. Moreover, further longitudinal studies can investigate whether there are critical periods during which certain mental state indicators are more predictive of lower QoL; for example, depressive symptoms may be more predictive of QoL in adolescence compared to childhood.

While the current study selected to examine the association between mental state indicators, or symptomology, and QoL, future research should examine whether similar results are found when full mental disorder diagnoses are substituted for symptomology. For example, would major depressive disorder also be the strongest predictor of overall QoL when compared to anxiety disorders, ADHD, and the other corresponding mental health disorders?

Finally, the current study examined the influence of the mental state indicators on four sub-domains of QoL, but those sub-domains could be broken down further into 10 subcategories (i.e. the services sub-domain is further categorized into “school” and “treatment”; social is further categorized into “respect from others”, “friends and activities”, and “family”). Therefore, it would be interesting for a future study to determine whether the mental state indicators have a stronger association to a specific sub-categorization within a particular domain compared to others; for example, is anhedonia more predictive of social QoL with respect to family versus friends and activities?
Conclusion

Children with mental health problems have a significantly worse quality of life in comparison to healthy children, or those with chronic medical conditions (Sawyer et al., 2002). Thus, identifying factors predictive of overall and domain-specific QoL can help with the development of effective intervention strategies, particularly since improving QoL is considered a key treatment goal within mental healthcare. The results of the present study suggest that children and adolescents with higher depressive symptoms are more likely to report a lower overall QoL. Furthermore, at the sub-domain level, the results suggest that children and youth with higher anhedonia and depressive symptoms are more likely to have lower social QoL, and those with higher depressive symptoms are more likely to have lower individual and basic needs (i.e. food and safety) QoL. Finally, no mental state indicators were predictive of having a higher or lower services (i.e. school and treatment) QoL. Understanding the predictors of overall and domain-specific QoL in children and youth receiving mental health services allows clinicians to respond in more targeted ways and helps facilitate the development of evidence-informed intervention strategies.
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Appendix

Research Ethics Board Approval

Date: 6 December 2018
The Dr. Shannon Stewart
Project ID: 112385

Study Title: An Examination of Predictors of Quality of Life in Children and Adolescents receiving Mental Health Services
Application Type: HSREB Initial Application
Review Type: Delegated
Full Board Reporting Date: 15 Jan 2019
Date Approval Issued: 05 Dec 2018 10:05
REB Approval Expiry Date: 05 Dec 2019

Dear Dr. Shannon Stewart,

The Western University Health Science Research Ethics Board (HSREB) has reviewed and approved the above mentioned study as described in the WREM application form, as of the HSREB Initial Approval Date noted above. This research study is to be conducted by the investigator noted above. All other required institutional approvals must also be obtained prior to the conduct of the study.

Documents Approved:

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Document Type</th>
<th>Document Date</th>
<th>Document Version</th>
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<tr>
<td>InterRAI Child and Youth Mental Health Assessment (CYMHA)</td>
<td>Other Data Collection Instruments</td>
<td>17 Oct 2018</td>
<td>1.0</td>
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<tr>
<td>Self-report Quality of Life - Child and Youth Mental Health (SQOL-C/YMHA)</td>
<td>Other Data Collection Instruments</td>
<td>17 Oct 2018</td>
<td>1.0</td>
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<tr>
<td>Thesis Proposal: Quality of Life</td>
<td>Protocol</td>
<td>17 Oct 2018</td>
<td>1.0</td>
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</table>

No deviations from, or changes to, the protocol or WREM application should be initiated without prior written approval of an appropriate amendment from Western HSREB, except when necessary to eliminate immediate hazards to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

REB members involved in the research project do not participate in the review, discussion or decision.

The Western University HSREB operates in compliance with, and is constituted in accordance with, the requirements of the TriCouncil Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2); the International Conference on Harmonisation Good Clinical Practice Consolidated Guideline (ICH GCP); Part C, Division 5 of the Food and Drug Regulations; Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations and the provisions of the Ontario Personal Health Information Protection Act (PHIPA 2004) and its applicable regulations. The HSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB00000940.

Please do not hesitate to contact us if you have any questions.

Sincerely,

Katelyn Harris, Ethics Officer on behalf of Dr. Joseph Gilbert, HSREB Chair

Note: This correspondence includes an electronic signature (validation and approval via an online system that is compliant with all regulations).
Curriculum Vitae

EDUCATION

Master of Arts (MA), School and Applied Child Psychology (May, 2019)
Western University, London, ON

Master of Science (MSc), Laboratory Medicine & Pathobiology (LMP) (June, 2016)
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Honours Bachelor of Science (BSc), Human Biology and Psychology (June, 2014)
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RELATED WORK EXPERIENCE

Research Assistant (September 2017 – Present)
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Teaching Assistant (September 2018 – April 2019)
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AWARDS AND SCHOLARSHIPS

Ontario Graduate Scholarship (OGS), Western University (MA) (2018 – 2019)

Western Graduate Research Scholarship, Western University (MA) (2017 – 2019)

Canada Graduate Scholarship (CIHR), University of Toronto (MSc) (2015 – 2016)

LMP Graduate Award, University of Toronto (MSc) (2015 – 2016)

UofT Fellowship, University of Toronto (MSc) (2014 – 2015)

BTRC New Investigator Travel Award, University of Toronto (MSc) (2014 – 2015)

Silver Medal, University of Toronto (Hon. BSc) (June 2014)

UofT In-Course Scholarships, University of Toronto (Hon. BSc) (2012 – 2014)

Dean’s List, University of Toronto (Hon. BSc) (2012 – 2014)