

2019-09-25

# A Mixed Studies Systematic Review Evaluating the Effectiveness of Adolescent Inpatient Eating Disorder Treatment

Patel, Shruti

---

Patel, S. (2019). A Mixed Studies Systematic Review Evaluating the Effectiveness of Adolescent Inpatient Eating Disorder Treatment (Master's thesis, University of Calgary, Calgary, Canada). Retrieved from <https://prism.ucalgary.ca>.

<http://hdl.handle.net/1880/1111100>

*Downloaded from PRISM Repository, University of Calgary*

UNIVERSITY OF CALGARY

A Mixed Studies Systematic Review Evaluating the Effectiveness of Adolescent  
Inpatient Eating Disorder Treatment

by

Shruti Patel

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES  
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF MASTER OF NURSING

GRADUATE PROGRAM IN NURSING

CALGARY, ALBERTA

SEPTEMBER, 2019

© Shruti Patel 2019

## **Abstract**

Research literature discussing effective treatment components for adolescents with eating disorders remains unclear. To ensure timely and informed decision making in clinical practice for adolescent inpatient eating disorders treatment, a systematic review and synthesis of relevant literature is warranted. The objective of the mixed studies systematic review was to identify, assess, and synthesize the best available evidence on inpatient eating disorder programs for adolescents. A literature search was conducted using five electronic databases on the EBSCO and OVID interfaces. Studies were selected by two reviewers. Selection was based on mutually agreed upon inclusion and exclusion criteria targeting adolescents nine to 21 years of age diagnosed with eating disorders on an inpatient setting. Of 2389 titles and abstracts identified, 160 full text articles were screened, and 43 met the inclusion criteria. Of the 43 included studies, 22 focused on specific interventions, while 11 focused on either caregiver or patient perceptions of inpatient treatment. The Joanna Briggs Institute critical appraisal tool for randomized controlled trials, cohort studies, and case control studies was used to assess quantitative studies as appropriate, while Joanna Briggs Institute critical appraisal tool for qualitative research was used to assess qualitative studies. Although evidence around interventions and practices for inpatient eating disorders treatment is available, it is not consistent across studies. Further research should consider identifying effective, evidence-based interventions and practices for adolescent inpatient eating disorder treatment towards positive patient outcomes.

*Keywords:* eating disorders, adolescent psychiatry, treatment

## **Acknowledgements**

Firstly, I would like to express my sincere gratitude and appreciation to my supervisor, Dr. Carol Ewashen for the endless support throughout my Masters. Her guidance, motivation, and immense knowledge have consistently helped me throughout my time of research and writing this thesis. I could not have imagined a better supervisor and mentor for my Masters – thank you!

I would also like to thank my thesis committee, Dr. Karen Benzies and Dr. Alix Hayden for their essential need to ask the hard questions that pushed me to widen this research from various perspectives. Their continuous guidance and encouragement along with their prompt feedback helped shape this thesis into what it is.

Finally, I would like to thank my family: my parents and my sister for being the pillars to my life without whom I could not stand – you are my ultimate inspiration for everything. And my love, thank you always.

## **Dedication**

For Baa.

## Table of Contents

|   |        |
|---|--------|
| Abstract .....  | ii     |
| Acknowledgements .....  | iii    |
| Dedication .....  | iv     |
| Table of Contents .....   | v      |
| List of Tables .....  | vii    |
| List of Figures .....   | viii   |
| List of Abbreviations .....   | ix     |
| <br>Chapter 1 Introduction .....  | <br>10 |
| Background .....  | 10     |
| Inpatient Eating Disorder Programs and Treatment Interventions .....    | 12     |
| Research Question and Objectives .....                                  | 14     |
| Thesis Chapter Overview .....   | 15     |
| <br>Chapter 2 Background Literature Review .....                        | <br>16 |
| Inpatient Eating Disorder Programs .....                                | 16     |
| Interventions targeting physical consequences of eating disorders ..... | 19     |
| Interventions targeting psychological aspects of eating disorders. .... | 22     |
| Other interventions involved in eating disorder treatment. ....         | 28     |
| Perceptions of inpatient treatment programs .....                       | 29     |
| Perspectives of health care providers. ....                             | 29     |
| Perspectives of patients. ....  | 30     |
| Purpose of Thesis .....   | 31     |
| <br>Chapter 3 Methods .....   | <br>33 |
| Mixed Studies Systematic Review Method .....                            | 34     |
| Search strategy .....   | 34     |
| Pilot search. ....  | 37     |
| Systematic search. ....   | 39     |
| Full-text screening and review. ....                                    | 39     |
| Critical Appraisal of Included Studies .....                            | 54     |
| Synthesis Method .....  | 54     |
| <br>Chapter 4 Results .....   | <br>56 |
| <br>Chapter 5 Discussion .....  | <br>63 |
| Family Based Treatment .....  | 63     |
| Cognitive Behaviour Therapy .....                                       | 67     |
| Cognitive Remediation Therapy .....                                     | 68     |
| Other Eating Disorder Interventions .....                               | 70     |
| Therapeutic Alliance .....  | 71     |
| Caregiver Perspective .....   | 72     |
| Nutritional Therapy and Refeeding .....                                 | 74     |
| Patient Perspective .....   | 78     |

|  |     |
|--|-----|
| Chapter 6 Conclusion.....                          | 81  |
| References .....                                   | 87  |
| Appendix A: Critical Appraisal of Studies .....    | 102 |
| Appendix B: Inclusion and Exclusion Criteria ..... | 119 |
| Appendix C: Search Strategies .....                | 121 |

## List of Tables

|   |     |
|---|-----|
| Table 1.0. <i>Overview of included studies.</i> .....   | 43  |
| Table 1.1. <i>Assessment of methodological quality of randomized controlled trials</i> .....          | 56  |
| Table 1.2. <i>Assessment of methodological quality of cohort studies</i> .....                        | 58  |
| Table 1.3. <i>Assessment of methodological quality of case control studies</i> .....                  | 60  |
| Table 1.4. <i>Assessment of methodological quality and risk of bias of qualitative research</i> ..... | 61  |
| Table 1.5. <i>Inclusion and exclusion criteria of pilot search</i> .....                              | 119 |
| Table 1.6. <i>Inclusion and exclusion criteria of systematic search</i> .....                         | 120 |
| Table 1.7. <i>MEDLINE Search Terms (from OVID Interface)</i> .....                                    | 121 |
| Table 1.8. <i>PsycINFO Search Terms (from OVID Interface)</i> .....                                   | 123 |
| Table 1.9. <i>Embase Search Terms (from OVID Interface)</i> .....                                     | 125 |
| Table 2.0. <i>CINAHL Search Terms (from EBSCO Interface)</i> .....                                    | 127 |
| Table 2.1. <i>ERIC Search Terms (from EBSCO Interface)</i> .....                                      | 130 |



## List of Figures

|                                |    |
|--------------------------------|----|
| Figure 1. PRISMA diagram ..... | 41 |
|--------------------------------|----|

## **List of Abbreviations**

|       |  |
|-------|--|
| CBT   | Cognitive Behavioural Therapy                                |
| CBT-E | Cognitive Behavioural Therapy – Enhanced                     |
| CRD   | Centre for Reviews and Dissemination                         |
| CRT   | Cognitive Remediation Therapy                                |
| DSM-V | Diagnostic and Statistical Manual of Mental Disorders – Five |
| ED    | Eating Disorder  |
| FBT   | Family Based Therapy   |
| SSRIs | Selective Serotonin Reuptake Inhibitors                      |

## **Chapter 1 Introduction**

The increase in the prevalence of eating disorders amongst young people is an area of concern in the field of mental health nursing; specifically, in terms of service delivery. Less than a third of individuals diagnosed with eating disorders receive treatment; of those, only 40% to 60% reach symptom remission (Stice & Shaw, 2004). Due to the chronic nature and multifaceted presentation of eating disorders, a variety of treatment interventions in multiple settings are available. However, evidence for effective treatment interventions for adolescents with eating disorders remains unclear, especially in an inpatient hospital setting. Inpatient adolescent eating disorder treatment can be described as a program within an acute care environment. The inpatient program is designed to medically stabilize young people with serious eating disorders with a focus on restoring health. Treatment most often includes medical monitoring, nutritional rehabilitation, psychiatric consultation and group programming. Therefore, it is crucial to identify the current state of evidence on effective treatment interventions in inpatient adolescent eating disorder programs, analyze gaps in that knowledge, and as mental health nurses, work towards establishing standardized evidence-based treatment plans. As such, for my Master of Nursing thesis project, I conducted a mixed studies systematic review to examine the evidence on effective treatment interventions of inpatient adolescent eating disorders programs.

### **Background**

Individuals diagnosed with an eating disorder are characterized by “a persistent disturbance of eating or eating-related behavior that results in the altered consumption or absorption of food that significantly impairs physical health or psychosocial function” (DSM Library, 2013). According to the Diagnostic Statistical Manual – Fifth Edition, there are four

main categories of eating disorders, namely (a) anorexia nervosa, (b) bulimia nervosa, (c) binge eating disorder, and (d) eating disorder not otherwise specified. The most common eating disorders are anorexia nervosa and bulimia nervosa. Anorexia nervosa has a primary onset in adolescence.

With treatment costs being the highest among all psychiatric illnesses due to the extensive use of hospitalization, an examination evaluating the role of hospitalization on inpatient eating disorder programs is required (Madden, Miskovic-Wheatley, Wallis, Kohn, Lock, et al., 2015). Although eating disorder programs specialized on adolescents have proven to be effective, very few programs exist; therefore, adolescents with anorexia nervosa are often treated either on general adolescent psychiatric settings, in pediatric medical settings or in adult eating disorders settings (Naab et al., 2013). The course of treatment for individuals with eating disorders is unpredictable, and treatment varies depending on the severity of the disorder, with no consistent treatment method or standards of practice (Halmi, 2009). The complexities of eating disorders also make it a challenging disorder to treat. Mitchell et al., (2009) reported that general health care utilization in the United States among the eating disorders patient population is high. The lack of adequate training in the early identification and treatment of eating disorders may contribute to high health care utilization because most health care professionals only detect an eating disorder once severe physical and psychiatric consequences have developed; thereby, increasing hospitalization expenses with treatment (Sim et al., 2010). It is important to note that such data on health care utilization among the eating disorders patient population is lacking for the Canadian context.

In Canada, health care is delivered through a publicly funded system and is guided by the Canada Health Act. Although the quality of healthcare is overseen by federal standards, delivery

of service within most provinces is provided through Canada's largest healthcare program, Medicare (Norris et al., 2013). The distribution and budgetary allowances afforded to eating disorder programs varies depending on the province. Also, the variability and depth of programming and services that exist throughout the country is not consistent in any one guiding treatment principle (Norris et al., 2013). Although Canadian eating disorder programs offer quality treatment and demonstrate innovative research and treatment development, treatment practices and program structures differ across the country with no consensus on best practice for medical and/or psychiatric treatment of adolescents with severe eating disorders in Canada (Norris et al., 2013). I argue that to ensure quality nursing and health service delivery among this patient population and to potentially decrease health care utilization among individuals with severe eating disorders, it is important to examine the evidence on the effectiveness of inpatient hospital eating disorder treatment programs.

### **Inpatient Eating Disorder Programs and Treatment Interventions**

Individuals diagnosed with eating disorders have the highest mortality rate among all psychiatric disorders (Shaw & Stice, 2016) and are the third most common chronic illness among adolescent females (Norris et al., 2013). However, only less than a third of individuals with eating disorders receive treatment and of those, it is effective only for 40% to 60% (Stice & Shaw, 2004). These statistics suggest that eating disorder treatment services are not easily accessible by the majority, and for those who do access treatment, the success rate is limited. Although there have been significant advances in understanding the etiology of eating disorders, for patients diagnosed with eating disorders the development of effective treatments has not resulted in improved care and treatment services because access to specialized care remains limited and highly variable (Nishizono-Maher et al., 2011). Receiving treatment in the right

place at the right time in an effective program where the individual can participate in treatment and move towards sustainable recovery is crucial to overcoming an eating disorder and sustaining health and well-being.

Eating disorder treatment can occur in multiple settings; however, the lack of knowledge and understanding around available treatment options is prevalent across settings (Reid, Williams, & Hammersley, 2009). Inpatient eating disorder treatment programs involve a multidisciplinary approach (Hay et al., 2013; Norris et al., 2013), where treatment providers include psychologists or psychiatrists (or both), dietitians, registered nurses, and allied healthcare specialists (Hay et al., 2013). A specialized inpatient eating disorder program consists of nutritional counselling and supervised meals, combined with individual and group psychotherapy along with medical care with a multidisciplinary health care team (Hay et al., 2013; Norris et al., 2013). Within Canada, there are a number of eating disorder treatment programs that operate out of tertiary care hospitals and offer care to adolescents (Norris et al., 2013). In the Canadian health care system, physicians and psychiatrists remain the primary gate keepers for accessing treatment, where the initiation of treatment begins with a medical diagnosis of an eating disorder. Reid, Williams, and Hammersley (2010) state that the recognition and diagnosis of an eating disorder is difficult due to the secretive nature of eating disorders because individuals are often unable to view their eating behaviors as a problem and may initially present for other complaints unrelated to their eating and body weight. Individuals admitted to an inpatient eating disorder program are individuals who are the most medically compromised. Typically, an eating disorder diagnosis is only considered when an individual presents with a drastic change in body weight over a short period of time, along with various physical complications. The earlier an eating disorder is diagnosed and treated, the better the outcome

(Reid, Williams, & Burr, 2010). Thus, there is an urgent need to improve timing of diagnosis, quality of care, and availability of treatment interventions to provide effective eating disorder programs (Nishizono-Maher et al., 2011). Of note, there is not much known about the different types of effective treatments or care interventions across different cultures, countries, and health care environments (Nishizono-Maher et al., 2011). No such best practice framework for treatment or intervention, honed to the particularities of person, place, and condition exists for those diagnosed with eating disorders (Mahr et al., 2015). This makes it imperative to systematically examine the existing evidence on treatment interventions in eating disorder programs, in the case of this study inpatient adolescent eating disorder programs, to better inform nurses and other health care professions to improve health outcomes for individuals with eating disorders, to understand what evidence informed best practices emerge, and to identify gaps in current practice.

### **Research Question and Objectives**

The purpose of the mixed studies systematic review was to determine the effectiveness of current adolescent inpatient eating disorder programs and treatment interventions. The research question was: “What is the current research evidence on the most effective program and treatment intervention components of adolescent inpatient eating disorder programs?”. The objectives were twofold:

- (a) to understand the research literature regarding this topic and identify the gaps in current knowledge.
- (b) to examine the evidence on eating disorder programs and treatment interventions for adolescents and their families in relation to the four main types of eating disorders;

namely, anorexia nervosa, bulimia nervosa, binge eating disorder, and eating disorder not otherwise specified.

### **Thesis Chapter Overview**

In Chapter 2, a background literature review of eating disorder programs and treatment interventions is provided including available evidence on physical, psychiatric, and other eating disorder treatment interventions, along with perceptions of health care providers, and perceptions of patients receiving treatment in eating disorder programs. The rationale for conducting the mixed studies systematic review is also discussed in Chapter 2.

In Chapter 3, the mixed studies systematic review methods are detailed. Decisions resulting in included studies and the subsequent categorization are also described followed by the process used to critically appraise studies to assess quality.

In Chapter 4, the assessment of study quality of selected studies, organized by study type, is presented.

In Chapter 5, specific findings from the selected studies are detailed followed by a synthesis across studies of each treatment intervention, healthcare provider practice along with caregiver and patient perspectives on inpatient eating disorder treatment programs. A summary of main findings and recommendations along with the scope of future work are also included.



## **Chapter 2 Background Literature Review**

In adolescents, eating disorders present life-threatening conditions that disrupt physical, emotional, and behavioural growth and development (Robin, Gilroy, & Dennis, 1998). Thus, effective treatment plans are crucial to recovery. However, the complex evolution of eating disorders makes treatment on an inpatient hospital setting challenging. To establish evidence-based treatment plans, an understanding of current methods and their effectiveness is necessary. This background literature review summarizes available evidence on effective inpatient eating disorders treatment to identify what has previously been studied, while identifying gaps in the current body of research. Information was collected from databases (i.e., CINAHL, PsycINFO) relevant to this topic with a specific focus on nursing and health care literature. In this chapter, I first identify the structure of inpatient eating disorders programs, then discuss the effectiveness of medical, psychiatric, and other interventions respectively. Next, I discuss perceptions of health care providers and patients related to inpatient eating disorders treatment and then provide rationale for a mixed studies systematic review to understand gaps in current knowledge towards identifying most effective interventions and practices on adolescent inpatient eating disorder programs.

### **Inpatient Eating Disorder Programs**

Historically, inpatient eating disorder programs involved what was understood to be a coercive approach to treatment by healthcare providers focusing primarily on weight restoration and normalization of eating behaviours using behavioural change methods of rewards and punishments (Vandereycken, 1985). However, with an increase in the number of patients diagnosed with eating disorders, a shift from individual treatment with a primary focus on weight gain to group treatment in a multidisciplinary, structured therapeutic milieu environment has

been recognized as more efficient and effective from both patient, nursing, and program treatment perspectives (Halmi, 2009; Robin et al., 1998; Vandereycken, 1985). Inpatient treatment approaches involved a high level of structure and scheduling of supervised meals along with individual, group, and family therapy (Cummings et al., 2001). After confirmation of an eating disorder diagnosis, inpatient programs included information and education for the patient and family. For the patient, a refeeding plan was initiated to gradually increase daily caloric intake until steady weight gain was achieved. Psychiatric and other interventions were subsequently introduced to further modify eating disordered behaviour and to enable insight into the underlying issues contributing to the eating disorder (Robin et al., 1998). An agreement between the patient and health care provider that outlined the goals of inpatient treatment and the criteria for discharge inclusive of nutritional rehabilitation, structured eating behaviours and attitudes, and progress in psychiatric recovery was individually established and signed during admission (Robin et al., 1998; Vandereycken, 1985). Ideally, patients remained in the inpatient eating disorder program until they reached 85% to 90% of their ideal body weight, they were eating regularly and gaining weight consistently as per their growth chart, and their parents were provided sufficient information and training to support their child/adolescent after discharge (Robin et al., 1998).

With inpatient eating disorder programs being significantly more expensive than any other form of care, 30% to 50% of patients have been found to relapse after discharge and require readmission to an inpatient program (Peake, Limbert, & Whitehead, 2005). Eating disorder program and treatment effectiveness is fundamental to achieving remission and decreasing hospitalization costs. To date, there is a lack of research evidence available to evaluate the effectiveness of inpatient eating disorder programs and to explain eating disorder

relapse (Bergh, Brodin, Lindberg, & Sodersten, 2002; Collin, Power, Karatzias, Grierson, & Yellowlees, 2010; Hay, 2004; Naab et al., 2013; Robin et al., 1998). Even when patients complete evidence-based eating disorder treatment programs, many do not achieve full remission. There is also little information on how to develop eating disorders programs nor eating disorders treatment guidelines that span the continuum of care for this patient population (Cummings et al., 2001). In fact, longitudinal research suggests that adolescent patients will continue to engage in unhealthy eating behaviors throughout young adulthood post-discharge from inpatient treatment, leading to an increase in symptoms and thereby leading to a relapse (Ciao, Loth, & Neumark-Sztainer, 2014). It is important to identify which inpatient programs and specific treatment interventions are effective to help prevent eating disorder relapse and progression to a chronic condition (Ciao et al., 2014; Naab et al., 2013).

Up to 13% of young women and four percent of young men have been affected by eating disorders such as, anorexia nervosa, bulimia nervosa, binge eating disorder, and eating disorder not otherwise specified (Ciao et al., 2014). Treatment on an inpatient eating disorders program has been found to be crucial to recovery, as two thirds of patients diagnosed with eating disorders require inpatient treatment at least once during the course of their illness (Naab et al., 2013). The treatment goals of a typical inpatient eating disorder program include medical stabilization, weight restoration, and psychosocial recovery (Collin et al., 2010; Naab et al., 2013). Typically, inpatient eating disorder programs involve a multidisciplinary approach to treatment, where treatment providers include physicians, psychologists or psychiatrists (or both), social workers, nutritionists, dieticians, and nurses including advanced practice nurses. Within the eating disorder program, treatments provided include nutritional counselling and supervised meals combined with individual and group psychotherapy in addition to medical care

(Cummings et al., 2001; Halmi, 2009; Hay et al., 2013; Naab et al., 2013). Each member of the multidisciplinary team contributes to treatment in an eating disorders program. In the following section, a closer examination of the effectiveness of common eating disorder treatment interventions and practices implemented by multidisciplinary health professionals enables an understanding of the overall efficacy of eating disorders programs.

### **Interventions targeting physical consequences of eating disorders.**

Eating disorders affect multiple systems in the human body concurrently including endocrine, cardiac, renal, gastro-intestinal, reproductive, and immune systems (Hay, 2004). As stated earlier, the initial treatment goal for inpatient eating disorder programs is to restore healthy body weight and eating behaviours as newly admitted children and adolescents present as severely malnourished and underweight thus causing medical instability (Barton & Nicholls, 2008; Cahill, 1994; S. Gowers et al., 2007; Lock & Gowers, 2005). Initial inpatient treatment interventions are aimed at promoting healthy adolescent growth and development indicated by individually calculated growth charts normed on an adolescent population. Inpatient treatment emphasizes the importance of immediate physical management of eating disorders symptoms and ongoing monitoring to manage and avoid physical complications resulting from the malnourished state of the patients (Barton & Nicholls, 2008; Gowers & Bryant-Waugh, 2004). Physical management focuses on weight restoration, nutritional rehabilitation, rehydration, and correction of serum electrolytes (Gowers & Bryant-Waugh, 2004; Halmi, 2009). Monitoring orthostatic vital signs, blood work, cardiac status, and medication administration is also involved. Baseline and repeated assessments are essential along with bedrest to facilitate recovery (Halmi, 2009; Hay, 2004; Vandereycken, 1985). However, one limitation of standardized assessment tools utilized for assessing eating disorder psychopathology is insufficient psychometric

properties specific to adolescents (Gowers & Bryant-Waugh, 2004). Other specific inpatient interventions primarily performed by nurses include regular monitoring of vital signs, weight and dietary intake, and fluid intake and output levels (Hay, 2004); however, there are no consistent guidelines on the frequency or ranges to be considered for such monitoring. Similarly, although nutrient intake in the form of a high caloric diet is indicated upon admission on an inpatient program (Halimi, 2009; Hay, 2004) there is no consensus on safe ranges to avoid complications.

Complications include (but are not limited to) electrolyte imbalances, vitamin deficiency, osteopenia, along with cardiac abnormalities (Gowers & Bryant-Waugh, 2004). Physical complications in younger patients can occur before the evidence of significant weight loss (Gowers & Bryant-Waugh, 2004). One of the most common complications in treating malnourished young patients is refeeding syndrome, which is described as severe metabolic disturbances that occur because of resuming nutrition in individuals after a prolonged period of starvation and/or abnormal eating habits. Care is provided by regular monitoring of heart rate, orthostatic vital signs, and serum electrolytes. Refeeding practice guidelines for the management of eating disorder symptoms in children and adolescents are inconsistent in rates and types of refeeding regimes, along with weight goals during inpatient treatment (Lock & Gowers, 2005). Similarly, Barton and Nicholls (2008) found that assessment protocols meant to manage the physical and metabolic states of patients also varied considerably. There are considerable knowledge gaps around the treatment of eating disorders, specifically in the promotion of healthy adolescent growth and development and the physical management of eating disorder symptoms and complications (Gowers & Bryant-Waugh, 2004). Lock and Gowers (2005) reported that knowledge gaps are due to the research evidence being based on expert clinical opinions of eating disorder clinicians and/or cohort studies rather than randomized controlled trials. The

inconsistencies and gaps in the literature result in inadequate evidence-based treatment protocols with varying lengths of hospitalization and increased burden on the healthcare system.

Medications for physical and psychiatric co-morbidities are also commonly used on inpatient eating disorders treatment (Hay et al., 2013). Several types of medications are used in the treatment of eating disorders depending on the type of eating disorder, with antipsychotics and selective serotonin reuptake inhibitors (SSRIs) being the most common (Bailey et al., 2014; Gowers & Bryant-Waugh, 2004). The use of antipsychotics and SSRIs has been identified to be most effective for inpatients diagnosed with anorexia nervosa, while the use of antidepressants have been found to be the most effective for inpatients with bulimia nervosa (Bailey et al., 2014; Gowers & Bryant-Waugh, 2004). Additionally, the use of other types of medications, such as, anti-emetics and multivitamins were also found to be effective in the medical treatment of eating disorders (Gowers & Bryant-Waugh, 2004). However, it is recommended that the regular use of medications is not justified in the management of eating disorders as it should be reserved for severe and complicated cases with coexisting comorbidities such as, depression, anxiety, and obsessive compulsive disorder as they are most useful in such complex co-morbid presentations of eating disorders (Gowers & Bryant-Waugh, 2004). In contrast, the evidence map compiled by Bailey et al. (2014) used findings from a rigorous systematic search and in-depth synthesis of research literature recommended the use of medications as a common practice in eating disorders treatment. The use of antipsychotics for anorexia nervosa, and tricyclic antidepressants and SSRIs for bulimia nervosa are the most investigated, while the evidence on use of medications for binge eating disorder and eating disorder not otherwise specified is almost non-existent. Gowers and Bryant-Waugh (2004) noted a lack of evidence on the use of various medications in the management of physical symptoms of eating disorder, such as, multivitamins for vitamin

deficiencies, gastroprokinetics to improve gastric motility during the re-introduction of normal eating amounts, antidepressants to manage bulimic symptoms, anti-emetics to reduce bingeing and purging behaviours, along with benzodiazepines to help reduce eating-related anxiety. They also acknowledge the challenges of investigating the effectiveness of medications in eating disorder treatment due to the unwanted and unknown effects on physically compromised individuals. Further, much of the research related to the use of medications in treatment of eating disorder is focused on enhancing weight gain rather than managing the psychiatric aspects of eating disorders for improved long-term health. As such, evidence on the use of medications in the treatment of eating disorders is variable.

Inpatient medical care also incorporates the management of physical aspects of eating disorders by physicians and nurses (Hay et al., 2013) The initial complete physical examination is conducted by a primary care physician (Halmi, 2009), while a dietician creates a treatment plan for appropriate nutritional rehabilitation and provides nutritional counselling throughout inpatient treatment (Halmi, 2009). Service is centered around crisis stabilization and acute symptom reduction where nursing staff aggressively monitor and support patients and families (Cummings et al., 2001).

### **Interventions targeting psychological aspects of eating disorders.**

Psychological interventions for eating disorders have been identified as the most common method for inpatient treatment (Bailey et al., 2014; Breiner, 2003; Nishizono-Maher et al., 2011). They are known to be effective in eating disorders treatment as they address psychological and social factors involved in the onset and maintenance of the eating disorders (Costa & Melnik, 2016). In inpatient eating disorders programs, psychological interventions include (but are not limited to) family-based therapies, cognitive behaviour therapies, and nutritional counselling.

Family based treatment (FBT) based on the Maudsley Model is the most frequently used intervention (Bailey et al., 2014; Lock & Gowers, 2005). This approach focuses on the familial management of anorexia nervosa symptoms and consequences for the individual and for family dynamics. This model forefronts the family environment of the children and adolescents diagnosed with an eating disorder, where the parents are the main source of support as they sustain the task of re-introducing nutrition to their child while preventing severe dieting, purging, over exercising, and other related behaviors of anorexia nervosa (Lock & Gowers, 2005). A basic premise of FBT is that therapists consult with parents to empower and encourage them towards an increased sense of self-efficacy where treatment depends on the leverage that parents have with their children to effect behaviour change towards eating and weight gain for patients (Gowers & Bryant-Waugh, 2004; Lock & Gowers, 2005). Twelve clinical trials with small sample sizes evaluated by Bailey et al. (2014), indicated that FBT was generally effective as at least half of the adolescents who received the intervention achieved remission.

FBT has the strongest evidence for treating pediatric patients with eating disorders; in fact, it is recommended in several guidelines (Couturier et al., 2015; Couturier, Kimber, & Szatmari, 2013; Hay et al., 2013; Månsson, Parling, & Swenne, 2016). FBT has the potential to reduce inpatient treatment costs by up to 70% through a reduction in rehospitalizations from its positive effects (Couturier et al., 2015). This intervention is focused on the behavioural change around the concept of eating to promote weight gain for patients with anorexia nervosa (Couturier, Kimber, & Szatmari, 2013; Espie & Eisler, 2015; Gowers & Bryant-Waugh, 2004; Lock & Gowers, 2005). The use of FBT in inpatient eating disorders programs enables parents and caregivers to learn more about eating disorders as a family, and to support their adolescent to overcome the eating disorder, while reinforcing the parental role as experts in their child's care



and the primary source of support post discharge from the inpatient program (Barton & Nicholls, 2008; Lock & Gowers, 2005).

The most commonly used FBT model for adolescent anorexia nervosa is based on the Maudsley approach, however the evidence for FBT based on the Maudsley approach is limited (Bailey et al., 2014; Gowers & Bryant-Waugh, 2004; Robin et al., 1998). Lock and Gowers (2005) demonstrated this in comparisons to FBT based on the Maudsley model with separate family therapy (where the individual and the families are seen in separate sessions by the therapist) and individual therapy. They concluded that FBT based on the Maudsley model was favoured because of larger weight gain (greater than 85% of body weight at admission) and body mass index (greater than 17.5) at the end of treatment. FBT in general also appeared to be effective for younger adolescents aged 12 to 18 years of age; however, these findings are from 12 clinical trials with small sample sizes, where the risk of sampling bias was evident (Bailey et al., 2014). Recommendations for the use of FBT across the different types of eating disorders is variable from highly effective to not effective at all. Most of the FBT effectiveness evidence has been related to families with an adolescent diagnosed with anorexia nervosa. As a result, the effectiveness of FBT in adolescents diagnosed with anorexia nervosa has led to the creation of intensive FBT approaches involving multiple family group therapies with clear practice guidelines in an effort to improve and create better versions of this treatment towards effective outcomes (Gowers & Bryant-Waugh, 2004).

Although FBT effectiveness has been indicated for adolescents with anorexia nervosa, evidence supporting its applicability for other eating disorder diagnoses, such as bulimia nervosa, binge eating disorder, and eating disorder not otherwise specified, is insufficient. In their evidence map, Bailey et al. (2014) identified two randomized controlled trials investigating the use of FBT

in individuals diagnosed with bulimia nervosa; the first trial found higher remission rates for FBT versus individual therapy post-treatment and at six months follow up, while the second trial found higher abstinence of bingeing behaviours for FBT versus cognitive behavioural therapy guided self-care at post-treatment. Thus, studies evaluating the effectiveness of FBT for adolescents diagnosed with bulimia nervosa are limited; therefore, further investigation regarding the effectiveness of FBT for bulimia nervosa is required in order to make stronger recommendations for practice (Bailey et al., 2014; Gowers & Bryant-Waugh, 2004). This is also the case for binge eating disorder and eating disorder not otherwise specified (Bailey et al., 2014).

The decision to use FBT or another intervention is made individually based on the presenting symptoms as each individual presents differently. Individual psychological therapies are interventions that are recommended for adolescents with anorexia nervosa with the aim to improve self-efficacy, self-esteem, and self-mastery as an avenue to ameliorate anorexia nervosa symptoms. Adolescents who develop anorexia nervosa struggle with the developmental stage of adolescence and focus on perfecting and controlling their weight and shape (Lock & Gowers, 2005). Examples of individual psychotherapies include, cognitive behaviour therapy (CBT) and interpersonal psychotherapy. CBT aims to change distorted cognitions and resulting behaviours related to body shape and weight in anorexia nervosa (Lock & Gowers, 2005). It is also considered one of the main treatments for eating disorders (Costa & Melnik, 2016; Dunn, Neighbors, & Larimer, 2006). CBT is a multimodal approach that includes nutritional counselling, psychoeducation, self-monitoring, along with cognitive and behavioural interventions (Costa & Melnik, 2016). It focuses on using cognitive restructuring to modify distorted beliefs and attitudes about the meaning of weight, shape, and appearance which are the

underlying factors of eating disorders (Costa & Melnik, 2016; Robin et al., 1998). Strong evidence suggests its effectiveness in the treatment of adolescents with bulimia nervosa and binge eating disorder (Costa & Melnik, 2016; Linardon, Brennan, & de la Piedad Garcia, 2016) but minimal effectiveness is reported in other types of eating disorders such as anorexia nervosa and eating disorder not otherwise specified. Gowers and Bryant-Waugh (2004) identified more than 30 randomized controlled trials and concluded that CBT focusing on modifying abnormal eating behaviours along with weight and shape related cognitions were the most effective treatment for bulimia nervosa among adolescents. They specify that the ideal treatment protocol for CBT for bulimia nervosa should be approximately 20 weekly treatment sessions as per the 30 randomized controlled trials reviewed, where complete remission was achieved in about 40% of the cases (Gowers & Bryant-Waugh, 2004). However, the use of CBT in anorexia nervosa is only minimally effective, specifically regarding symptom management, such as body image disturbance. Similarly, there is also a lack of evidence demonstrating the effectiveness of CBT in eating disorder not otherwise specified.

Interpersonal psychotherapy, on the other hand, aims to help individuals address and manage interpersonal challenges associated with the onset, development, and maintenance of their eating disorder (Gowers & Bryant-Waugh, 2004). Comparatively, although evidence suggests that CBT produces more rapid remission and reduces symptoms in bulimia nervosa, three studies indicated that interpersonal therapy demonstrated the same efficacy in the long term (with follow up at eight to 12 months) as CBT (Gowers & Bryant-Waugh, 2004). Gowers and Bryant-Waugh (2004) cited one study specifically suggesting that individuals with bulimia nervosa found interpersonal therapy more appropriate than CBT and therefore experienced more success with it in terms of their difficulties managing bingeing and purging behaviours. However,

there is little evidence supporting the use of interpersonal therapy in adolescents with anorexia nervosa, binge eating disorder, and eating disorder not otherwise specified.

Nutritional counselling as an individual therapy is also effective in the inpatient treatment of anorexia nervosa; however, its applicability to adolescents is limited (Gowers & Bryant-Waugh, 2004; Lock & Gowers, 2005). Nutritional counselling involves primarily an educational model that is adjunctively used in the treatment of eating disorders. In studies where nutritional counselling has been used as a comparison to other treatments; such as, CBT, participants have not responded well to nutritional counselling as an intervention on its own, which is why it is recommended as an adjunct intervention (Gowers & Bryant-Waugh, 2004; Lock & Gowers, 2005). It has been reported to be effective in the inpatient treatment of anorexia nervosa; however, its applicability to the adolescent population is limited as no systematic data regarding effectiveness is available (Gowers & Bryant-Waugh, 2004; Lock & Gowers, 2005; Nishizono-Maher et al., 2011). Overall, Gowers and Bryant-Waugh (2004) report that although there are a considerable number of studies investigating psychological therapies in eating disorders, there are many methodological issues such as heterogeneity within therapies of the same name, a range of outcome measures, differences in timing of follow-up, inconsistencies in entry criteria, and variability in other concurrent therapies that make it difficult to synthesize the results in a rigorous, valid meta-analysis. Given the current evidence gaps in understanding effectiveness of psychological therapies for children and adolescents with eating disorders, further research investigating the most effective psychological interventions for inpatient eating disorders treatment to improve outcomes for adolescents with eating disorders is warranted. Therefore, further research to identify the most effective psychological interventions in inpatient eating disorders treatment is needed.

### **Other interventions involved in eating disorder treatment.**

Various other treatment approaches have also been implemented concurrently with medical and psychological interventions during inpatient treatment of eating disorders. There is growing evidence towards the effectiveness of mindfulness-based interventions in eating disorders treatment (O'Reilly, Cook, Spruijt-Metz, & Black, 2014; Wanden-Berghe, Sanz-Valero, & Wanden-Berghe, 2010). In combination with the development of emotion regulation and distress tolerance skills, mindfulness-based interventions have proven to be effective in the management of binge eating. As a result, there is growing interest in its application for other types of eating disorders, such as, anorexia nervosa and bulimia nervosa (Wanden-Berghe et al., 2010). However, empirical evidence regarding their effectiveness is yet to be established (O'Reilly et al., 2014; Wanden-Berghe et al., 2010).

The difficulty in managing eating disorder symptoms within an inpatient program is apparent. Poor treatment compliance and refusal has been found to be associated with therapeutic approaches that attempt to reduce eating disorder symptoms and behaviours in patients who are not ready to change (Dean, Touyz, Rieger, & Thornton, 2008). Social support has been noted to be associated with eating disorder symptomology, where individuals with low levels of social support are perceived to present with more eating disorder symptoms (Wonderlich-Tierney & Vander Wal, 2010). Similarly, poor social relationships have also been associated with higher bulimic and bingeing and purging symptoms (Wonderlich-Tierney & Vander Wal, 2010). Motivational enhancement therapy aims to support these patients reach their own, change-orientated conclusions (Dean et al., 2008; Dunn et al., 2006). Along with an influence on patients' motivation to change and actively participate in treatment, motivational enhancement therapy has shown to reduce bingeing, vomiting, and laxative use for patients diagnosed with

bulimia nervosa (Dunn et al., 2006). However, despite its applicability to eating disorders treatment on an inpatient setting, there is a lack of studies examining its effectiveness (Dean et al., 2008; Dunn et al., 2006).

### **Perceptions of inpatient treatment programs**

The detrimental effects of eating disorders impact not only patients and their families, but also health care providers involved in their treatment. As such, along with patients, the perceptions of health care providers involved in treatment are crucial to understanding the challenges of current treatment methods.

#### **Perspectives of health care providers.**

The complex nature of eating disorders makes it imperative that patients receive effective treatment by experienced and competent health care providers (Reid et al., 2010; The National Institute for Health and Care Excellence, 2004). However, health care providers feel that patients' lack of readiness to change, resistance, nature of illness, and managing personal negative affect were challenging factors to address in their practice with this patient population (Thompson-Brenner, Satir, Franko, & Herzog, 2012). On the other hand, experienced health care providers did not find patients with eating disorders difficult to work with, but rather found it difficult to successfully treat patients diagnosed with eating disorders due to limited resources (Thompson-Brenner et al., 2012).

Engaging in treatment with patients diagnosed with eating disorders also affects health care providers personally, specifically, their attitudes towards self. Health care providers report adopting healthier eating choices with positive changes in body image along with an increased awareness of their physical condition and appearance (Shisslak, Gray, & Crago, 1989; Thompson-Brenner et al., 2012). Nurses on an inpatient program treating eating disorders

reported having fewer distorted attitudes towards eating compared to nurses on general medical units (Thompson-Brenner et al., 2012). Overall, health care providers reported an increase in psychological-mindedness, self-awareness, and self-assurance as a result of working with this patient population (Shisslak et al., 1989). Additionally, Thompson-Brenner, Satir, Franko, and Herzog (2012) reported that the reactions of health care providers working with patients diagnosed with eating disorders appear to vary in accordance to the perception of the patients' response to treatment. It is apparent that there are a variety of feelings and attitudes health care providers perceive when working with this patient population. As treatment is delivered by health care providers, it is imperative to understand how health care provider perceptions affect treatment delivery and effectiveness overall.

### **Perspectives of patients.**

When evaluating the effectiveness of inpatient eating disorders treatment, the perspectives of patients is seldom considered (Le Grange & Gelman, 1998). The patient perspective is important when determining improvements in current treatment plans as it informs the therapeutic process and provides a holistic understanding of recovery. Patients have reported that learning new and effective coping mechanisms are beneficial strategies in their treatment (Le Grange & Gelman, 1998). Being treated in a supportive environment, where health care providers viewed patients as unique individuals rather than as their diagnosis was also found to be helpful (Colton & Pistrang, 2004; Le Grange & Gelman, 1998). Interestingly, being on an inpatient treatment program, where patients are living with other individuals with same or similar diagnoses was found to have both positive and negative impacts. Relating to one another was valuable in terms of peer support but caused increased distress for patients as they found themselves competing with one another on who had the most severe medical and psychological

consequences of the eating disorder. This resulted in patients surrendering to their eating disorder instead of overcoming it (Colton & Pistrang, 2004). Although patient perspectives of eating disorders treatment are identified, its generalizability towards specific interventions along with patient satisfaction are unknown.

The current gap in the research on eating disorders treatments for adolescents is not a new problem (Attia, Marcus, Walsh, & Guarda, 2017). Currently, there is insufficient research evidence detailing essential components of inpatient care for this patient population (Attia et al., 2017), resulting in a lack of consistency on best practices for medical, nursing, and psychiatric treatment of adolescents with severe eating disorders in Canada (Norris et al., 2013). The absence of sufficient evidence supporting standardized treatment practices and interventions is largely due to differing methodologies across studies, lack of uniformity in outcome measures, and sparse rigorous follow-up assessments in existing research studies (Attia et al., 2017). Given the severity and consequences of eating disorders along with the high cost of treatments, there is a need for more information about what treatment interventions and practices work well with positive patient outcomes.

### **Purpose of Thesis**

As eating disorders are life threatening illnesses that can require long lengths of hospital stay, development of comprehensive programs for adolescents require a variety of evidence-based treatment components (Cummings et al., 2001). To date, the evidence on effective eating disorders programs is lacking, specifically lacking in relation to interventions and specific practices implemented on inpatient eating disorders programs. To address this research gap, I posed the research question: What is the current research evidence on the most effective program and treatment intervention components of adolescent inpatient eating disorder programs?



This mixed studies systematic review consists of findings from quantitative, qualitative, and mixed methods studies. Evidence was synthesized to identify relevant trends among treatment interventions and practices, while highlighting important gaps and challenges in adolescent inpatient eating disorders treatment towards improved research knowledge (Booth, Sutton, & Papaioannou, 2016).

As a Master of Nursing student, I considered a mixed studies systematic review as appropriate for exploratory work where what is known about a topic together with any research evidence gaps could be identified. The mixed studies systematic review could also allow for evaluation of the effectiveness of eating disorder programs and specific treatment interventions thus contributing towards evidence-based practice standards for adolescent inpatient eating disorder programs. By critically appraising research studies that examined the efficacy of interventions and practices specific to an inpatient eating disorder programs, the most effective interventions and practices for adolescents diagnosed with eating disorders could be identified. In addition, the mixed studies systematic review results are relevant to the field of nursing. Specifically, towards the evolution of knowledge for nursing practice – for best nursing practices, policies, and nursing education, as well as potentially for multidisciplinary team practices and policies in the area of inpatient eating disorder programs and treatment interventions. The mixed studies systematic review results could contribute to furthering evidence-based nursing and health care practices targeting the complexity of adolescent eating disorders. In the next chapter, mixed studies systematic review method is detailed.

### **Chapter 3 Methods**

A mixed studies systematic review following guidelines from the Centre for Reviews and Dissemination (CRD) was conducted to evaluate the effectiveness of inpatient eating disorder programs and interventions in keeping with the research question: What is the current research evidence on the most effective program and treatment intervention components of adolescent inpatient eating disorder programs? . The CRD is a world renowned institute that specialises in evidence synthesis and high quality systematic reviews. It is especially relevant for those with an understanding of health research who wish to advance the use of research evidence in decision-making to improve overall health.

A mixed studies systematic review involves systematic and explicit steps to collect, identify, select, critically appraise, and analyze relevant research from both qualitative and quantitative studies (Booth et al., 2016). It ensures identification of relevant studies with both qualitative and quantitative results to answer the research question. A mixed studies systematic review includes systematic approaches towards:

- comprehensive searching resulting in relevant studies
- critical appraisal of individual studies
- synthesis and analysis of individual studies
- presentation of review findings (Booth et al., 2016).

Each approach is driven by the research question such that the research question becomes the driving force behind mixed studies reviews. A mixed studies systematic review can inform decision makers on whether findings can be applied to specific subgroups of a population, namely in the case of this study, adolescents diagnosed with eating disorders and effectiveness of

inpatient programs (Booth et al., 2016). Mixed studies reviews have been found to be useful in integrating qualitative and quantitative findings on effectiveness and developments in intervention research so as to complement each other when addressing the research question (Polit & Beck, 2017). Specifically, this mixed studies systematic review design integrated findings from studies that were grouped not by method alone but by findings assessed as answering the same research question (Polit & Beck, 2017) targeting effectiveness of adolescent inpatient eating disorders treatment. The inclusion of quantitative studies allowed determination of the effectiveness of inpatient interventions supported by the objective measurable data from such studies; such as, length of hospitalization, symptom management, and recovery. At the same time, the inclusion of qualitative studies revealed evidence on experiences of patients, families, and health care providers involved in adolescent eating disorders treatment. Together, both quantitative and qualitative study findings contributed towards a more holistic understanding of adolescent inpatient eating disorders treatment. As such, a configurative and interpretative approach was taken for the review, where the qualitative studies support and inform the quantitative studies towards an integrated synthesis and overall understanding of effectiveness within eating disorder interventions and practices (Booth et al., 2016).

### **Mixed Studies Systematic Review Method**

#### **Search strategy.**

Five databases were searched. OVID databases included: MEDLINE (R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily, Embase, and PsycINFO. EbscoHost databases included CINAHL and ERIC. Details of the search strategy for each database are outlined in Tables 1.7 to 2.1 in Appendix C. Only English language studies were included as this is the only language I am familiar with. The search strategy included three

concepts with relevant keywords and appropriate subject headings per individual database, namely: (a) inpatient psychiatric unit, (b) adolescents, and (c) eating disorders.

The inclusion criteria consisted of adolescents aged nine to 21 years of age, hospitalized on an inpatient psychiatric unit, and diagnosed as per the Diagnostic and Statistical Manual of Mental Disorders – IV and V (DSM-IV and DSM-V), International Classification of Diseases, Ninth Revision (ICD-9), and the International Classification of Diseases, Tenth Revision (ICD-10). Although interventions were tailored individually towards children, adolescents, and young adults, the focus of this review was adolescents. As such, in keeping with the research question, the focus of the review target was inpatient eating disorder interventions for adolescents aged nine to 21 years inclusive of caregivers as informal supports.

Age distinctions between adolescents and young adults appear blurred in treatment programs, as well as in the literature. Adolescence refers to the period from childhood to adulthood (Government of Canada, 2011; World Health Organization, 1986) typically spanning from 12 to 18 years of age (Jaworska & MacQueen, 2015). In Canada, early adolescence spans from 12 to 14 years, mid-adolescence spans from 15 to 17 years, while late adolescence spans from 18 to 21 years (Government of Canada, 2011). The World Health Organization (1986) on the other hand defines adolescents as individuals aged between 10 to 24 years, which is a broad age range. Health care professionals involved in the care of adolescents often deal with such wide age ranges between adolescence and adulthood, which vary from province to province and between jurisdictions within a province (Canadian Pediatric Society, 2016). While adolescence is an important developmental stage, its end limit is not always easily distinguishable, which poses a risk for health care professionals when adolescent patients require care in settings with restrictive age limits (Canadian Pediatric Society, 2016). As such, it has been suggested that

adolescence should be conceptualized as a developmental period rather than a temporal snapshot as it is highly variable behaviourally and developmentally (Jaworska & MacQueen, 2015).

Further, the Canadian Paediatric Society believes that the definition of adolescence based solely on chronological age is unjustified and impractical and therefore favours a definition based on biopsychosocial readiness of young people to enter adulthood (Canadian Pediatric Society, 2016).

It is recommended that those responsible for providing care to adolescents should be provided enough flexibility in this age span to encompass special situations such as young people with chronic conditions (i.e., eating disorders) leading to delayed development or prolonged dependency (Canadian Pediatric Society, 2016). For the purpose of my study, the rationale for identifying adolescents as aged nine to 21 years relates also to my experience as a Registered Nurse with individuals being admitted to inpatient eating disorder units within this age range. It is important to note that patients younger than 13 years, while considered pre-adolescent, are categorized as adolescents in this study. This is because in my experience, an increase in the number of pre-adolescents (aged nine to 12 years of age) being diagnosed and admitted with eating disorders on an inpatient program has been noted, thereby categorizing them as a high-risk individual (Mental Health and Spiritual Health Care, 2006). The same inpatient interventions are applied in their care as adolescents in the program. Therefore, in this study, an adolescent is defined as an individual in the age range of nine to 21 years to ensure studies' results included a broad age range of patients where findings were generalizable to current eating disorder inpatient practice environments. Detailed inclusion and exclusion criteria are outlined in Table 1.5 and 1.6 in Appendix B.

The decisions relating to database selection, development of the search strategy, along with the inclusion and exclusion criteria were made in consultation with a health sciences librarian (KAH) and two experts from the field of nursing (CE and KB) to obtain a higher level of conceptual advice. Keywords and subject headings were reviewed. A draft search was developed in PsycINFO and subsequently reviewed including determining whether seed articles were captured in order to inform the final search strategy. Two rounds of searches were completed. The pilot search was conducted in July 2017 where the inclusion and exclusion criteria were explored by the two content experts (CE and KB). The pilot search was conducted to assess the type and range of literature on effective eating disorder inpatient treatment components and to refine inclusion and exclusion criteria. After refinement of search terms and inclusion and exclusion criteria, a final systematic search was conducted in May 2018. Details of the inclusion and exclusion from the pilot search can be found in Table 1.5 followed by the refined inclusion criteria used in the final systematic search in Table 1.6 (Appendix B). The final search was conducted to only include studies from 2013 to 2017 to identify the most current literature relevant to answering the research question.

### **Pilot search.**

Articles from each database search were exported into respective folders in the reference management program EndNote. The search yielded 6434 records after de-duplication. Study characteristics (i.e., author, year, title, abstract, name of database, and reference type) were exported to an Excel spreadsheet for review. From an initial screen of title and reference type by the first reviewer (SP), 1532 records resulted. Any titles not discussing interventions on an inpatient setting (i.e., internet-based interventions, residential treatment, outpatient treatment) were excluded. Titles with the words “adult” or “women” were also excluded. Titles discussing

the relationship of various plasma levels (i.e., homocysteine) or genotypes (i.e., catecholamine-O-methyltransferase and 5-HTTLPR) in relation to eating disorder symptomology or behaviour were excluded as evidence about effectiveness with inpatient treatment of eating disorders was inconclusive.

From the 1532 selected records, a title and abstract review was independently completed by two reviewers (SP and CE) with an inter-rater reliability of 58% resulting in re-assessment of the inclusion criteria. As initial inclusion criteria were broad, a number of review discrepancies occurred. For example, whether an abstract discussing young adults or women without a specific age range be included. Similarly, studies involving eating disorder diagnoses using older versions of the Diagnostic and Statistical Manual of Mental Disorders (DSM) led to a plethora of results with many inconsistencies and out-dated findings. As a result, the review publication date limits were re-assessed and set at 2013 to 2017 inclusive, resulting in the most current research using an eating disorder diagnosis of only DSM-V.

Specific parameters around the inclusion criteria of adolescents aged nine to 21 years were also made to include only studies that specified a nine to 21 year age range or used the term ‘adolescent’ specifically. A decision to include studies with a diagnosis of anorexia nervosa, bulimia nervosa, bulimia nervosa, binge eating disorder, and eating disorder not otherwise specified as per the DSM-V, DSM-IV, DSM-IV TR, and International Classification of Diseases 9 or 10 (ICD 9 or ICD 10) was then made as it was recognized that such specifications were too restrictive and would result in elimination of studies relevant to the research question. Also, only studies discussing eating disorders treatment interventions or practices involved in inpatient treatment programs were included. Studies focussing on factors, such as hormonal effects and biophysical effects were excluded. These decisions were made to focus the inclusion and

exclusion criteria on studies relevant to the research question and to meet rigorous systematic review criteria.

### **Systematic search.**

The systematic search of the five databases, namely, MEDLINE (R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily, Embase, PsycINFO, CINAHL, and ERIC. yielded 3462 records, 2389 records after de-duplication. Initially, 50 records randomly chosen using an online random number generator were used to perform inter-rater reliability between two reviewers who screened all records individually. Reviewers independently screened the 50 titles and abstracts, applying the inclusion/exclusion criteria to each record. Review decisions regarding 48 out of the 50 records were consistently made resulting in an inter-rater reliability of 96%. Two records not consistently rated were reviewed again together with rating differences resolved through consensus. The remaining 2389 records were then assessed by both reviewers with a 99% inter-rater reliability rate. Screening resulted in a total of 160 records selected for full-text scan.

### **Full-text screening and review.**

Full-text screening of the 160 articles was completed independently by both reviewers. This resulted in 148 articles consistently assessed with a 92.5% inter-rater reliability rate. The remaining 12 articles were reviewed together for a consensus decision. Full text review of the 160 articles resulted in 52 studies meeting the inclusion criteria. No additional research articles were identified from other sources (i.e., hand searching reference lists of included studies). Of the 52 studies, 39 reported quantitative studies, 10 reported qualitative studies, and two reported mixed methods studies. Of the 52 included studies, 32 focused on interventions while 11 focused on perceptions. Upon closer consideration during data extraction, nine studies discussed factors



involved in inpatient treatment that were not intervention and/or practice specific. These factors were:

- health service
- intolerance of uncertainty
- achieving target weight to predict re-hospitalization
- various predictors, moderators, mediators, and outcomes of readmission
- transitioning home
- inter- and intra-personal factors
- social functioning
- predictive dropout factors
- cost analysis of inpatient anorexia nervosa treatment

Each of the factors was discussed in only one study, therefore a synthesis of findings was not possible to examine program or treatment effectiveness and therefore a decision was made that these ‘factor’ studies did not meet the inclusion criteria. As such, these nine studies were excluded from the overall analysis and synthesis, resulting in 43 included studies. See Figure 1 for the PRISMA diagram.

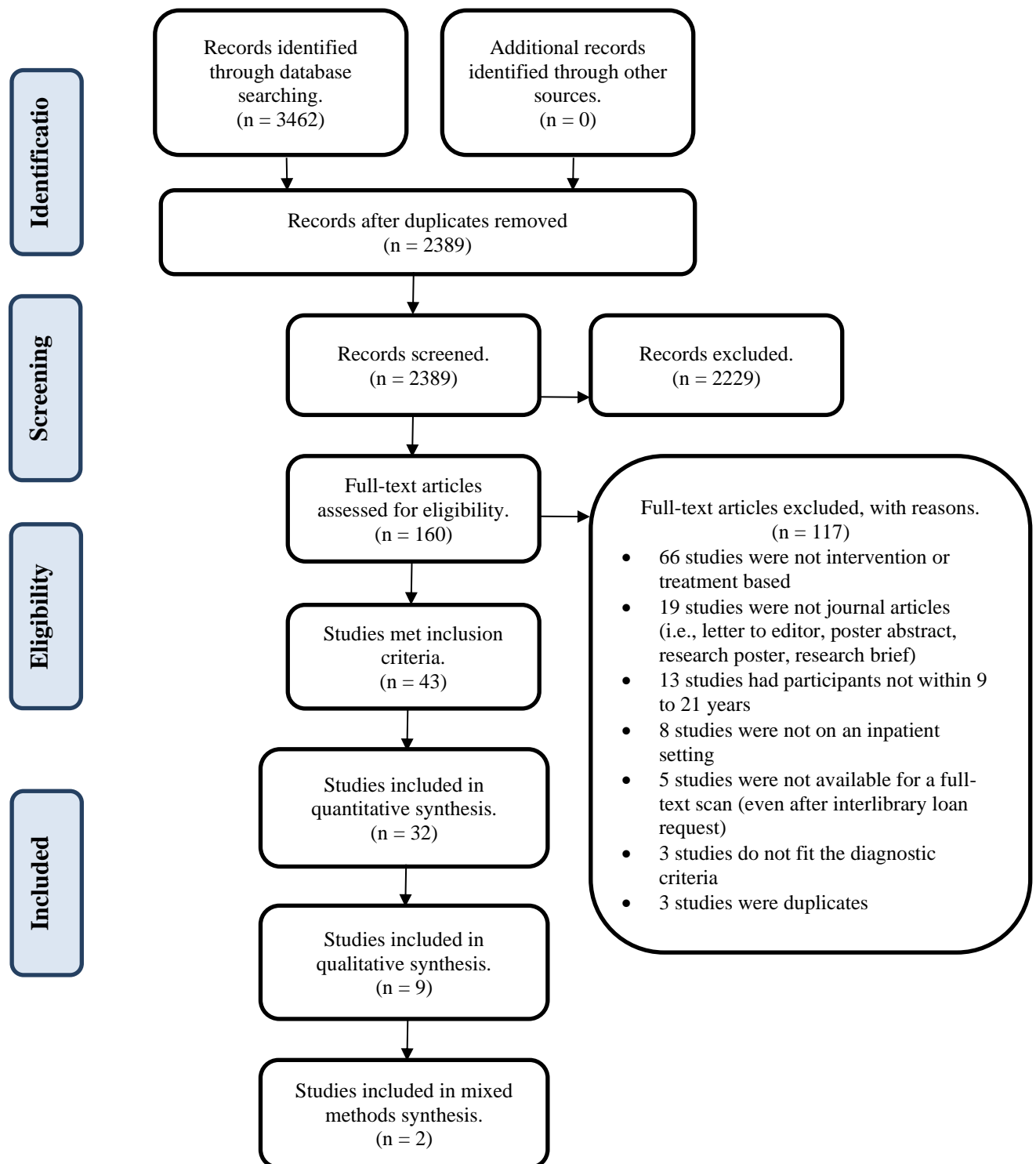


Figure 1. PRISMA diagram

Initially, a title and abstract review by two reviewers (SP and CE) was completed using the inclusion criteria to identify potentially relevant studies answering the research question. Consensus was reached through discussion when discrepancies occurred. Next, a full-text review of selected articles was conducted by both reviewers (SP and CE) with consensus reached through discussion when discrepancies resulted. A total of 126 full-text articles were excluded as they did not meet the inclusion criteria upon review.

Selected studies were then categorized by intervention type and critically appraised based on the type of research design. Data extraction was conducted by the first reviewer (SP) using excel spreadsheets. The extracted data included specific details about the intervention type, population studied, study objectives, study method, study analysis, and outcomes/findings of significance to the research question. Specific attention was made to sample sizes, participant age range, diagnostic criteria, and findings relating to intervention effectiveness.

Sample sizes varied from seven participants to 1,429 participants across studies. Similarly, participants ranged in age from nine to 27 years across studies. Studies that included participants up to 27 years were included as a majority of participants within individual studies were between nine to 21 years. Various statistical tests were also used across studies, such as chi-squared tests, logistic regression, and analysis of variance. There was no consistency in measurement of outcomes across studies. The studies were then organized by study type. See Table 1.0 below (and in Appendix A) for an overview of the included studies.

Table 1.0. *Overview of included studies.*

| Theme               | Study                 | Type                        | Method       | Main Aim & Overall Findings   |
|---------------------|-----------------------|-----------------------------|--------------|---|
| Inpatient treatment | Madden et al. (2015)  | Randomized controlled trial | Quantitative | While comparing the effectiveness of different inpatient treatments in medically unstable adolescents, it was found that a longer initial hospitalization aimed at weight restoration does not reduce the need for hospitalization.   |
|                     | Avnon et al. (2017)   | Cohort study                | Quantitative | With weight restoration being the prime goal of inpatient care and weight-related variables being crucial to relapse prevention, it was found that weight restoration curves are associated with a greater risk for re-hospitalization relative to other weight restoration patterns.   |
|                     | Schlegl et al. (2015) | Cohort study                | Quantitative | To evaluate the clinical significance of treatment outcome and predictors of change in adolescents with anorexia nervosa, it was found that effectiveness of inpatient treatment for adolescents with anorexia nervosa is associated with improvements in primary symptoms such as weight gain, eating disorder symptoms and general psychopathology.         |
|                     | Naab et al. (2013)    | Cohort study                | Quantitative | To obtain additional detailed information about the effectiveness of a specialized multimodal inpatient treatment for adolescents with anorexia nervosa, it was found that such specialized multimodal inpatient treatment results in improvements on a wide range of variables, such as, eating disorder symptoms and general psychopathology of depression. |
|                     | Bergh et al. (2013)   | Cohort study                | Quantitative | To determine effective treatment of eating disorders by looking across various eating disorder programs, it was found that there is no agreement on how to treat the psychiatric symptoms associated with eating disorders, and in fact, standard psychiatric care for anorexia and bulimia is anything but standardized.                                     |

|  |                         |   |               |   |
|--|-------------------------|---|---------------|---|
|  | Zugai et al. (2013)     | Descriptive study   | Qualitative   | To establish how nurses ensure weight gain and a positive inpatient experience for the treatment of adolescents with anorexia nervosa, it was found that there is a preference for nurses to have clear perspectives on how to ensure both weight gain and a positive inpatient experience among adolescents with anorexia nervosa. This study indicates that the process of weight gain may be enhanced when it is combined with the process of therapeutic engagement.  |
|  | Harken et al. (2017)    | Descriptive study   | Qualitative   | While describing perceptions of caring for adolescents with eating disorder among various health care provider, it was found that with appropriate education, training, and specialized multidisciplinary team support, nursing staff enjoy working with adolescents with eating disorders.   |
|  | Basker et al. (2013)    | Descriptive study   | Qualitative   | While analyzing the clinical profile of eating disorders among adolescent patients, this study concluded that a multidisciplinary team approach and family-based therapy form the cornerstones of management for adolescents with eating disorders.   |
|  | Beukers et al. (2015)   | Descriptive study   | Qualitative   | In describing nursing interventions aimed at restoring normal eating behaviour in patients with anorexia nervosa, it was found that a directive attitude aimed at promoting behavioural change with a combination of empathy and understanding is beneficial in treatment. Findings contribute to healthcare professionals training programmes and guidelines by enhancing the knowledge of nursing interventions and attitudes when attempting to restore normal eating behaviour during treatment of adolescent patients with anorexia nervosa. |
|  | Bravender et al. (2017) | Cohort study (Quantitative) and Descriptive study (Qualitative) | Mixed methods | To describe parent and patient impressions of inpatient medical stabilization, it was found that inpatient medical stabilization  |

|                        |                             |                                |              |  |
|------------------------|-----------------------------|--------------------------------|--------------|--|
|                        |                             |                                |              | for adolescent eating behaviours may play an important role in addressing medical complications, while identifying the patient and family's need for ongoing treatment.  |
| Family-based treatment | Lock et al. (2016)          | Randomized parallel comparison | Quantitative | To explore hospitalization use by adolescent anorexia nervosa patients during treatment by examining the process of hospitalization that compared Family-based treatment to Systemic Family Therapy to describe patterns of hospital use, hospital effects on outcome, and predictors and moderators of hospitalization, it was found that there is a difference in timing of hospitalization with family-based treatment compared to systematic family therapy. |
|                        | Dimitropoulos et al. (2018) | Cohort study                   | Quantitative | To assess the feasibility and acceptability of a manualized model of Family-based treatment adapted for transition aged youth, it was found that Family-based treatment adapted for transition aged youth is feasible in specialized paediatric and adult programs and acceptable to study therapists and to transition aged youth and their families.   |
|                        | Halvorsen et al. (2018)     | Cohort study                   | Quantitative | To investigate the naturalistic outcome of inpatient Family-based treatment at a tertiary eating disorder unit for adolescents in terms of weight, eating disorder symptoms, comorbid disorders and treatment received during the follow-up period, it was found that inpatient family-based treatment for patients with anorexia nervosa may be a promising treatment approach but should be investigated further.  |
|                        | Madden et al. (2015)        | Randomized controlled trial    | Quantitative | To determine whether early weight gain in family-based treatment predicted remission at both end of family-based treatment and 12-month follow-up in adolescents with anorexia nervosa, it was found that early weight gain in treatment predicted higher expected body  |

|                               |                          |                             |              |   |
|-------------------------------|--------------------------|-----------------------------|--------------|---|
|                               |                          |                             |              | weight at the end of treatment, which is associated with recovery from anorexia nervosa psychopathology.  |
|                               | Couturier et al. (2013)  | Randomized controlled trial | Qualitative  | To understand the uptake of Family-based treatment for adolescents with anorexia nervosa, the development of context-specific training and administrative processes for the implementation of evidence-based practice and Family-based treatment is warranted.  |
| Cognitive behavioural therapy | DalleGrave et al. (2014) | Cohort study                | Quantitative | To establish immediate and long-term effects of a novel inpatient program for adolescents, it was found that patients maintained the marked improvements in weight, eating disorder psychopathology, and general psychiatric features achieved during treatment when certain aspects of conventional inpatient treatment programs were modified with the aim of improving overall outcomes and reducing relapse at discharge.   |
| Cognitive remediation therapy | Harrison et al. (2018)   | Cohort study                | Quantitative | To enhance the understanding of benefits around Cognitive remediation therapy, it found that a low intensity brief cognitive intervention, which was acceptable to severely unwell individuals with anorexia nervosa could be a useful adjunct to medical stabilisation and provide cognitive skills and a positive experience of engagement with treatment to enable the commencement or continuation of more intensive psychotherapies in the community, aiding reduced admission duration through increasing motivation to change. |
|                               | Giombini et al. (2017)   | Cohort study                | Quantitative | To evaluate the use of Cognitive remediation therapy for young people with anorexia nervosa, it found that cognitive remediation therapy promotes measurable improvements in the domains of both cognitive and behavioural flexibility, central coherence, an emotional control.  |
|                               | Herbrich et al. (2017)   | Cohort study                | Quantitative | To assess the effects of Cognitive remediation therapy 6 months after completing 10   |

|                   |                          |              |              |  |
|-------------------|--------------------------|--------------|--------------|--|
|                   |                          |              |              | sessions of Cognitive remediation therapy in adolescents with anorexia nervosa, it was found that there were no significant group differences.   |
|                   | Dahlgren et al. (2014a)  | Cohort study | Quantitative | To test the feasibility of individually tailored and delivered Cognitive remediation therapy for young females with anorexia nervosa, it was found that the intervention was feasible with regards to, the recruitment strategy, the structure of delivery, the materials, and the acceptability for clinicians involved in the study.   |
|                   | Dahlgren et al. (2014b)  | Cohort study | Quantitative | To investigate the patient and parental self-reports of executive functioning before and after Cognitive remediation therapy among adolescents with anorexia nervosa, it was found that there is a clear inconsistency between patients and parents in terms of clinical significance before and after Cognitive remediation therapy, which calls for finding a balance between generalizable results from larger group analyses and individual assessment specifics as a potential method to evaluate the potency of Cognitive remediation therapy. |
| Nutrition therapy | Pettersson et al. (2016) | Cohort study | Quantitative | In describing a 12-week intensive nutrition therapy for hospitalized anorexia nervosa adolescents and young adults in terms of energy balance, nutrient intake, body weight, body composition and food related anxiety, a structured behavioral treatment program, with a standardized, non-selective menu was implemented, where it was found that a steady weight gain and increased body mass index due to increased total body fat mass over the treatment period, in addition to improved food attitude and less food related anxiety.          |
|                   | Rocks et al. (2014)      | Cohort study | Quantitative | To describe the reported practices of Australian dietitians in the nutritional management of anorexia nervosa in children and  |



|                     |                        |                             |              |  |
|---------------------|------------------------|-----------------------------|--------------|--|
|                     |                        |                             |              | adolescent inpatients, it was found that oral meal administration is considered the best approach to re-feed patients.   |
|                     | Garber et al. (2013)   | Cohort study                | Qualitative  | While comparing higher and lower calorie diets, it was found that higher calorie meal-based approaches are more feasible for moderately malnourished patients. For more severely malnourished chronically ill patients, enteral feedings have shown good outcomes, and may in theory attenuate the high refeeding risk in these patients by avoiding the wide glucose and insulin excursions associated with meal boluses.   |
| Refeeding treatment | O'Connor et al. (2016) | Randomized controlled trial | Quantitative | To investigate the optimal regime for refeeding low weight hospitalized adolescents with anorexia nervosa, it was found that refeeding low weight hospitalized adolescents with anorexia nervosa at an initial energy intake of 1200kcal/d compared with 500 kcal/d elicited greater weight gain without increasing the incidence or severity of refeeding hypophosphatemia. These findings suggest that refeeding at a higher energy intake may be advantageous in the physiologic recovery of most low weight adolescents with anorexia nervosa. |
|                     | Madden et al. (2015)   | Cohort study                | Quantitative | To report refeeding outcomes for adolescent patients with anorexia nervosa using a standardised refeeding regime involving supported oral meals and nasogastric feeding with sufficient calories to initiate and sustain weight gain from the outset of treatment, it was found that this refeeding protocol resulted in immediate weight gain with no indicators of refeeding syndrome.   |
|                     | Peterson et al. (2016) | Cohort study                | Quantitative | To evaluate the hunger, fullness, smell, and taste responses in adolescents with newly-diagnosed eating disorders, an improvement in fullness cues for the eating disorder-refed group   |

|                  |                         |                    |              |  |
|------------------|-------------------------|--------------------|--------------|--|
|                  |                         |                    |              | compared to the eating disorder-admission group immediately following a meal was found, which enable clinicians an opportunity to combat aversive learning and discomfort associated with fullness.  |
|                  | Kezelman et al. (2016)  | Descriptive study  | Qualitative  | To examine the psychological experience over the course of an inpatient treatment implementing rapid-refeeding protocol for adolescent patients with anorexia nervosa, it was found that a multidimensional process inclusive of reconciling with the diagnosis of anorexia nervosa, adjusting to treatment, and reflecting and integrating Findings from this study provide some insight into why gaps in psychological and physiological recovery may undermine long-term clinical outcomes. Patient experiences highlighted several psychological features that may be negatively associated with rapid weight gain. Overall, findings from this study have important implications for developing an understanding of the individual's experience during acute nutritional rehabilitation of AN in adolescents. |
| Exercise therapy | Noetal et al. (2016)    | Cohort study       | Quantitative | To explore whether exercise produced acute psychological benefits for adolescent inpatients receiving treatment for anorexia, it was found that higher compulsive exercise features were associated with significantly greater decreases in anxious affect. Clinicians should be encouraged and supported to manage exercise behaviours as opposed to eliminating them to effectively reduce the risks of covert, unmanaged forms of exercise while maximising the gains that exercise has to offer.   |
| Group therapy    | Depestele et al. (2017) | Case control study | Quantitative | To examine whether multi-family therapy or multi-parent therapy differently benefits families of patients with or without binge-purging behaviours, it was found that family outcome measures  |

|                       |                                    |                   |              |   |
|-----------------------|------------------------------------|-------------------|--------------|---|
|                       |                                    |                   |              | showed improvement in family functioning according to the patients and fathers but not to the mothers, across both interventions and both eating disorder subtypes.   |
| Positive psychology   | Harrison et al. (2016)             | Cohort study      | Quantitative | To develop and implement a five session 'Positivity Group' using positive psychology interventions in adolescent eating disorder inpatient service, it was found that 75% of patients reported meaningful improvement in subjective happiness and 87.5% in life satisfaction.   |
| Qigong therapy        | Gueguen et al. (2017)              | Descriptive study | Qualitative  | While evaluating the use of qigong therapy (a mind-body intervention) for adolescents with anorexia nervosa, it was found that Qigong therapy has helped to identify incentives, barriers, and perceived effects and risks that may be encountered in other mind-body therapies.  |
| Caregiver perspective | Matthews et al. (2018)             | Cohort study      | Quantitative | To examine the relation between caregiver illness perceptions about anorexia nervosa, it was found that caregiver burden is associated with poor mental health, lower quality of life, and experiencing negative aspects of care more intensely. This study supports the relation between negative illness beliefs about anorexia nervosa and caregiver burden, particularly related to caregiver beliefs about consequences of anorexia nervosa. |
|                       | Gisladottir & Svavarsdottir (2017) | Cohort study      | Quantitative | To evaluate the effectiveness of therapeutic conversation intervention in group and caregiver sessions on the supporting role of caregivers, it was found that caregivers perceived lower behavioural difficulties of themselves and patient symptom behaviours.  |
|                       | Lafrance & Kosmerly (2015)         | Cohort study      | Quantitative | In examining clinicians' perceptions of the negative influence of emotions on clinical decisions when working with child and adolescent eating disorders, it was  |

|  |                                 |                   |              |  |
|--|---------------------------------|-------------------|--------------|--|
|  |                                 |                   |              | found that some clinicians believe that emotions can negatively affect the treatment of eating disorders, particularly when making decisions regarding family involvement.   |
|  | Rothschild-Yakar & Stein (2013) | Cohort study      | Quantitative | While analyzing how patients' perspectives or patients' measures relate to psychodynamic therapists' perspectives, as well as symptomatic and behavioral changes, it was found that the best predictor of higher outcome ratings by the therapists for inpatients with binge/purging symptoms was related to their ability to regulate their affects. Further, therapists identified in both eating disorder subtypes enduring characteristics requiring modification, namely, constricted affective life in patients with anorexia nervosa and affective dysregulation in patients with binge-purging symptoms, alongside changes in distress symptoms, enable a greater collaboration with treatment and a more favorable outcome. |
|  | Goodier et al. (2014)           | Descriptive study | Qualitative  | To examine the experience of parents of children with eating disorders after having participated in a skills-based training intervention, it was found that this intervention was acceptable as it improved knowledge and had benefits for the caregiving experience. Specifically, it is effective at helping parents manage their children's illness, and improved communication and family dynamics. Parents reported that the intervention provided them with an opportunity to discuss their experiences and learn from other parents at different stages of the eating disorder.   |
|  | Raveneau et al. (2014)          | Descriptive study | Qualitative  | To determine the attitudes of nurses and pediatric residents towards adolescents and young adults with eating disorders, it was found that eating disorder   |

|                     |  |              |              |  |
|---------------------|--|--------------|--------------|--|
|                     |  |              |              | patients admitted to an inpatient medical unit tend to evoke strong negative feelings within providers. Programs to improve communication and coordinate care are needed to relieve frustration and reduce tension in providers who care for individuals with an eating disorder.  |
| Patient perspective | Fenning et al. (2017)                  | Cohort study | Quantitative | To examine changes in core thoughts and perceptions of adolescent anorexia nervosa during inpatient weight restoration, it was found that that body mass index percentile during hospitalization for adolescent anorexia nervosa were not associated with significant improvement in core anorexic thoughts and perceptions, such as body dissatisfaction, drive for thinness, weight concern and shape concern. Instead, an intensive, open inpatient intervention for medically stabled adolescents with anorexia nervosa appears to have a significant nutritional/medical impact but only a limited effect on core anorexic thoughts and perceptions change. |
|                     | Malmendier-Muehlschlegel et al. (2016) | Cohort study | Quantitative | To explore the relationship between quality of friendships, motivation to change and peer support among young people receiving inpatient treatment for anorexia nervosa, it was found that friendships were not related to becoming more entrenched with anorexia nervosa, which is considered surprising given peer influence has been found to impact eating pathology in hospital environments.   |
|                     | Hillen et al. (2015)                   | Cohort study | Quantitative | To evaluate (1) an association between patient characteristics, motivation to change at admission and perception of the admission process, (2) whether the motivation to change varied over the course of treatment, and (3) whether motivation to change at admission had an impact on treatment outcomes   |

|                      |                             |   |               |  |
|----------------------|-----------------------------|---|---------------|--|
|                      |                             |   |               | with respect to weekly weight gain and improvements in eating disorder specific psychopathology, it was found that first time greater motivation to change at the beginning of treatment resulted in a faster weekly weight gain in adolescent patients with anorexia nervosa during hospital treatment.   |
| Therapeutic alliance | Bourion-Bedes et al. (2013) | Cohort study  | Quantitative  | To examine patient, therapist, and parent therapeutic alliance ratings over time between these individuals, it was found that the better perception of early therapeutic alliance was significantly related to shorter time to achieve the target weight in patients with anorexia nervosa.  |
|                      | Zugai et al. (2018)         | Cohort study (Quantitative) and Descriptive study (Qualitative) | Mixed methods | To develop a greater understanding of the nature of the inpatient therapeutic alliance between nurses and consumers with anorexia nervosa, it was found that nurses must recognize and harness the therapeutic potential of their potential of intimacy and power in the inpatient setting; a maternalistic approach may be an effective nursing approach. Overall, the integration of the therapeutic alliance concept in practice is dependent on the availability of appropriate resources, training and structured supervision for nurses. |

## **Critical Appraisal of Included Studies**

Critical appraisal for all studies was completed by one reviewer (SP). The Joanna Briggs Institute is organization concerned with improving health outcomes by ensuring that the research evidence is synthesized, transferred, and implemented in a culturally inclusive and relevant manner (The Joanna Briggs Institute, 2017). The critical appraisal tools helped to determine the appropriateness of the study findings based on the overall study quality. Qualitative studies were critically appraised using the Joanna Briggs Institute's critical appraisal checklist for qualitative research (The Joanna Briggs Institute, 2017). Quantitative studies were critically appraised using the Joanna Briggs Institute's critical appraisal checklist for randomized controlled trials, cohort studies and case control studies (The Joanna Briggs Institute, 2017). Qualitative components of mixed methods studies were critically appraised using the Joanna Briggs Institute's critical appraisal checklist for qualitative research while the quantitative components of mixed methods studies were critically appraised using the Joanna Briggs Institute's critical appraisal checklist for cohort studies (The Joanna Briggs Institute, 2017). The purpose of these tools were to assist in assessing the trustworthiness, relevance, and results of studies (The Joanna Briggs Institute, 2017).

## **Synthesis Method**

As the research studies included in the review included a range of different interventions addressing a variety of treatment outcomes, it was not possible to conduct a meta-analysis, therefore a narrative synthesis of results was performed. This approach enabled an overall assessment of robustness of the evidence per intervention type.

Therefore, quantitative results from experimental and non-experimental studies, along with qualitative findings from descriptive studies are presented in narrative form.



## Chapter 4 Results

In this section, I present an overview of study quality of included studies, organized by study type. Of the 43 included studies, nine were descriptive studies, 27 were cohort studies, four were randomized controlled trials, one was a case control study, and two were mixed methods studies.

Table 1.1 shows the critical appraisal scoring of the selected four randomized controlled trial studies using the Joanna Briggs Institute critical appraisal tool for randomized controlled trials.

Table 1.1. *Assessment of methodological quality of randomized controlled trials*

| Theme                  | Citation               | Q 1 | Q 2 | Q 3 | Q 4 | Q 5 | Q 6 | Q 7 | Q 8 | Q 9 | Q 10 | Q 11 | Q 12 | Q 13 | Total (%) |
|------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|-----------|
| Inpatient treatment    | Madden et al. (2015)   | Y   | Y   | Y   | Y   | Y   | U   | Y   | Y   | Y   | Y    | Y    | Y    | Y    | 92        |
| Family-based treatment | Lock et al. (2016)     | Y   | U   | Y   | U   | Y   | U   | U   | U   | Y   | Y    | Y    | Y    | Y    | 62        |
|                        | Madden et al. (2015)   | Y   | U   | Y   | Y   | U   | U   | U   | Y   | Y   | Y    | Y    | Y    | Y    | 69        |
| Refeeding treatment    | O'Connor et al. (2016) | Y   | U   | Y   | Y   | U   | U   | U   | Y   | Y   | Y    | Y    | Y    | Y    | 69        |
| Total (%)              |                        | 100 | 25  | 100 | 75  | 50  | 0   | 25  | 75  | 100 | 100  | 100  | 100  | 100  |           |

Y, yes; N, no; U, unclear.

Q1: Was true randomization used for assignment of participants to treatment groups? Q2: Was allocation to treatment groups concealed? Q3: Were treatment groups similar at the baseline? Q4: Were participants blind to treatment assignment? Q5: Were those delivering treatment blind to treatment assignment? Q6: Were outcomes assessors blind to treatment assignment? Q7: Were treatment groups treated identically other than the intervention of interest? Q8: Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed? Q9: Were participants analyzed in the groups to which they were randomized? Q10: Were outcomes measured in the same way for treatment groups? Q11: Were outcomes measured in a reliable way? Q12: Was appropriate statistical analysis used? Q13: Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?

In all studies, randomization (Q1) was performed; however, only in two studies was it stated how randomization was conducted. Madden et al. (2015) randomized each cluster through a blind random binary list created by an external statistician, while, O'Connor et

al. (2016) conducted randomized using a SIMIM minimization computer program. Although it was clear that randomized allocation was performed in all studies (Q2), concealed randomization was explicit only in the study by Madden et al. (2015), a study in which the effectiveness of hospitalization as an overall treatment method for weight restoration was compared to medical stabilization in adolescent anorexia nervosa. For all four studies, treatment and comparison groups were similar at baseline (Q3). It was also clear that participants in three out of the four studies were blinded to the treatment assignment (Q4). Lock et al. (2016) mentioned that the clinicians delivering treatment (Q5) were blinded to the randomization and treatment assignment of participants as did Madden et al. (2015). Blinding is important as it minimizes the risk of confounding variables. Whether the outcomes assessors were blind to the treatment assignment (Q6) was unclear as none of the studies discussed this component. Question 7 addresses treatment differences between groups other than the intervention of interest, which may cause selection bias. This was difficult to determine as only the Madden et al. (2015) study discussed this. However, it was clear that all studies other than Lock et al. (2016) compared groups from the moment of allocation to the end time of trial, resulting in complete knowledge of measurement and observation results for the entire duration of the trial (Q8). In all studies, participants were analyzed in the groups to which they were randomized (Q9), with outcomes measured in a similar reliable way (Q10 and Q11) for the treatment groups with appropriate statistical analysis (Q12).

Table 1.2 shows the critical appraisal scoring of the included cohort studies using the Joanna Briggs Institute's checklist for cohort studies.

Table 1.2. *Assessment of methodological quality of cohort studies*

| Theme                         | Citation                           | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Total (%) |
|-------------------------------|------------------------------------|----|----|----|----|----|----|----|----|----|-----|-----|-----------|
| Inpatient treatment           | Avnon et al. (2017)                | Y  | Y  | Y  | N  | Y  | Y  | Y  | U  | U  | N   | Y   | 64        |
|                               | Schlegl et al. (2015)              | N  | N  | Y  | N  | N  | Y  | Y  | Y  | N  | Y   | Y   | 55        |
|                               | Naab et al. (2013)                 | N  | N  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 36        |
|                               | Bergh et al. (2013)                | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | Y   | Y   | 55        |
|                               | Bravender et al. (2017)            | Y  | Y  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | U   | 55        |
| Family-based treatment        | Dimitropoulos et al. (2018)        | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | Y   | Y   | 55        |
|                               | Halvorsen et al. (2018)            | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | Y   | Y   | 55        |
| Cognitive behavioural therapy | DalleGrave et al. (2014)           | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | Y   | 45        |
| Cognitive remediation therapy | Harrison et al. (2018)             | Y  | Y  | Y  | Y  | N  | Y  | Y  | N  | N  | N   | Y   | 64        |
|                               | Giombini et al. (2017)             | N  | N  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 36        |
|                               | Herbrich et al. (2017)             | Y  | Y  | Y  | N  | N  | Y  | Y  | Y  | Y  | Y   | Y   | 82        |
|                               | Dahlgren et al. (2014a)            | Y  | Y  | Y  | N  | N  | Y  | U  | N  | U  | N   | Y   | 45        |
|                               | Dahlgren et al. (2014b)            | N  | N  | Y  | Y  | N  | Y  | Y  | N  | U  | N   | Y   | 45        |
| Nutrition therapy             | Pettersson et al. (2016)           | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | Y   | 45        |
|                               | Rocks et al. (2014)                | N  | N  | Y  | N  | N  | Y  | U  | Y  | U  | N   | Y   | 36        |
|                               | Garber et al. (2013)               | Y  | Y  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 55        |
| Refeeding treatment           | Madden et al. (2015)               | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | Y   | 45        |
|                               | Peterson et al. (2016)             | Y  | Y  | Y  | Y  | N  | Y  | Y  | N  | U  | N   | Y   | 64        |
| Exercise therapy              | Noetal et al. (2016)               | Y  | Y  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 55        |
| Positive psychology           | Harrison et al. (2016)             | N  | N  | Y  | Y  | N  | Y  | Y  | Y  | N  | N   | U   | 45        |
| Caregiver perspective         | Matthews et al. (2018)             | N  | N  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 36        |
|                               | Gisladottir & Svavarsdottir (2017) | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | Y   | 45        |
|                               | Lafrance & Kosmerly (2015)         | N  | N  | Y  | N  | N  | Y  | U  | N  | N  | N   | Y   | 27        |
|                               | Rothschild-Yakar & Stein (2013)    | Y  | Y  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 55        |

|                      |  |    |    |    |    |   |     |    |    |   |    |    |    |
|----------------------|--|----|----|----|----|---|-----|----|----|---|----|----|----|
| Patient perspective  | Fenning et al. (2017)                  | N  | N  | Y  | N  | N | Y   | Y  | U  | N | N  | Y  | 27 |
|                      | Malmendier-Muehlschlegel et al. (2016) | N  | N  | Y  | Y  | N | Y   | Y  | N  | N | N  | Y  | 45 |
|                      | Hillen et al. (2015)                   | N  | N  | Y  | N  | N | Y   | Y  | N  | N | N  | Y  | 36 |
| Therapeutic alliance | Bourion-Bedes et al. (2013)            | Y  | Y  | Y  | N  | N | Y   | Y  | Y  | U | Y  | Y  | 73 |
|                      | Zugai et al. (2018)                    | Y  | Y  | U  | N  | N | Y   | Y  | N  | N | N  | Y  | 45 |
| Total (%)            |  | 38 | 38 | 97 | 17 | 3 | 100 | 90 | 45 | 3 | 21 | 93 |    |

Y = yes; N = no; U = unclear.

Q1: Were the two groups similar and recruited from the same population? Q2: Were the exposures measured similarly to assign people to both exposed and unexposed groups? Q3: Was the exposure measured in a valid and reliable way? Q4: Were confounding factors identified? Q5: Were strategies to deal with confounding factors stated? Q6: Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)? Q7: Were the outcomes measured in a valid and reliable way? Q8: Was the follow up time reported and sufficient to be long enough for outcomes to occur? Q9: Was follow up complete, and if not, were the reasons to loss to follow up described and explored? Q10: Were strategies to address incomplete follow up utilized? Q11: Was appropriate statistical analysis used?

Question 1 refers to the generalizability of the included cohort studies. Most did not include two cohort groups to compare similarities and differences. However, the authors did provide clear inclusion and exclusion criteria prior to recruitment of study participants. In the nine studies that did compare two cohort groups, all characteristics were similar except for exposure status. It was also clear that the measures of exposure were similar in assigning research participants to exposed and unexposed groups (Q2) and that exposures in all but one study by Zugai et al. (2018) were measured in a valid and reliable way (Q3) therefore indicating the results to be of high quality and appropriate to the research question. However, it was difficult to assess bias due to confounding factors as a majority of the studies did not identify any confounding variables or discusses strategies to address confounding factors (Q4 and Q5). In all studies, it was clear that groups and participants were, at the moment of exposure, free of the outcome (Q6). Similarly, in all but three studies, authors clearly indicated that the

outcome measures were valid and reliable (Q7) thus indicating strong outcome validity across studies. However, only 45% of the studies indicated an appropriate follow-up length of time, sufficient for outcomes to occur. (Q8). Herbrich et al. (2017) clearly indicated that although there was no follow up, the authors aimed to assess the effects of their intervention six months later (Q9 and Q10). Regardless, in all but two studies by Bravender et al. (2017) and Harrison et al. (2016), statistical analyses were appropriate to study results.

Table 1.3 shows the scoring of the included case control studies using the Joanna Briggs Institute's checklist for case control studies.

Table 1.3. *Assessment of methodological quality of case control studies*

| Theme         | Citation                | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Total (%) |
|---------------|-------------------------|----|----|----|----|----|----|----|----|----|-----|-----------|
| Group therapy | Depestele et al. (2017) | Y  | Y  | Y  | U  | Y  | N  | N  | U  | Y  | Y   | 60        |

Y, yes; N, no; U, unclear.

Q1: Were the groups comparable other than the presence of disease in cases or the absence of disease in controls? Q2: Were cases and controls matched appropriately? Q3: Were the same criteria used for identification of cases and controls? Q4: Was exposure measured in a standard, valid and reliable way? Q5: Was exposure measured in the same way for cases and controls? Q6: Were confounding factors identified? Q7: Were strategies to deal with confounding factors stated? Q8: Were outcomes assessed in a standard, valid and reliable way for cases and controls? Q9: Was the exposure period of interest long enough to be meaningful? Q10: Was appropriate statistical analysis used?

There was only one case control study of good quality with most of the critical appraisal items addressed very clearly as per the critical appraisal checklist. However, indication of confounding factors was not mentioned (Q6 and Q7). It was also unclear whether the exposure (Q4) and outcomes (Q8) were measured in a standard, valid, and reliable way.

Table 1.4 shows the scoring of the included qualitative research using Joanna Briggs Institute's checklist for qualitative research.

Table 1.4. *Assessment of methodological quality and risk of bias of qualitative research*

| Theme                  | Citation                | Q1 | Q2  | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Total (%) |
|------------------------|-------------------------|----|-----|----|----|----|----|----|----|----|-----|-----------|
| Inpatient treatment    | Zugai et al. (2013)     | N  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 80        |
|                        | Harken et al. (2017)    | N  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 80        |
|                        | Basker et al. (2013)    | N  | Y   | N  | N  | N  | N  | N  | N  | N  | Y   | 20        |
|                        | Beukers et al. (2015)   | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
|                        | Bravender et al. (2017) | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
| Family-based treatment | Couturier et al. (2013) | Y  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 90        |
| Refeeding treatment    | Kezelman et al. (2016)  | N  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 80        |
| Qigong therapy         | Guegan et al. (2017)    | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
| Caregiver perspective  | Goodier et al. (2014)   | N  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 80        |
|                        | Raveneau et al. (2014)  | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
| Therapeutic alliance   | Zugai et al. (2018)     | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
| Total (%)              |                         | 9  | 100 | 91 | 91 | 91 | 0  | 45 | 91 | 91 | 100 |           |

Y, yes; N, no; U, unclear.

Q1: Is there congruity between the stated philosophical perspective and the research methodology? Q2: Is there congruity between the research methodology and the research question or objectives? Q3: Is there congruity between the research methodology and the methods used to collect data? Q4: Is there congruity between the research methodology and the representation and analysis of data? Q5: Is there congruity between the research methodology and the interpretation of results? Q6: Is there a statement locating the researcher culturally or theoretically? Q7: Is the influence of the researcher on the research, and vice-versa, addressed? Q8: Are participants, and their voices, adequately represented? Q9: Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body? Q10: Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

Among all 11 qualitative studies, only one study by Couturier et al. (2013) indicated clear congruity between the stated philosophical perspective and the research methodology (Q1) with the authors drawing from the tenants of naturalistic inquiry to examine therapist perspectives on implementing evidence-based practices and factors influencing the adoption of family-based treatment for adolescents with anorexia nervosa. No other

study made such a clear distinction between philosophical perspective and the research design. However, all qualitative studies did clearly indicate congruity between the research methodology and the research question or objectives (Q2). Similarly, all but one study by Basker et al. (2013) discussed congruity between the research methodology and the methods used to collect data (Q3), the representation and analysis of data (Q4), and the interpretation of results (Q5). No studies located the researcher culturally or theoretically by discussing individual beliefs and values and the potential influence on the study (Q6). In only 45% of the studies were the potential influences of the researcher on the research and vice-versa (Q7) briefly mentioned, with no specific details. However, representation of participants and their voices (Q8) was clearly articulated in all studies except for Basker et al. (2013) where there were no clear conclusions to assure adequate representation. Similarly, ethical approval was obtained in all studies (Q9) except for the Basker et al. (2013) study where this information was not included. The relationship of study conclusions to data interpretation was clear in all studies (Q10) with findings based on data congruent with the study design.

## **Chapter 5 Discussion**

Despite recent advancements in the understanding of eating disorder interventions and practices for adolescents, there continues to be gaps in knowledge relating to disease burden along with short- and long-term patient outcomes (Katzman, Madden, Nicholls, Mawjee, & Norris, 2017). My research aimed to address these knowledge gaps by systematically evaluating the research evidence on effectiveness of adolescent inpatient eating disorders programs and treatment interventions through a mixed studies systematic review. The mixed studies systematic review focused on specific inpatient eating disorder interventions and practices and implications for recovery. Specialized inpatient eating disorder programs for adolescents are important as effective treatment could prevent future chronic occurrences of the disorder (Naab et al., 2013). As such, the accessibility of a structured eating disorder program along with the availability of an experienced multidisciplinary team are associated with effective treatment outcomes (Naab et al., 2013). In this discussion chapter research findings are presented towards understanding program and treatment intervention components of adolescent inpatient eating disorder programs that have shown to result in positive patient outcomes. Relevant findings from the critically appraised included studies in Chapter 4, that result in improved patient outcomes are discussed per intervention and/or practice.

### **Family Based Treatment**

Family Based Treatment (FBT) is a psychosocial treatment found to have strong evidence supporting its effectiveness in treatment of anorexia nervosa for adolescents (Couturier, Kimber, Jack, et al., 2013; Dimitropoulos et al., 2018; Halvorsen, Reas,



Nilsen, & Rø, 2018; Madden, Miskovic-Wheatley, Wallis, Kohn, Hay, et al., 2015). The primary goal of FBT for anorexia nervosa is the achievement of weight restoration to alleviate medical instability and minimize long-term health consequences that occur because of starvation and malnutrition associated with anorexia nervosa (Dimitropoulos et al., 2018). The use of FBT has also been found to reduce hospitalization in adolescent anorexia nervosa, (Lock et al., 2016). This leads to fewer rehospitalizations following FBT due to greater weight gain, which decreases the likelihood of medical instability (the main characteristic for hospitalization) (Lock et al., 2016). Early weight gain is an important outcome as it is a predictor of remission at a 12-month follow-up (Madden, Miskovic-Wheatley, Wallis, Kohn, Hay, et al., 2015). This indication suggests that early weight gain in FBT can be understood to be a marker of treatment effectiveness in FBT with the potential to distinguish those likely to respond to FBT from those who may need additional and/or intensive treatment to achieve remission (Madden, Miskovic-Wheatley, Wallis, Kohn, Hay, et al., 2015).

A key component of FBT is the involvement of parents and caregivers in the treatment process. If parents are not closely involved in daily care and treatment during hospital stay, treatment may fail to strengthen their confidence in their own ability to help their child and to manage meals at home, which are important elements in FBT (Halvorsen et al., 2018). FBT is associated with increased feelings of parental efficacy and acquisition of skills resulting in successful coping and management of the adolescents' eating disorders as well as reduce parental distress and improve caregiver mental health (Halvorsen et al., 2018). The FBT protocol based on the Maudsley

approach is an important intervention in eating disorders treatment that is considered complete if the family attended 20 sessions or if the goals of the treatment were met prior to this, with treatment ending by mutual consent of the therapist, parents, medical team, and investigators of the study (Madden, Miskovic-Wheatley, Wallis, Kohn, Hay, et al., 2015). As such, FBT for adolescents with anorexia nervosa, where parents play an active role in the task of refeeding their child is also recommended. This approach is individualized for each family and they are encouraged to set up a set of incentives to encourage weight gain (Couturier, Kimber, Jack, et al., 2013). This treatment typically runs for a duration of approximately one year with an initial focus on weight restoration as the first phase motivates parents to take charge of the refeeding process, while the second phase focuses on the transfer of control over food intake and exercise back to the adolescent, and the third phase addresses general adolescent issues (Couturier, Kimber, Jack, et al., 2013).

However, specific considerations need to be ensured for FBT to be effective. Components include the demanding nature of FBT in terms of time commitment for therapists and families, adequate attention to comorbid symptoms, need for parental consistency, consistent family meals in the real-world context, and the need for sibling involvement. Some organizational factors that are important to consider are director support, team buy-in, funding and resources (e.g., space, wages, and training). While, individual therapist components involve experience in the field of eating disorder treatment, individual capacity and comfort level in working with adolescents and families, personal motivation to adopt to FBT, and a belief in the value and efficacy of

FBT approaches (Couturier, Kimber, Jack, et al., 2013) is also important to consider when ensuring effectiveness in FBT for adolescents with eating disorders.

Therapists reported FBT to have a clear structure to learn and implement within an eating disorder patient population (Couturier, Kimber, Jack, et al., 2013). They noted that the focus on parents having control over the refeeding of their child and assisting them back to health was a clear advantage to this treatment model. They also emphasized that separating the eating disorder from the patient (a tenant of FBT) as well as engaging in the refeeding process before addressing underlying issues of the disordered eating makes logical and therapeutic sense because without first addressing the impact of starvation caused by the eating disorder on the cognitive brain function, engaging in therapeutic processes is often futile. Thus, separating the adolescent from the eating disorder by using the externalizing techniques from FBT principles as well as reiterating to the adolescent that they are not to blame for the eating disorder is important to effectively engage them and their family in the therapeutic process (Couturier, Kimber, Jack, et al., 2013).

Although evidence supports the use of FBT for eating disorders treatment, it should be noted that FBT may be less effective for older adolescents than for younger adolescents with anorexia nervosa. Adaptations made to accommodate for this difference is not currently not manualized (Dimitropoulos et al., 2018). As such, the study by Dimitropoulos et al. (2018) took findings from previous qualitative studies to develop a manualized treatment of FBT for transition age youth (16 to 25 years) as this was the target population of their study. They did this by building on the foundational model of

FBT for adolescents with anorexia nervosa and bulimia nervosa and incorporated developmental considerations unique to older adolescents and young adults (Dimitropoulos et al., 2018). It was found that FBT adapted for transition aged youth (16 to 25 years) was both feasible and acceptable to transition age youth and their families. This study also showed statistically significant increases in weight from baseline to end-of-treatment and at three-month follow up (Dimitropoulos et al., 2018). This is an important component of FBT as weight gain in adolescents with anorexia nervosa has been found to significantly improve psychological recovery (e.g., eating disorder psychopathology, depression, and self-esteem) at the end of treatment as well as up to one-year follow up. Continual familial support of transition age youth (16 to 25 years) during follow-up is also essential for sustaining recovery overtime (Dimitropoulos et al., 2018). Therefore, healthcare professionals need to consider familial support as a crucial component in eating disorders treatment, specifically across the invisible divide between the pediatric and adult treatment systems where transition age youth (16 to 25 years) often seek treatment.

### **Cognitive Behaviour Therapy**

Several other standardized interventions also lead to positive outcomes for patients with eating disorders as well, such as, Cognitive Behaviour Therapy-Enhanced (CBT-E). This is a form of intensive psychotherapy that is suitable for both an inpatient setting and adolescents. This treatment approach focuses on the patient's entire functioning (i.e., physical, psychological, and social) not only eating and weight. It is designed to improve a person's control over their eating and life and as such this

treatment is well accepted by patients (Dalle Grave, Calugi, El Ghoch, Conti, & Fairburn, 2014). In a study looking at the implementation of CBT-E, 85% of eligible patients accepted the treatment and 96% completed the program with an increased BMI accompanied by a marked decrease in eating disorder symptoms and general psychopathology (Dalle Grave et al., 2014). Patients also maintained improvements in weight, eating disorder psychopathology, and general psychiatric features with CBT-E treatment following discharge (Dalle Grave et al., 2014). Inpatient CBT-E as an intervention was also found to lower the rate of relapse (which is typical of traditional inpatient treatment). CBT-E focuses on addressing key mechanisms of eating disorder psychopathology by:

- developing of personalized relapse prevention skills
- involving of parents in the treatment to create an optimal family environment that supports the patient's efforts to change, and;
- exposing patients to potential environmental triggers of relapse

This has been found to lead to positive treatment outcomes (i.e., increased weight and improved psychopathology) that is well accepted by adolescents diagnosed with eating disorders. As such, CBT-E is a promising treatment for adolescents with severe anorexia nervosa (Dalle Grave et al., 2014).

### **Cognitive Remediation Therapy**

Cognitive Remediation Therapy (CRT) on the other hand is reported to be a relatively new form of treatment for eating disorders with techniques originating from brain lesion interventions that targets the process of thinking (Dahlgren, Lask, Landro, &

Ro, 2014). By doing so, cognitive rigidity and core cognitive features of the illness are reduced (Dahlgren, Lask, Landro, et al., 2014). Patients receiving group CRT rated it as highly acceptable, with feedback from clinicians delivering the treatment reinforcing its feasibility in eating disorder treatment programme (Dahlgren, Lask, Landrø, & Rø, 2014; Harrison et al., 2018). CRT has also been reported to be a useful adjunct treatment for adolescents with anorexia nervosa (Harrison et al., 2018). It is a brief low intensity cognitive intervention acceptable to adolescents diagnosed with anorexia nervosa, as it provides cognitive skills and a positive experience of engagement with treatment to enable the continuation of a more intensive psychotherapy in a community setting (Harrison et al., 2018). CRT is associated with promoting measurable improvements in cognitive and behavioural flexibility, central coherence, and emotional control, however the strength of these results is poor as there was no control group in studies investigating the effectiveness of CRT for children and adolescents with anorexia nervosa (Dahlgren, Lask, Landrø, et al., 2014; Giombini, Moynihan, Turco, & Nesbitt, 2017). Further research is needed to address whether adolescents with anorexia nervosa in general show neuropsychological inefficiencies instead of the subgroup of patients outlined in CRT studies (Herbrich et al., 2017). An analysis of patient and parental experiences of CRT is also recommended to establish user feasibility (Herbrich et al., 2017) (Dahlgren et al., 2014b). In addition, large randomized controlled trials measuring quality of life, motivation to change, and metacognitive effects are needed to evaluate the beneficial effects of CRT (Herbrich et al., 2017). Although there was no significant difference between CRT only and treatment as usual following CRT, CRT *in addition* to treatment

as usual has been found to have a positive effect on therapeutic alliance and might keep patients engaged in therapy (Herbrich et al., 2017).

### **Other Eating Disorder Interventions**

However, several other interventions and practices are also involved on inpatient eating disorder treatment that have resulted in good patient outcomes, such as multi family therapy and multi-parent therapy on an inpatient eating disorder unit. These therapies have been found to improve eating disorder symptomatology (i.e., drive for thinness and body dissatisfaction) (Depestele et al., 2017). Positive psychology interventions on the other hand was also found to be feasible and result in beneficial changes where 75% of patients reported meaningful change for subjective happiness and 87.5% for life satisfaction (Harrison, Al-Khairulla, & Kikoler, 2016). In addition, compulsive exercise has also been found to play an important role in the etiology, development, and maintenance of eating disorders (Noetel et al., 2016). As such, structured exercise interventions that do not compromise medical stability and weight gain were found to be associated with low levels of anxiety and depression leading to increased positive outcomes in terms of recovery following exercise (Noetel et al., 2016). Qigong therapy (a mind-body intervention that involves slow movements, breathing, and meditation exercises) is another intervention that can potentiate psychotherapy and contribute to the recovery process in patients with anorexia nervosa (Gueguen et al., 2017). These interventions are typically used adjunctively to eating disorders treatment to strengthen eating disorder programs towards positive outcomes.

## **Therapeutic Alliance**

Therapeutic alliance is an important aspect in the treatment of eating disorders. However, it can be challenging to achieve between a nurse and a patient as most patients with anorexia nervosa do not acknowledge their problems and express little emotion to change (Bourion-Bedes et al., 2013). This ego-syntonic nature of anorexia nervosa strains the therapeutic alliance between a nurse and patient (Zugai, Stein-Parbury, & Roche, 2018). An assessment of patients' and therapists' estimates of collaboration and outcome is therefore relevant in the treatment of eating disorders. This is because of the challenges associated to treating eating disorders, specifically because of the complex pathogenesis in patients with the eating disorders and the difficulty in treatment due patients resisting a change in their symptoms (Rothschild-Yakar, Lacoua, & Stein, 2013). It has been found that therapists ought to be more aware of and relate to the patients' perspective as to what constitutes a genuine change during treatment as such an approach may enhance the therapeutic alliance, facilitate the process of treatment, and improve its outcome (Rothschild-Yakar et al., 2013). When an early awareness of a therapeutic alliance is achieved, reaching a target weight (an outcome of eating disorder treatment) is quicker (Bourion-Bedes et al., 2013). Even when the patient and the therapist do not share similar views of early therapeutic alliance, if they are able to work together on mutual goals, which outweigh the differences achieving a target weight becomes easier (Bourion-Bedes et al., 2013).

The collaboration established by a therapeutic alliance is considered an effective channel of care valued by patients who have received treatment for anorexia nervosa in



an inpatient setting and by nurses who specialize in their care (Zugai et al., 2018). By maintaining a solid foundation of positive interpersonal dynamics, patients felt confident about the therapeutic intent of the nurse and experienced treatment as an act of caring (Zugai et al., 2018). Such meaningful relationships enabled nurses to acknowledge patients as unique individuals as opposed to their eating disorder diagnosis, which in turn enhanced the experience of care and recovery when they respected patients as individuals which in turn enabled patients to engage in their care (Zugai et al., 2018). Such relationships have to involve nurses maintaining a consistent set of expectations, while also having a flexibility for individualistic care, which consists of making decisions in consideration of the patients' stage in recovery and other personal and individual factors (Zugai et al., 2018). As such, establishing an early therapeutic alliance is an important consideration in the treatment of eating disorders. However, it must be recognized that the integration of the therapeutic alliance concept in practice is dependent on the availability of appropriate resources, training, structured supervision for nurses. The organization and culture of the inpatient unit must be conducive to the alliance, with nurses able to give sufficient time and opportunities to engage with consumers (Zugai et al., 2018).

### **Caregiver Perspective**

As caregivers are heavily involved in the treatment of individuals with eating disorders, their perspective is crucial to consider. Many caregivers (90 – 96%) value the support of psycho-education, tasks, discussions, and interviews as this results in changed illness beliefs about symptom effects, reduced hostility towards the patient suggesting

positive outcomes for the patient, and higher levels of parental self-efficacy in coping with the illness (Gisladdottir, Treasure, & Svavarsdottir, 2017). Clinicians reported the least discomfort with decisions related to food and weight followed by decisions regarding autonomy, control, and the involvement of the family in treatment. As decisions about food and weight tend to be objective as they are based on numerical or physiological criteria, they are less susceptible to the influence of emotion (Lafrance Robinson & Kosmerly, 2015). Clinicians were sometimes cautious when determining the intensity or type of involvement of a critical or dismissive parent as they feared their parenting style may exacerbate symptoms and affect treatment (Lafrance Robinson & Kosmerly, 2015). However, parental involvement in the treatment of adolescents is crucial; therefore, it may be useful to develop treatment guidelines when engaging with critical dismissive, and non-custodial parents so that clinicians' emotional reactions do not interfere with delivery of treatment (Lafrance Robinson & Kosmerly, 2015). An examination of specific factors that influence individual clinician responses (e.g., level of experience, emotional drain) and team variables (e.g., specialized program, culture of acceptance around emotions) should also be considered (Lafrance Robinson & Kosmerly, 2015).

The effectiveness of a therapeutic conversation intervention is promising for caregivers of people with eating disorders when caregivers are given psycho-educational training towards increased insight into the eating disorder symptoms of their child. This, in turn, reinforces their awareness and ability to support their child's needs, while addressing aspects of their own temperaments and caring methods towards good clinical

outcomes for the child displayed by significant changes in provided support, illness beliefs, self-efficacy, and quality of life (Gísladóttir et al., 2017). As such clinicians need to ensure a caregiver's understanding of the illness and associated consequences, while concurrently instilling hope for recovery and parental self-efficacy (Matthews, Lenz, Peugh, Copps, & Peterson, 2018).

A skills-based training intervention is an example of an acceptable intervention as it improves parental knowledge, has benefits for the caregiving experience, is effective in helping parents manage their child's illness, and results in improved communication and family dynamics (Goodier et al., 2014). Parents experienced in using this intervention reported that it provided them with an opportunity to discuss their experiences and learn from other parents at different stages of their child's eating disorder, while providing a normalizing atmosphere that was supportive (Goodier et al., 2014). Such supports are therefore useful to build caregiver capacity to eating disorders, which strengthens their ability to support the individual diagnosed with an eating disorder.

### **Nutritional Therapy and Refeeding**

In addition, nurses and residents both identified nutrition in addition to psychotherapy as effective treatments for eating disorders (Raveneau, Feinstein, Rosen, & Fisher, 2014). Numerous medical complications associated with anorexia nervosa are reversible and resolvable through nutritional therapy (Pettersson et al., 2016; Rocks, Pelly, & Wilkinson, 2014). Physiological consequences of anorexia nervosa are serious and require hospitalisation for urgent medical stabilization and weight recovery (Rocks et al., 2014). Guidelines for the treatment of anorexia nervosa emphasize the importance of

nutritional therapy to restore weight and help patients normalize their eating habits (Pettersson et al., 2016). In a multidisciplinary approach in the management of anorexia nervosa, dieticians play a key role in developing effective treatment strategies for successful nutritional rehabilitation as they have the knowledge, skills, and expertise extending beyond nutritional management to support young patients in physiological and psychological recovery (Rocks et al., 2014).

Patients diagnosed with anorexia nervosa report fear of eating various food items due to the amount of anxiety caused. As such, one recommendation considered fundamental to regaining and maintaining health during treatment is that patients be served a variety of foods to allow opportunity to try meals and snacks never previously experienced. With this approach patients become more confident and learn more about the amounts of foods consumed during treatment (Pettersson et al., 2016). Another factor of vital importance for successful recovery from anorexia nervosa is weight restoration. Patients' motivations to change eating habits along with a shorter disease duration were contributing factors to weight gain (Pettersson et al., 2016). During initiation of treatment, the suggested energy requirements for re-feeding are 800 to 1000 kcal to 1250 to 1750 kcal per day depending on the physiological state and recent intake of the patient (Rocks et al., 2014). Higher calorie diets during refeeding resulted in shorter lengths of stay in hospital as patients were noted to be discharged nearly six days earlier (Garber et al., 2013). A higher caloric prescription on discharge, in addition to the higher caloric diet during inpatient stay, resulted in faster weight gain leading to earlier weight recovery (Garber et al., 2013).

However, existing recommendations on the treatment for weight restoration in young inpatients were based on observational studies or derived from consensus of clinical experience and expertise (Rocks et al., 2014). Evidence for routine supplementation with vitamins and minerals in young inpatients with anorexia nervosa is also limited. Nevertheless, it is important to note that nutritional deficiency in patients is highly individualized due to variations in the restrictive diets prior to admission. Regardless, close monitoring of electrolytes and tailored nutritional assessment based on the patient's developmental stage, physical signs and diet history have been proposed as an optimal strategy to determine potential nutritional deficiencies (Rocks et al., 2014).

The impact of malnutrition from anorexia nervosa are both short and long term on an individuals' health, more specifically in adolescents with medical instability (i.e., bradycardia, hypotension, hyperthermia, orthostatic instability and cardiac arrhythmia). To ensure safe and effective nutritional weight recovery with medical stabilization, refeeding is crucial (Kezelman et al., 2016). When initiating refeeding to a malnourished patient with anorexia nervosa, oral meal administration is considered the best approach; however, this is often rejected by the patients due to their internal struggle to consume the recommended volumes of food needed for weight restoration. As a result, high energy supplements and nasogastric feeding have been suggested as alternative methods when extra efforts are needed to meet the recommendations (Rocks et al., 2014).

Refeeding low weight hospitalized adolescents with anorexia nervosa at an initial energy intake of 1200kcal/day compared to 500kcal/day resulted in a greater weight gain without incurring the side effects of refeeding such as hypophosphatemia (O'Connor,

Nicholls, Hudson, & Singhal, 2016). The implementation of a refeeding protocol that started with continuous nasogastric feeds for the first three days of inpatient treatment followed by nocturnal nasogastric feedings at 1000kcal/day supported with a meal plan taken orally at 1500 to 1800 kcal/day on days one to seven of inpatient treatment was found to be effective in achieving weight gain (Madden, Miskovic-Wheatley, Clarke, et al., 2015). This practice is followed by a decrease in nocturnal feedings to 500kcal/day with an increase in the meal plan taken orally at 2100 to 2400kcal/day on days eight to 14 of inpatient treatment followed by a meal plan taken orally with no nasogastric feedings at 2400 to 3000kcal/day on days 15 to 18 of inpatient treatment (Madden, Miskovic-Wheatley, Clarke, et al., 2015). As such, refeeding at a higher energy intake is found to be advantageous in the physiologic recovery of the many low weight adolescents with anorexia nervosa (O'Connor et al., 2016). Patients treated with this feeding protocol gained weight safely and significantly over the course of the treatment including the first week of admission without an incidence of side effects from refeeding such as cardiac failure (Madden, Miskovic-Wheatley, Clarke, et al., 2015).

With weight restoration being the primary outcome of inpatient care, the use of weight restoration curves measured by negative cubic variance have been found to be effective in alerting clinicians regarding the risk for relapse and re-hospitalization. Measurable weight related variables in the context of relapse prevention have been body mass index at admission and discharge, achievement of target weight, and weight maintenance before discharge (Avnon et al., 2018). Performing such assessments while on an inpatient unit mitigates the risk of future relapse and enables effective treatment

during the current inpatient stay by ensuring adequate weight restoration prior to discharge. However, prolonged inpatient stay for weight restoration is also not beneficial in terms of clinical outcomes or cost-effectiveness for medically unstable adolescents with newly diagnosed individuals with anorexia nervosa of less than three years (Madden, Miskovic-Wheatley, Wallis, Kohn, Lock, et al., 2015). As such, a shorter hospitalization for medical stabilization followed by outpatient FBT has positive patient outcomes in terms of recovery (Madden, Miskovic-Wheatley, Wallis, Kohn, Lock, et al., 2015).

When identifying effective refeeding protocols, ensuring positive effects on meal-related perceptions is also crucial to recovery. Key changes in meal-related experiences from pre- to post-refeeding that provide critical information regarding eating disorder responses to food consumption are an improvement in fullness cues for the refeed adolescents immediately following a meal (Peterson et al., 2016). By understanding in a more nuanced way these perceptions, clinicians can be more responsive to the discomforts associated with the feelings of fullness for patients with eating disorder (Peterson et al., 2016) and thereby work towards establishing treatment practices that prevent these discomforts or overcome them when they are presented.

### **Patient Perspective**

Patient experiences highlighted several psychological features that were negatively associated with rapid weight gain (i.e., body image concerns), which in turn impacts patient self-esteem and expectations of success managing eating requirements and other treatment targets post-discharge (Kezelman et al., 2016). As refeeding initiates

rapid weight gain, without concurrent changes in psychological mechanisms to support further weight gain and medical stabilization, the positive outcomes of a rapid-refeeding protocol may not be effective (Kezelman et al., 2016). As such, it is suggested that while refeeding is crucial to recovery, psychological needs must also be met as individuals often expressed frustration with the predominantly physiological and medical management of their illness, particularly when they viewed the predominant cause as psychological (Kezelman et al., 2016). Therefore, treatment practices need to consider the meal-related experiences of adolescents with eating disorders. Such experiences are relevant for the purposes of developing intervention paradigms that maximize effective changes in meal-related experiences of hunger, fullness, olfaction, and gustatory functioning (Peterson et al., 2016) as well as impact weight normalization on body image, self-esteem, and self-concept (Kezelman et al., 2016). Understanding such perceptions enable significant implications for the development of effective treatment interventions and sustained clinical outcomes in the long term.

Individual factors such as motivation to change have also been found to be associated with reduced rates of relapse post inpatient eating disorder treatment (Hillen, Dimpfle, Seitz, Herpertz-Dahlmann, & Bühren, 2015). As such, considering individual factors during inpatient treatment may indicate another means for improved treatment outcomes. An intensive, inpatient program for medically stable adolescents with anorexia nervosa appeared to have significant nutritional and medical impacts but only a limited effect on core anorexic thoughts and perceptions of change for long-term recovery (Fennig, Brunstein Klomek, Shahar, Sarel-Michnik, & Hadas, 2017). However, evidence



indicates that in patients with anorexia nervosa, a readiness to change is an important predictor of outcome with respect to weight gain and improvement in eating disorder psychopathology (Hillen et al., 2015). A longer duration of illness, greater weight loss, and lower weight at admission were associated with a readiness to change (Hillen et al., 2015). This may be because patients with a longer illness duration and lower weight at admission may have experienced more starvation-associated symptoms that led to greater psychological strain and therefore had better insight into their illness and greater motivation to change compared to patients with a better health status (Hillen et al., 2015). A significant increase in motivation is associated with factors, such as positive outcomes in psychological treatment, positive relationships with fellow patients, and positive experiences in the patient's social environment (Hillen et al., 2015). Higher quality friendships were related to higher motivational changes as friendships were considered to increase the motivation to change by way of social support and greater readiness to change facilitating a fulfillment of friendships. Good quality friendships on an inpatient unit were also found to promote physical, psychological, and social rehabilitation among adolescent inpatients with anorexia nervosa (Malmendier-Muehlschlegel, Rosewall, Smith, Hugo, & Lask, 2016). As a result, attention to individual patient symptoms and peer support affect a patient's readiness to change that impact the effectiveness of interventions resulting in positive outcomes.

## **Chapter 6 Conclusion**

Effectiveness of inpatient treatment programs for adolescents with anorexia nervosa is generally associated with improvements in primary eating disorder symptoms such as weight gain and general eating disorder psychopathology (Schlegl et al., 2016). Following discharge from inpatient treatment programs, patients that showed weight increase but no change in eating disorder psychopathology were found to have a higher risk of relapse and therefore were recommended to be supported with relapse prevention strategies and intensive outpatient following inpatient treatment (Schlegl et al., 2016).

Effective nursing care is a key component in inpatient treatment. Patients on an inpatient unit reported that strong relationships with their nurses served a therapeutic purpose (Zugai, Stein-Parbury, & Roche, 2013). Establishing a therapeutic alliance may enhance weight gain and may contribute to a positively experienced admission. Through careful interaction, nurses alleviated feelings of boredom and isolation, facilitated good peer relationships in the inpatient group and relieved the stress associated with eating and gaining weight (Zugai et al., 2013). By enhancing the day-to-day ward environment by creating an enjoyable, comfortable and normalised environment, patients felt comfortable and ‘normal’ during their admission, which enabled a positive inpatient experience and improved the quality of peer relationships (Zugai et al., 2013). Through skilled interactions, nurses were able to motivate and compel patients to aspire for recovery (Zugai et al., 2013). As such, it is important to have well-educated nurses with experiential knowledge in the treatment of this patient population.

To achieve such therapeutic alliance, health care professionals need to feel supported and competent to manage the complexities of eating disorder in adolescents. Inpatient health care providers at a tertiary pediatric hospital who were caring for hospitalized children with eating disorders indicated that consistent care of this patient population was needed (Harken, Maxwell, Hainline, Pollack, & Roberts, 2017). Helping adolescent patients with severe anorexia nervosa to restore their normal eating pattern, ultimately leading to restored weight, requires specialized treatment and specialist nursing skills (Beukers, Berends, de Man-van Ginkel, van Elburg, & van Meijel, 2015). Specifically, a need for a standardized order set, expert consultation teams, and ongoing staff training was recommended to strengthen the therapeutic hospital environment for adolescents with eating disorders (Harken et al., 2017). Guidelines or a training program for healthcare professionals that enhance their knowledge of nursing interventions and attitudes when attempting to restore normal eating behaviour during the treatment of adolescent patients with anorexia nervosa is recommended to ensure that healthcare professionals are better prepared to care for this patient population (Beukers et al., 2015). Therefore, eating disorder treatment practices need to be established using good quality research. By doing so, effective interventions and practices can be implemented leading to positive patient outcomes.

However, additional program components that make it extremely difficult to care for patients with eating disorders involved issues related to communication and individualized treatment plans (Raveneau et al., 2014). As a result, programs need to have processes to improve communication and coordinated care to relieve frustration and

reduce tension in providers who care for individuals with eating disorders (Raveneau et al., 2014). Urging eating disorders patients to take more control is an effective treatment approach in addition to an inclusion of team support and meetings, knowledge of eating disorders, and familiarization with eating disorders as important factors in caring for this patient population (Raveneau et al., 2014).

Currently, the established standard of care for patients with eating disorders encompasses a multidisciplinary approach inclusive of medical, nutritional, and psychological rehabilitation (Norris et al., 2013). However, the complexities of eating disorders make it a challenging disorder to treat as medical, nutritional, and psychological interventions are implemented simultaneously. Challenges arise when no standardized processes or guidelines are available for treatment interventions and practices. Regardless, an increase in the prevalence of eating disorders as the third most common chronic illness among adolescent females (Norris et al., 2013) creates a need for effective treatment practices.

In conclusion, the results of the systematic mixed studies review suggest that current evidence regarding effective treatment interventions for adolescent inpatient eating disorders programs is available but not consistent across studies and the evidence provided is of variable quality. This creates several challenges in identifying effective components of current adolescent inpatient eating disorder programs. From this mixed-studies systematic review, findings indicate that:

- Family based therapy results in positive treatment outcomes, specifically relating to weight gain while providing a clear structure for clinicians, patients, and their families to follow during treatment.
- Cognitive behaviour therapy results in weight gain and improved eating disorder psychopathology.
- Cognitive remediation therapy results in improved cognition causing improvements in maladaptive thinking styles associated with eating disorders. Weight gain and reductions in eating disorder symptoms were also associated.
- Nutritional therapy protocols based on individual characteristics (e.g. age, gender, presenting weight, physiological state at admission, and recent intake of patients) results in positive treatment outcomes.
- Refeeding practices that focus on the rate at which nutrition is introduced is an important factor in achieving medical stability and adequate weight gain during treatment.
- Other adjunct interventions, such as multi-family group interventions, exercise therapy, positive psychology, and qigong therapy also result in positive patient outcomes relating to subjective well-being which contributes towards recovery.
- Incorporating caregiver perspectives and patient perspectives contribute towards patient success in achieving remission.
- Establishing a strong therapeutic alliance between patients and clinicians also result in strong patient outcomes.

A main goal of this study was to identify the effectiveness of current treatment interventions on inpatient eating disorder programs towards the development of standardized treatment plans that can be used across inpatient eating disorder programs to improve nursing practice and treatment outcomes for adolescents diagnosed with eating disorders. Although there is no clear indication of one intervention or practice that results in effective eating disorder treatment, it is evident that much evidence exists on multiple interventions and practice approaches that contributes to recovery from an eating disorder. The combination of several interventions and practices comprised of effective inpatient eating disorders treatment for adolescents. However, specific key components within individual interventions and standardized practices remain unclear. Although this systematic review highlights some recommendations resulting in positive patient outcomes, more evidence-based research is warranted to establish best practice guidelines towards effective inpatient care leading to recovery and ultimately remission from eating disorder.

By systematically evaluating studies examining the efficacy of eating disorders program components and treatment interventions specific to adolescent inpatient units, I identified the most effective interventions along with relevant trends and practices in eating disorder programs. I determined the most effective program components and disseminated the results to recommend evidence-based practice standards. As a Master of Nursing graduate student, I linked findings to the nursing profession specifically towards the evolution of knowledge for advanced nursing practice – for best nursing practices, for policy, for nursing education, and for significant contribution to multidisciplinary teams,

while achieving better care for individuals, better health for populations, and lower health-care costs. This potentially benefits advanced practice nursing through the utilization of research as an effective strategy with the potential for improving health services (Canadian Nurses Association, 2019).

With this research, I hoped to contribute towards improved inpatient eating disorder treatment options for adolescents and their families. The results from this study provided research evidence on treatment interventions that resulted in positive patient outcomes. It also considered the caregiver perspective and patient perspective along with therapeutic alliance. The critical analysis and synthesis of current evidence has enabled me as a healthcare professional to advocate for and critique current treatment practices, while contributing to the advancement of nursing knowledge in this area. With this knowledge I am able to impact treatment decisions that are then informed by best available research evidence in conjunction with collaborative negotiation of treatment plans through processes of reaching concordance with partners (Tusaie & Fitzpatrick, 2013) in my personal nursing practice. From this perspective, I can see the diagnosed individual and their family as experts in terms of their lived experiences and personal values, while positioning myself as the advanced practice nurse to use my knowledge from the available evidence towards positive treatment options. As such, I have been able to facilitate advanced nursing practice with a high degree of autonomy towards determining effective treatment interventions and practices where positive outcomes are supported with evidenced based knowledge.

## References

- Attia, E., Marcus, M. D., Walsh, T. B., & Guarda, A. S. (2017). The need for consistent outcome measures in eating disorder treatment programs: A proposal for the field. *International Journal of Eating Disorders*, 50, 231-234. doi:10.1002/eat.22665
- Avnon, A., Orkaby, N., Hadas, A., Berger, U., Brunstein Klomek, A., & Fennig, S. (2018). Inpatient weight curve trajectory as a prognostic factor among adolescents with anorexia nervosa: a preliminary report. *Eat Weight Disord*, 23(5), 645-651. doi:10.1007/s40519-017-0415-8
- Bailey, A. P., Parker, A. G., Colautti, L. A., Hart, L. M., Liu, P., & Hetrick, S. E. (2014). Mapping the evidence for the prevention and treatment of eating disorders in young people. *Journal of Eating Disorders*, 2(5), 1-12. doi:10.1186/2050-2974-2-5
- Barton, R., & Nicholls, D. (2008). Management of eating disorders in children and adolescents. *Psychiatry*, 7(4), 167-170. doi:10.1016/j.mppsy.2008.02.007
- Bergh, C., Brodin, U., Lindberg, G., & Sodersten, P. (2002). Randomized controlled trial of a treatment for anorexia and bulimia nervosa. *Proceedings of the National Academy of Sciences of the United States of America*, 99(14), 9486-9491. doi:10.1073/pnas.142284799
- Beukers, L., Berends, T., de Man-van Ginkel, J. M., van Elburg, A. A., & van Meijel, B. (2015). Restoring normal eating behaviour in adolescents with anorexia nervosa: A video analysis of nursing interventions. *International Journal of Mental Health Nursing*, 24(6), 519-526. doi:10.1111/inm.12150



- Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic Approaches to a Successful Literature Review*. London: SAGE Publications.
- Bourion-Bedes, S., Baumann, C., Kermarrec, S., Ligier, F., Feillet, F., Bonnemains, C., . . . Kabuth, B. (2013). Prognostic value of early therapeutic alliance in weight recovery: a prospective cohort of 108 adolescents with anorexia nervosa. *Journal of Adolescent Health, 52*(3), 344-350. doi:10.1016/j.jadohealth.2012.06.017
- Breiner, S. (2003). An evidence-based eating disorder program. *Journal of Pediatric Nursing, 18*(1), 75-80. doi:10.1053/jpdn.2003.14
- Cahill, C. (1994). Implementing an inpatient eating disorders program. *Perspectives in Psychiatric Care, 30*(3), 26-30. doi:10.1111/j.1744-6163.1994.tb00437.x
- Canadian Nurses Association. (2019). Advanced Practice Nursing: A Pan-Canadian Framework. Retrieved from <https://cna-aiic.ca/-/media/cna/page-content/pdf-en/apn-a-pan-canadian-framework.pdf?la=en&hash=E1387634D492FD2B003964E3CD4188971305469>
- E
- Canadian Pediatric Society. (2016). Age limits and adolescents. Retrieved from <http://www.cps.ca/documents/position/age-limits-adolescents>
- Ciao, A. C., Loth, K., & Neumark-Sztainer, D. (2014). Preventing eating disorder pathology: Common and unique features of successful eating disorders prevention programs. *Current Psychiatry Reports, 16*(7), 453. doi:10.1007/s11920-014-0453-0

- Collin, P., Power, K., Karatzias, T., Grierson, D., & Yellowlees, A. (2010). The effectiveness of, and predictors of response to, inpatient treatment of anorexia nervosa. *European Eating Disorders Review*, 18(6), 464-474.  
doi:10.1002/erv.1026
- Colton, A., & Pistrang, N. (2004). Adolescents' experiences of inpatient treatment for anorexia nervosa. *European Eating Disorders Review*, 12, 307-316.  
doi:10.1002/erv.587
- Costa, M. B., & Melnik, T. (2016). Effectiveness of psychosocial interventions in eating disorders: An overview of cochrane systematic reviews. *Einstein*, 14(2), 235-277.  
doi:10.1590/S1679-45082016RW3120
- Couturier, J., Kimber, M., Jack, S., Niccols, A., Van Blyderveen, S., & McVey, G. (2013). Understanding the uptake of family-based treatment for adolescents with anorexia nervosa: Therapist perspectives. *International Journal of Eating Disorders*, 46(2), 177-188. doi:10.1002/eat.22049
- Couturier, J., Kimber, M., Lock, J., Barwick, M., McVey, G., Findlay, S., . . . Woodford, T. (2015). Implementing highly specialized and evidence-based pediatric eating disorder treatment: Protocol for a mixed methods evaluation. *Implementation Science*, 10(40), 1-7. doi:10.1186/s13012-015-0231-3
- Couturier, J., Kimber, M., & Szatmari, P. (2013). Efficacy of family-based treatment for adolescents with eating disorders: A systematic review and meta-analysis. *International Journal of Eating Disorders*, 46(1), 3-11. doi:10.1002/eat.22042

- Cummings, M. M., Waller, D., Johnson, C., Bradley, K., Leatherwood, D., & Guzzetta, C. E. (2001). Developing and implementing a comprehensive program for children and adolescents with eating disorders. *Journal of Child and Adolescent Psychiatric Nursing, 14*(4), 167. doi:10.1111/j.1744-6171.2001.tb00310.x
- Dahlgren, C. L., Lask, B., Landro, N. I., & Ro, O. (2014). Developing and evaluating cognitive remediation therapy (CRT) for adolescents with anorexia nervosa: a feasibility study. *Clinical Child Psychology and Psychiatry, 19*(3), 476-487. doi:10.1177/1359104513489980
- Dahlgren, C. L., Lask, B., Landrø, N. I., & Rø, Ø. (2014). Patient and parental self-reports of executive functioning in a sample of young female adolescents with anorexia nervosa before and after cognitive remediation therapy. *European Eating Disorders Review, 22*(1), 45-52. doi:10.1002/erv.2265
- Dalle Grave, R., Calugi, S., El Ghoch, M., Conti, M., & Fairburn, C. G. (2014). Inpatient cognitive behavior therapy for adolescents with anorexia nervosa: immediate and longer-term effects. *Frontiers in psychiatry, 5*, 14. doi:10.3389/fpsy.2014.00014
- Dean, H. Y., Touyz, S. W., Rieger, E., & Thornton, C. E. (2008). Group motivational enhancement therapy as an adjunct to inpatient treatment for eating disorders: A preliminary study. *European Eating Disorders Review, 16*(4), 256-267. doi:10.1002/erv.851
- Depestele, L., Claes, L., Dierckx, E., Colman, R., Schoevaerts, K., & Lemmens, G. M. D. (2017). An adjunctive multi-family group intervention with or without patient participation during an inpatient treatment for adolescents with an eating disorder:

A pilot study. *European Eating Disorders Review*, 25(6), 570-578.

doi:10.1002/erv.2556

Dimitropoulos, G., Landers, A. L., Freeman, V., Novick, J., Garber, A., & Le Grange, D.

(2018). Open trial of family-based treatment of anorexia nervosa for transition age youth. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*,

27(1), 50-61. doi:10.1186%2Fs40337-015-0037-3

DSM Library. (2013). Feeding and Eating Disorders. Retrieved from

<http://dsm.psychiatryonline.org/doi/full/10.1176/appi.books.9780890425596.dsm>

[10](#)

Dunn, E. C., Neighbors, C., & Larimer, M. E. (2006). Motivational enhancement therapy

and self-help treatment for binge eaters. *Psychology of Addictive Behaviors*,

20(1), 44-52. doi:10.1037/0893-164X.20.1.44

Espie, J., & Eisler, I. (2015). Focus on anorexia nervosa: Modern psychological treatment

and guidelines for the adolescent patient. *Adolescent Health, Medicine and*

*Therapeutics*, 6, 9-16. doi:10.2147/AHMT.S70300

Fennig, S., Brunstein Klomek, A., Shahar, B., Sarel-Michnik, Z., & Hadas, A. (2017).

Inpatient treatment has no impact on the core thoughts and perceptions in

adolescents with anorexia nervosa. *Early Intervention in Psychiatry*, 11(3), 200-

207. doi:10.1111/eip.12234

Garber, A. K., Mauldin, K., Michihata, N., Buckelew, S. M., Shafer, M. A., & Moscicki,

A. B. (2013). Higher calorie diets increase rate of weight gain and shorten

- hospital stay in hospitalized adolescents with anorexia nervosa. *Journal of Adolescent Health*, 53(5), 579-584. doi:10.1016/j.jadohealth.2013.07.014
- Giombini, L., Moynihan, J., Turco, M., & Nesbitt, S. (2017). Evaluation of individual cognitive remediation therapy (CRT) for the treatment of young people with anorexia nervosa. *Eating and Weight Disorders*, 22(4), 667-673. doi:10.1007/s40519-016-0322-4
- Gisladdottir, M., Treasure, J., & Svavarsdottir, E. K. (2017). Effectiveness of therapeutic conversation intervention among caregivers of people with eating disorders: quasi-experimental design. *Journal of Clinical Nursing*, 26(5-6), 735-750. doi:10.1111/jocn.13412
- Goodier, G. H., McCormack, J., Egan, S. J., Watson, H. J., Hoiles, K. J., Todd, G., & Treasure, J. (2014). Parent skills training treatment for parents of children and adolescents with eating disorders: A qualitative study. *International Journal of Eating Disorders*, 47(4), 368-375. doi:10.1002/eat.22224
- Government of Canada. (2011). Pediatric and Adolescent Care - Chapter 19 - Adolescent Health Retrieved from <https://www.canada.ca/en/indigenous-services-canada/services/first-nations-inuit-health/health-care-services/nursing/clinical-practice-guidelines-nurses-primary-care/pediatric-adolescent-care/chapter-19-adolescent-health.html#a1>
- Gowers, & Bryant-Waugh, R. (2004). Management of child and adolescent eating disorders: the current evidence base and future directions. *Journal of Child Psychology and Psychiatry*, 45(1), 63-83. doi:10.1046/j.0021-9630.2003.00309.x

- Gowers, S., Clark, A., Roberts, C., Griffiths, A., Edwards, V., Bryan, C., . . . Barrett, B. (2007). Clinical effectiveness of treatments for anorexia nervosa in adolescents. *British Journal of Psychiatry*, 191, 427-435. doi:10.1192/bjp.bp.107.036764
- Gueguen, J., Piot, M. A., Orri, M., Gutierrez, A., Le Moan, J., Berthoz, S., . . . Godart, N. (2017). Group qigong for adolescent inpatients with anorexia nervosa: Incentives and barriers. *PloS One*, 12(2), e0170885. doi:10.1371/journal.pone.0170885
- Halmi, K. (2009). Salient components of a comprehensive service for eating disorders. *World Psychiatry*, 8(3), 150-155. doi:10.1002/j.2051-5545.2009.tb00235.x
- Halvorsen, I., Reas, D. L., Nilsen, J. V., & Rø, Ø. (2018). Naturalistic outcome of family-based inpatient treatment for adolescents with anorexia nervosa. *European Eating Disorders Review*, 26(2), 141-145. doi:10.1002/erv.2572
- Harken, W., Maxwell, J., Hainline, M., Pollack, L., & Roberts, C. (2017). Perceptions of caring for adolescents with eating disorders hospitalized on a general pediatric unit. *Journal of Pediatric Nursing*, 34, e34-e41. doi:10.1016/j.pedn.2017.02.008
- Harrison, A., Al-Khairulla, H., & Kikoler, M. (2016). The feasibility, acceptability and possible benefit of a positive psychology intervention group in an adolescent inpatient eating disorder service. *The Journal of Positive Psychology*, 11(5), 449-459. doi:10.1080/17439760.2015.1117125
- Harrison, A., Stavri, P., Ormond, L., McEnemy, F., Akyol, D., Qureshi, A., & Al-Khairulla, H. (2018). Cognitive remediation therapy for adolescent inpatients with severe and complex anorexia nervosa: A treatment trial. *European Eating Disorders Review*, 26(3), 230-240. doi:10.1002/erv.2584

- Hay, P. (2004). Australian and new zealand clinical practice guidelines for the treatment of anorexia nervosa. *Australian and New Zealand Journal of Psychiatry*, 38, 659-670. doi:10.1080/j.1440-1614.2004.01449.x
- Hay, P., Claudino, A., Smith, C., Touyz, S., Lujic, S., & Madden, S. (2013). Inpatient versus outpatient care, partial hospitalisation and wait-list for people with eating disorders (Publication no. 10.1002/14651858.CD010827).
- Herbrich, L., van Noort, B., Pfeiffer, E., Lehmkuhl, U., Winter, S., & Kappel, V. (2017). Follow-up assessment of cognitive remediation therapy in adolescent anorexia nervosa: A pilot study. *European Eating Disorders Review*, 25(2), 104-113. doi:10.1002/erv.2501
- Hillen, S., Dempfle, A., Seitz, J., Herpertz-Dahlmann, B., & Bühren, K. (2015). Motivation to change and perceptions of the admission process with respect to outcome in adolescent anorexia nervosa. *BMC Psychiatry*, 15, 140. doi:10.1186/s12888-015-0516-8
- Jaworska, N., & MacQueen, G. (2015). Adolescence as a unique developmental period. *Journal of Psychiatry and Neuroscience*, 40(5), 291-291. doi:10.1503/jpn.150268
- Katzman, D., Madden, S., Nicholls, D., Mawjee, K., & Norris, M. (2017). From questions to answers: Examining the role of pediatric surveillance units in eating disorder research. *International Journal of Eating Disorders*, 50, 259-265. doi:10.1002/eat.22663
- Kezelman, S., Rhodes, P., Hunt, C., Anderson, G., Clarke, S., Crosby, R. D., & Touyz, S. (2016). Adolescent patients' perspectives on rapid-refeeding: A prospective

- qualitative study of an inpatient population. *Advances in Eating Disorders*, 4(3), 277-292. doi:10.1080/21662630.2016.1202124
- Lafrance Robinson, A., & Kosmerly, S. (2015). The influence of clinician emotion on decisions in child and adolescent eating disorder treatment: A survey of self and others. *Eating disorders*, 23(2), 163-176. doi:10.1080/10640266.2014.976107
- Le Grange, D., & Gelman, T. (1998). Patients' perspective of treatment in eating disorders: a preliminary study. *South African Journal of Psychology*, 28(3), 182-186. doi:10.1177%2F008124639802800309
- Linardon, J., Brennan, L., & de la Piedad Garcia, X. (2016). Rapid response to eating disorder treatment: A systematic review and meta-analysis. *International Journal of Eating Disorders*. doi:10.1002/eat.22595
- Lock, J., Agras, W. S., Bryson, S. W., Brandt, H., Halmi, K. A., Kaye, W., . . . Jo, B. (2016). Does family-based treatment reduce the need for hospitalization in adolescent anorexia nervosa? *International Journal of Eating Disorders*, 49(9), 891-894. doi:10.1002/eat.22536
- Lock, J., & Gowers, S. (2005). Effective interventions for adolescents with anorexia nervosa. *Journal of Mental Health*, 14(6), 599-610. doi:10.1080/09638230500400324
- Madden, S., Miskovic-Wheatley, J., Clarke, S., Touyz, S., Hay, P., & Kohn, M. R. (2015). Outcomes of a rapid refeeding protocol in adolescent anorexia nervosa. *Journal of Eating Disorders*, 3, 8. doi:10.1186/s40337-015-0047-1



- Madden, S., Miskovic-Wheatley, J., Wallis, A., Kohn, M., Hay, P., & Touyz, S. (2015). Early weight gain in family-based treatment predicts greater weight gain and remission at the end of treatment and remission at 12-month follow-up in adolescent anorexia nervosa. *International Journal of Eating Disorders*, 48(7), 919-922. doi:10.1002/eat.22414
- Madden, S., Miskovic-Wheatley, J., Wallis, A., Kohn, M., Lock, J., Le Grange, D., . . . Touyz, S. (2015). A randomized controlled trial of in-patient treatment for anorexia nervosa in medically unstable adolescents. *Psychological Medicine*, 45(2), 415-427. doi:10.1017/S0033291714001573
- Mahr, F., Pantea, F., Bixler, E. O., Domen, R. E., Moser, E. M., Nadeem, T., . . . Halmi, K. A. (2015). A national survey of eating disorder training. *International Journal of Eating Disorders*, 48(4), 443-445. doi:10.1002/eat.22335
- Malmendier-Muehlschlegel, A., Rosewall, J. K., Smith, J. G., Hugo, P., & Lask, B. (2016). Quality of friendships and motivation to change in adolescents with anorexia nervosa. *Eating Behaviors*, 22, 170-174. doi:10.1016/j.eatbeh.2016.06.010
- Månsson, J., Parling, T., & Swenne, I. (2016). Favorable effects of clearly defined interventions by parents at the start of treatment of adolescents with restrictive eating disorders. *International Journal of Eating Disorders*, 49(1), 92-97. doi:10.1002/eat.22379

- Matthews, A., Lenz, K. R., Peugh, J., Copps, E. C., & Peterson, C. M. (2018). Caregiver burden and illness perceptions in caregivers of medically hospitalized youth with anorexia nervosa. *Eating Behaviors*, 29, 14-18. doi:10.1016/j.eatbeh.2018.01.003
- Naab, S., Schlegl, S., Korte, A., Heuser, J., Fumi, M., Fichter, M., . . . Voderholzer, U. (2013). Effectiveness of a multimodal inpatient treatment for adolescents with anorexia nervosa in comparison with adults: An analysis of a specialized inpatient setting *Eating and Weight Disorders*, 18(2), 167-173. doi:10.1007/s40519-013-0029-8
- Nishizono-Maher, A., Escobar-Koch, T., Ringwood, S., Banker, J., van Furth, E., & Schmidt, U. (2011). What are the top five essential features of a high quality eating disorder service? A comparison of the views of US and UK eating disorder sufferers, carers and health professionals. *European Eating Disorders Review*, 19(5), 411-416. doi:10.1002/erv.1062
- Noetel, M., Miskovic-Wheatley, J., Costa, D., Crosby, R. D., Hay, P., Kohn, M., . . . Touyz, S. (2016). Exercise for the compulsive exercisers? An exploratory study in adolescent inpatients with anorexia nervosa. *Advances in Eating Disorders*, 4(3), 264-276. doi:10.1080/21662630.2016.1202123
- Norris, M., Strike, M., Pinhas, L., Gomez, R., Elliott, A., Ferguson, P., & Gusella, J. (2013). The canadian eating disorder program survey - exploring intensive treatment programs for youth with eating disorders. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 22(4), 310-316.

- O'Reilly, G. A., Cook, L., Spruijt-Metz, D., & Black, D. S. (2014). Mindfulness-based interventions for obesity-related eating behaviours: A literature review. *Obesity Reviews*, *15*(6), 453-461. doi:10.1111/obr.12156
- O'Connor, G., Nicholls, D., Hudson, L., & Singhal, A. (2016). Refeeding low weight hospitalized adolescents with norexia nervosa. *Nutrition in Clinical Practice*, *31*(5), 681-689. doi:10.1177/0884533615627267
- Peake, K. J., Limbert, C., & Whitehead, L. (2005). An evaluation of the oxford adult eating disorders service between 1994 and 2002. *European Eating Disorders Review*, *13*, 427-435. doi:10.1002/erv.627
- Peterson, C. M., Tissot, A. M., Matthews, A., Hillman, J. B., Peugh, J. L., Rawers, E., . . . Mitan, L. (2016). Impact of short-term refeeding on appetite and meal experiences in new onset adolescent eating disorders. *Appetite*, *105*, 298-305. doi:10.1016/j.appet.2016.05.037
- Pettersson, C., Tubic, B., Svedlund, A., Magnusson, P., Ellegard, L., Swolin-Eide, D., & Forslund, H. B. (2016). Description of an intensive nutrition therapy in hospitalized adolescents with anorexia nervosa. *Eating Behaviors*, *21*, 172-178. doi:10.1016/j.eatbeh.2016.03.014
- Polit, D. F., & Beck, C. T. (2017). *Nursing research generating and assessing evidence for nursing practice (Tenth ed.)*. Philadelphia: Wolters Kluwer.
- Raveneau, G., Feinstein, R., Rosen, L. M., & Fisher, M. (2014). Attitudes and knowledge levels of nurses and residents caring for adolescents with an eating disorder.

*International Journal of Adolescent Medicine and Health*, 26(1), 131-136.

doi:10.1515/ijamh-2013-0015

Reid, M., Williams, S., & Burr, J. (2010). Perspectives on eating disorders and service provision: A qualitative study of healthcare professionals. *European Eating Disorders Review*, 18(5), 390-398. doi:10.1002/erv.976

Reid, M., Williams, S., & Hammersley, R. (2009). Managing eating disorder patients in primary care in the UK: a qualitative study. *Eating disorders*, 18(1), 1-9. doi:10.1080/10640260903439441

Robin, A., Gilroy, M., & Dennis, A. (1998). Treatment of eating disorders in children and adolescents. *Clinical Psychology Review*, 18(4), 421-446. doi:10.1016/S0272-7358(98)00013-0

Rocks, T., Pelly, F., & Wilkinson, P. (2014). Nutritional management of anorexia nervosa in children and adolescent inpatients: The current practice of Australian dietitians. *Nutrition & Dietetics*, 71(2), 100-107. doi:10.1111/1747-0080.12058

Rothschild-Yakar, L., Lacoua, L., & Stein, D. (2013). Changes in patient measures as predictors of therapists' ratings of treatment collaboration and change in eating disorder subgroups. *Assessment*, 20(6), 752-763. doi:10.1177/1073191111415366

Schlegl, S., Diedrich, A., Neumayr, C., Fumi, M., Naab, S., & Voderholzer, U. (2016). Inpatient treatment for adolescents with anorexia nervosa: Clinical significance and predictors of treatment outcome. *European Eating Disorders Review*, 24(3), 214-222. doi:10.1002/erv.2416

- Shaw, H., & Stice, E. (2016). The implementation of evidence-based eating disorder prevention programs. *Eating disorders*, 24(1), 71-78.  
doi:10.1080/10640266.2015.1113832
- Shisslak, C. M., Gray, N., & Crago, M. (1989). Health care professionals' reactions to working with eating disorder patients. *International Journal of Eating Disorders*, 6(8), 689-694.
- Stice, E., & Shaw, H. (2004). Eating disorder prevention programs: a meta-analytic review. *Psychological Bulletin*, 130(2), 206-227. doi:10.1037/0033-2909.130.2.206
- The Joanna Briggs Institute. (2017). Critical Appraisal Tools. Retrieved from <https://joannabriggs.org/research/critical-appraisal-tools.html>
- The National Institute for Health and Care Excellence. (2004). EDs in over 8s: management. *National Institute for Health and Care Excellence*, 1-31.
- Thompson-Brenner, H., Satir, D. A., Franko, D. L., & Herzog, D. B. (2012). Clinician reactions to patients with eating disorders: A review of the literature. *Psychiatric Services*, 63(1), 73-78. doi:10.1176/appi.ps.201100050
- Tusaie, K. R., & Fitzpatrick, J. J. (2013). *Advanced Practice Psychiatric Nursing*. New York: Springer Publishing Company.
- Vandereycken, W. (1985). Inpatient treatment of anorexia nervosa: Some research-guided changes. *Journal of Psychiatric Research*, 19(2), 413-422.  
doi:10.1016/0022-3956(85)90048-2

- Wanden-Berghe, R. G., Sanz-Valero, J., & Wanden-Berghe, C. (2010). The application of mindfulness to eating disorders treatment: a systematic review. *Eating disorders*, 19(1), 34-48. doi:10.1080/10640266.2011.533604
- Wonderlich-Tierney, A. L., & Vander Wal, J. S. (2010). The effects of social support and coping on the relationship between social anxiety and eating disorders. *Eating Behaviors*, 11(2), 85-91. doi:10.1016/j.eatbeh.2009.10.002
- World Health Organization. (1986). *Young people's health - a challenge for society*. Retrieved from Switzerland:
- Zugai, J., Stein-Parbury, J., & Roche, M. (2013). Effective nursing care of adolescents with anorexia nervosa: a consumer perspective. *Journal of Clinical Nursing*, 22(13-14), 2020-2029. doi:10.1111/jocn.12182
- Zugai, J., Stein-Parbury, J., & Roche, M. (2018). The nature of the therapeutic alliance between nurses and consumers with anorexia nervosa in the inpatient setting: A mixed-methods study. *Journal of Clinical Nursing*, 27(1/2), 416-426. doi:10.1111/jocn.13944

## APPENDIX A: CRITICAL APPRAISAL OF STUDIES

Table 1.0. *Overview of included studies*

| Theme               | Study                 | Type                        | Method       | Main Aim & Overall Findings   |
|---------------------|-----------------------|-----------------------------|--------------|---|
| Inpatient treatment | Madden et al. (2015)  | Randomized controlled trial | Quantitative | While comparing the effectiveness of different inpatient treatments in medically unstable adolescents, it was found that a longer initial hospitalization aimed at weight restoration does not reduce the need for hospitalization.   |
|                     | Avnon et al. (2017)   | Cohort study                | Quantitative | With weight restoration being the prime goal of inpatient care and weight-related variables being crucial to relapse prevention, it was found that weight restoration curves are associated with a greater risk for re-hospitalization relative to other weight restoration patterns.   |
|                     | Schlegl et al. (2015) | Cohort study                | Quantitative | To evaluate the clinical significance of treatment outcome and predictors of change in adolescents with anorexia nervosa, it was found that effectiveness of inpatient treatment for adolescents with anorexia nervosa is associated with improvements in primary symptoms such as weight gain, eating disorder symptoms and general psychopathology.         |
|                     | Naab et al. (2013)    | Cohort study                | Quantitative | To obtain additional detailed information about the effectiveness of a specialized multimodal inpatient treatment for adolescents with anorexia nervosa, it was found that such specialized multimodal inpatient treatment results in improvements on a wide range of variables, such as, eating disorder symptoms and general psychopathology of depression. |
|                     | Bergh et al. (2013)   | Cohort study                | Quantitative | To determine effective treatment of eating disorders by looking across various eating disorder programs, it was found that there is no agreement on how to treat the psychiatric symptoms associated with eating disorders, and in fact, standard psychiatric   |

|  |                       |                   |             |   |
|--|-----------------------|-------------------|-------------|---|
|  |                       |                   |             | care for anorexia and bulimia is anything but standardized.   |
|  | Zugai et al. (2013)   | Descriptive study | Qualitative | To establish how nurses ensure weight gain and a positive inpatient experience for the treatment of adolescents with anorexia nervosa, it was found that there is a preference for nurses to have clear perspectives on how to ensure both weight gain and a positive inpatient experience among adolescents with anorexia nervosa. This study indicates that the process of weight gain may be enhanced when it is combined with the process of therapeutic engagement.  |
|  | Harken et al. (2017)  | Descriptive study | Qualitative | While describing perceptions of caring for adolescents with eating disorder among various health care provider, it was found that with appropriate education, training, and specialized multidisciplinary team support, nursing staff enjoy working with adolescents with eating disorders.   |
|  | Basker et al. (2013)  | Descriptive study | Qualitative | While analyzing the clinical profile of eating disorders among adolescent patients, this study concluded that a multidisciplinary team approach and family-based therapy form the cornerstones of management for adolescents with eating disorders.   |
|  | Beukers et al. (2015) | Descriptive study | Qualitative | In describing nursing interventions aimed at restoring normal eating behaviour in patients with anorexia nervosa, it was found that a directive attitude aimed at promoting behavioural change with a combination of empathy and understanding is beneficial in treatment. Findings contribute to healthcare professionals training programmes and guidelines by enhancing the knowledge of nursing interventions and attitudes when attempting to restore normal eating behaviour during treatment of adolescent patients with anorexia nervosa. |



|                        |                             |   |               |  |
|------------------------|-----------------------------|---|---------------|--|
|                        | Bravender et al. (2017)     | Cohort study (Quantitative) and Descriptive study (Qualitative) | Mixed methods | To describe parent and patient impressions of inpatient medical stabilization, it was found that inpatient medical stabilization for adolescent eating behaviours may play an important role in addressing medical complications, while identifying the patient and family's need for ongoing treatment.   |
| Family-based treatment | Lock et al. (2016)          | Randomized parallel comparison                                  | Quantitative  | To explore hospitalization use by adolescent anorexia nervosa patients during treatment by examining the process of hospitalization that compared Family-based treatment to Systemic Family Therapy to describe patterns of hospital use, hospital effects on outcome, and predictors and moderators of hospitalization, it was found that there is a difference in timing of hospitalization with family-based treatment compared to systematic family therapy. |
|                        | Dimitropoulos et al. (2018) | Cohort study  | Quantitative  | To assess the feasibility and acceptability of a manualized model of Family-based treatment adapted for transition aged youth, it was found that Family-based treatment adapted for transition aged youth is feasible in specialized paediatric and adult programs and acceptable to study therapists and to transition aged youth and their families.   |
|                        | Halvorsen et al. (2018)     | Cohort study  | Quantitative  | To investigate the naturalistic outcome of inpatient Family-based treatment at a tertiary eating disorder unit for adolescents in terms of weight, eating disorder symptoms, comorbid disorders and treatment received during the follow-up period, it was found that inpatient family-based treatment for patients with anorexia nervosa may be a promising treatment approach but should be investigated further.  |
|                        | Madden et al. (2015)        | Randomized controlled trial                                     | Quantitative  | To determine whether early weight gain in family-based treatment predicted remission at  |

|                               |                          |                             |              |   |
|-------------------------------|--------------------------|-----------------------------|--------------|---|
|                               |                          |                             |              | both end of family-based treatment and 12-month follow-up in adolescents with anorexia nervosa, it was found that early weight gain in treatment predicted higher expected body weight at the end of treatment, which is associated with recovery from anorexia nervosa psychopathology.  |
|                               | Couturier et al. (2013)  | Randomized controlled trial | Qualitative  | To understand the uptake of Family-based treatment for adolescents with anorexia nervosa, the development of context-specific training and administrative processes for the implementation of evidence-based practice and Family-based treatment is warranted.  |
| Cognitive behavioural therapy | DalleGrave et al. (2014) | Cohort study                | Quantitative | To establish immediate and long-term effects of a novel inpatient program for adolescents, it was found that patients maintained the marked improvements in weight, eating disorder psychopathology, and general psychiatric features achieved during treatment when certain aspects of conventional inpatient treatment programs were modified with the aim of improving overall outcomes and reducing relapse at discharge.   |
| Cognitive remediation therapy | Harrison et al. (2018)   | Cohort study                | Quantitative | To enhance the understanding of benefits around Cognitive remediation therapy, it found that a low intensity brief cognitive intervention, which was acceptable to severely unwell individuals with anorexia nervosa could be a useful adjunct to medical stabilisation and provide cognitive skills and a positive experience of engagement with treatment to enable the commencement or continuation of more intensive psychotherapies in the community, aiding reduced admission duration through increasing motivation to change. |
|                               | Giombini et al. (2017)   | Cohort study                | Quantitative | To evaluate the use of Cognitive remediation therapy for young people with anorexia nervosa, it found that cognitive remediation  |

|                   |                          |              |              |  |
|-------------------|--------------------------|--------------|--------------|--|
|                   |                          |              |              | therapy promotes measurable improvements in the domains of both cognitive and behavioural flexibility, central coherence, an emotional control.  |
|                   | Herbrich et al. (2017)   | Cohort study | Quantitative | To assess the effects of Cognitive remediation therapy 6 months after completing 10 sessions of Cognitive remediation therapy in adolescents with anorexia nervosa, it was found that there were no significant group differences.   |
|                   | Dahlgren et al. (2014a)  | Cohort study | Quantitative | To test the feasibility of individually tailored and delivered Cognitive remediation therapy for young females with anorexia nervosa, it was found that the intervention was feasible with regards to, the recruitment strategy, the structure of delivery, the materials, and the acceptability for clinicians involved in the study.   |
|                   | Dahlgren et al. (2014b)  | Cohort study | Quantitative | To investigate the patient and parental self-reports of executive functioning before and after Cognitive remediation therapy among adolescents with anorexia nervosa, it was found that there is a clear inconsistency between patients and parents in terms of clinical significance before and after Cognitive remediation therapy, which calls for finding a balance between generalizable results from larger group analyses and individual assessment specifics as a potential method to evaluate the potency of Cognitive remediation therapy. |
| Nutrition therapy | Pettersson et al. (2016) | Cohort study | Quantitative | In describing a 12-week intensive nutrition therapy for hospitalized anorexia nervosa adolescents and young adults in terms of energy balance, nutrient intake, body weight, body composition and food related anxiety, a structured behavioral treatment program, with a standardized, non-selective menu was implemented, where it was found that a steady weight  |

|                     |                        |                             |              |  |
|---------------------|------------------------|-----------------------------|--------------|--|
|                     |                        |                             |              | gain and increased body mass index due to increased total body fat mass over the treatment period, in addition to improved food attitude and less food related anxiety.  |
|                     | Rocks et al. (2014)    | Cohort study                | Quantitative | To describe the reported practices of Australian dietitians in the nutritional management of anorexia nervosa in children and adolescent inpatients, it was found that oral meal administration is considered the best approach to re-feed patients.   |
|                     | Garber et al. (2013)   | Cohort study                | Qualitative  | While comparing higher and lower calorie diets, it was found that higher calorie meal-based approaches are more feasible for moderately malnourished patients. For more severely malnourished chronically ill patients, enteral feedings have shown good outcomes, and may in theory attenuate the high refeeding risk in these patients by avoiding the wide glucose and insulin excursions associated with meal boluses.   |
| Refeeding treatment | O'Connor et al. (2016) | Randomized controlled trial | Quantitative | To investigate the optimal regime for refeeding low weight hospitalized adolescents with anorexia nervosa, it was found that refeeding low weight hospitalized adolescents with anorexia nervosa at an initial energy intake of 1200kcal/d compared with 500 kcal/d elicited greater weight gain without increasing the incidence or severity of refeeding hypophosphatemia. These findings suggest that refeeding at a higher energy intake may be advantageous in the physiologic recovery of most low weight adolescents with anorexia nervosa. |
|                     | Madden et al. (2015)   | Cohort study                | Quantitative | To report refeeding outcomes for adolescent patients with anorexia nervosa using a standardised refeeding regime involving supported oral meals and nasogastric feeding with sufficient calories to initiate and   |

|                  |                        |                   |              |  |
|------------------|------------------------|-------------------|--------------|--|
|                  |                        |                   |              | sustain weight gain from the outset of treatment, it was found that this refeeding protocol resulted in immediate weight gain with no indicators of refeeding syndrome.  |
|                  | Peterson et al. (2016) | Cohort study      | Quantitative | To evaluate the hunger, fullness, smell, and taste responses in adolescents with newly-diagnosed eating disorders, an improvement in fullness cues for the eating disorder-refed group compared to the eating disorder-admission group immediately following a meal was found, which enable clinicians an opportunity to combat aversive learning and discomfort associated with fullness.   |
|                  | Kezelman et al. (2016) | Descriptive study | Qualitative  | To examine the psychological experience over the course of an inpatient treatment implementing rapid-refeeding protocol for adolescent patients with anorexia nervosa, it was found that a multidimensional process inclusive of reconciling with the diagnosis of anorexia nervosa, adjusting to treatment, and reflecting and integrating Findings from this study provide some insight into why gaps in psychological and physiological recovery may undermine long-term clinical outcomes. Patient experiences highlighted several psychological features that may be negatively associated with rapid weight gain. Overall, findings from this study have important implications for developing an understanding of the individual's experience during acute nutritional rehabilitation of AN in adolescents. |
| Exercise therapy | Noetal et al. (2016)   | Cohort study      | Quantitative | To explore whether exercise produced acute psychological benefits for adolescent inpatients receiving treatment for anorexia, it was found that higher compulsive exercise features were associated with significantly greater decreases in anxious affect. Clinicians should  |

|                       |                         |                    |              |   |
|-----------------------|-------------------------|--------------------|--------------|---|
|                       |                         |                    |              | be encouraged and supported to manage exercise behaviours as opposed to eliminating them to effectively reduce the risks of covert, unmanaged forms of exercise while maximising the gains that exercise has to offer.  |
| Group therapy         | Depestele et al. (2017) | Case control study | Quantitative | To examine whether multi-family therapy or multi-parent therapy differently benefits families of patients with or without binge-purging behaviours, it was found that family outcome measures showed improvement in family functioning according to the patients and fathers but not to the mothers, across both interventions and both eating disorder subtypes.   |
| Positive psychology   | Harrison et al. (2016)  | Cohort study       | Quantitative | To develop and implement a five session 'Positivity Group' using positive psychology interventions in adolescent eating disorder inpatient service, it was found that 75% of patients reported meaningful improvement in subjective happiness and 87.5% in life satisfaction.   |
| Qigong therapy        | Gueguen et al. (2017)   | Descriptive study  | Qualitative  | While evaluating the use of qigong therapy (a mind-body intervention) for adolescents with anorexia nervosa, it was found that Qigong therapy has helped to identify incentives, barriers, and perceived effects and risks that may be encountered in other mind-body therapies.  |
| Caregiver perspective | Matthews et al. (2018)  | Cohort study       | Quantitative | To examine the relation between caregiver illness perceptions about anorexia nervosa, it was found that caregiver burden is associated with poor mental health, lower quality of life, and experiencing negative aspects of care more intensely. This study supports the relation between negative illness beliefs about anorexia nervosa and caregiver burden, particularly related to caregiver beliefs about consequences of anorexia nervosa. |

|  |                                     |                   |              |  |
|--|-------------------------------------|-------------------|--------------|--|
|  | Gisladdottir & Svavarsdottir (2017) | Cohort study      | Quantitative | To evaluate the effectiveness of therapeutic conversation intervention in group and caregiver sessions on the supporting role of caregivers, it was found that caregivers perceived lower behavioural difficulties of themselves and patient symptom behaviours.   |
|  | Lafrance & Kosmerly (2015)          | Cohort study      | Quantitative | In examining clinicians' perceptions of the negative influence of emotions on clinical decisions when working with child and adolescent eating disorders, it was found that some clinicians believe that emotions can negatively affect the treatment of eating disorders, particularly when making decisions regarding family involvement.  |
|  | Rothschild-Yakar & Stein (2013)     | Cohort study      | Quantitative | While analyzing how patients' perspectives or patients' measures relate to psychodynamic therapists' perspectives, as well as symptomatic and behavioral changes, it was found that the best predictor of higher outcome ratings by the therapists for inpatients with binge/purging symptoms was related to their ability to regulate their affects. Further, therapists identified in both eating disorder subtypes enduring characteristics requiring modification, namely, constricted affective life in patients with anorexia nervosa and affective dysregulation in patients with binge-purging symptoms, alongside changes in distress symptoms, enable a greater collaboration with treatment and a more favorable outcome. |
|  | Goodier et al. (2014)               | Descriptive study | Qualitative  | To examine the experience of parents of children with eating disorders after having participated in a skills-based training intervention, it was found that this intervention was  |

|                     |  |                   |              |   |
|---------------------|--|-------------------|--------------|---|
|                     |  |                   |              | acceptable as it improved knowledge and had benefits for the caregiving experience. Specifically, it is effective at helping parents manage their children's illness, and improved communication and family dynamics. Parents reported that the intervention provided them with an opportunity to discuss their experiences and learn from other parents at different stages of the eating disorder.  |
|                     | Raveneau et al. (2014)                 | Descriptive study | Qualitative  | To determine the attitudes of nurses and pediatric residents towards adolescents and young adults with eating disorders, it was found that eating disorder patients admitted to an inpatient medical unit tend to evoke strong negative feelings within providers. Programs to improve communication and coordinate care are needed to relieve frustration and reduce tension in providers who care for individuals with an eating disorder.  |
| Patient perspective | Fenning et al. (2017)                  | Cohort study      | Quantitative | To examine changes in core thoughts and perceptions of adolescent anorexia nervosa during inpatient weight restoration, it was found that that body mass index percentile during hospitalization for adolescent anorexia nervosa were not associated with significant improvement in core anorexic thoughts and perceptions, such as body dissatisfaction, drive for thinness, weight concern and shape concern. Instead, an intensive, open inpatient intervention for medically stabilized adolescents with anorexia nervosa appears to have a significant nutritional/medical impact but only a limited effect on core anorexic thoughts and perceptions change. |
|                     | Malmendier-Muehlschlegel et al. (2016) | Cohort study      | Quantitative | To explore the relationship between quality of friendships, motivation to change and peer   |



|                      |                             |   |               |   |
|----------------------|-----------------------------|---|---------------|---|
|                      |                             |   |               | support among young people receiving inpatient treatment for anorexia nervosa, it was found that friendships were not related to becoming more entrenched with anorexia nervosa, which is considered surprising given peer influence has been found to impact eating pathology in hospital environments.  |
|                      | Hillen et al. (2015)        | Cohort study  | Quantitative  | To evaluate (1) an association between patient characteristics, motivation to change at admission and perception of the admission process, (2) whether the motivation to change varied over the course of treatment, and (3) whether motivation to change at admission had an impact on treatment outcomes with respect to weekly weight gain and improvements in eating disorder specific psychopathology, it was found that first time greater motivation to change at the beginning of treatment resulted in a faster weekly weight gain in adolescent patients with anorexia nervosa during hospital treatment. |
| Therapeutic alliance | Bourion-Bedes et al. (2013) | Cohort study  | Quantitative  | To examine patient, therapist, and parent therapeutic alliance ratings over time between these individuals, it was found that the better perception of early therapeutic alliance was significantly related to shorter time to achieve the target weight in patients with anorexia nervosa.   |
|                      | Zugai et al. (2018)         | Cohort study (Quantitative) and Descriptive study (Qualitative) | Mixed methods | To develop a greater understanding of the nature of the inpatient therapeutic alliance between nurses and consumers with anorexia nervosa, it was found that nurses must recognize and harness the therapeutic potential of their potential of intimacy and power in the inpatient setting; a maternalistic approach may be an effective nursing approach. Overall, the integration of the therapeutic  |

|  |  |  |  |   |
|--|--|--|--|---|
|  |  |  |  | alliance concept in practice is dependent on the availability of appropriate resources, training and structured supervision for nurses. |
|--|--|--|--|---|

Table 1.1. *Assessment of methodological quality of randomized controlled trials*

| Theme                  | Citation               | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9  | Q10 | Q11 | Q12 | Q13 | Total (%) |
|------------------------|------------------------|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----------|
| Inpatient treatment    | Madden et al. (2015)   | Y  | Y  | Y  | Y  | U  | U  | Y  | Y  | Y   | Y   | Y   | Y   | Y   | 85        |
| Family-based treatment | Lock et al. (2016)     | Y  | U  | Y  | U  | U  | U  | U  | U  | Y   | Y   | Y   | Y   | Y   | 54        |
|                        | Madden et al. (2015)   | U  | U  | U  | U  | U  | U  | U  | Y  | Y   | Y   | Y   | Y   | Y   | 46        |
| Refeeding treatment    | O'Connor et al. (2016) | Y  | U  | Y  | U  | U  | U  | U  | Y  | Y   | Y   | Y   | Y   | Y   | 82        |
| Total (%)              |                        | 75 | 25 | 25 | 25 | 0  | 0  | 25 | 75 | 100 | 100 | 100 | 100 | 100 |           |

Y, yes; N, no; U, unclear.

Q1: Was true randomization used for assignment of participants to treatment groups? Q2: Was allocation to treatment groups concealed? Q3: Were treatment groups similar at the baseline? Q4: Were participants blind to treatment assignment? Q5: Were those delivering treatment blind to treatment assignment? Q6: Were outcomes assessors blind to treatment assignment? Q7: Were treatment groups treated identically other than the intervention of interest? Q8: Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed? Q9: Were participants analyzed in the groups to which they were randomized? Q10: Were outcomes measured in the same way for treatment groups? Q11: Were outcomes measured in a reliable way? Q12: Was appropriate statistical analysis used? Q13: Was the trial design appropriate, and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?

Table 1.2. *Assessment of methodological quality of cohort studies*

| Theme                         | Citation                           | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Total (%) |
|-------------------------------|------------------------------------|----|----|----|----|----|----|----|----|----|-----|-----|-----------|
| Inpatient treatment           | Avnon et al. (2017)                | Y  | Y  | Y  | N  | Y  | Y  | Y  | U  | U  | N   | Y   | 64        |
|                               | Schlegl et al. (2015)              | N  | N  | Y  | N  | N  | Y  | Y  | Y  | N  | Y   | Y   | 55        |
|                               | Naab et al. (2013)                 | N  | N  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 36        |
|                               | Bergh et al. (2013)                | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | Y   | Y   | 55        |
|                               | Bravender et al. (2017)            | Y  | Y  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | U   | 55        |
| Family-based treatment        | Dimitropoulos et al. (2018)        | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | Y   | Y   | 55        |
|                               | Halvorsen et al. (2018)            | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | Y   | Y   | 55        |
| Cognitive behavioural therapy | DalleGrave et al. (2014)           | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | Y   | 45        |
| Cognitive remediation therapy | Harrison et al. (2018)             | Y  | Y  | Y  | Y  | N  | Y  | Y  | N  | N  | N   | Y   | 64        |
|                               | Giombini et al. (2017)             | N  | N  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 36        |
|                               | Herbrich et al. (2017)             | Y  | Y  | Y  | N  | N  | Y  | Y  | Y  | Y  | Y   | Y   | 82        |
|                               | Dahlgren et al. (2014a)            | Y  | Y  | Y  | N  | N  | Y  | U  | N  | U  | N   | Y   | 45        |
|                               | Dahlgren et al. (2014b)            | N  | N  | Y  | Y  | N  | Y  | Y  | N  | U  | N   | Y   | 45        |
| Nutrition therapy             | Pettersson et al. (2016)           | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | Y   | 45        |
|                               | Rocks et al. (2014)                | N  | N  | Y  | N  | N  | Y  | U  | Y  | U  | N   | Y   | 36        |
|                               | Garber et al. (2013)               | Y  | Y  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 55        |
| Refeeding treatment           | Madden et al. (2015)               | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | Y   | 45        |
|                               | Peterson et al. (2016)             | Y  | Y  | Y  | Y  | N  | Y  | Y  | N  | U  | N   | Y   | 64        |
| Exercise therapy              | Noetal et al. (2016)               | Y  | Y  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 55        |
| Positive psychology           | Harrison et al. (2016)             | N  | N  | Y  | Y  | N  | Y  | Y  | Y  | N  | N   | U   | 45        |
| Caregiver perspective         | Matthews et al. (2018)             | N  | N  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 36        |
|                               | Gisladottir & Svavarsdottir (2017) | N  | N  | Y  | N  | N  | Y  | Y  | Y  | U  | N   | Y   | 45        |
|                               | Lafrance & Kosmerly (2015)         | N  | N  | Y  | N  | N  | Y  | U  | N  | N  | N   | Y   | 27        |
|                               | Rothschild-Yakar & Stein (2013)    | Y  | Y  | Y  | N  | N  | Y  | Y  | N  | N  | N   | Y   | 55        |

|                      |  |    |    |    |    |   |    |    |    |   |    |    |    |
|----------------------|--|----|----|----|----|---|----|----|----|---|----|----|----|
| Patient perspective  | Fenning et al. (2017)                  | N  | N  | Y  | N  | N | Y  | Y  | U  | N | N  | Y  | 27 |
|                      | Malmendier-Muehlschlegel et al. (2016) | N  | N  | Y  | Y  | N | Y  | Y  | N  | N | N  | Y  | 45 |
|                      | Hillen et al. (2015)                   | N  | N  | Y  | N  | N | Y  | Y  | N  | N | N  | Y  | 36 |
| Therapeutic alliance | Bourion-Bedes et al. (2013)            | Y  | Y  | Y  | N  | N | Y  | Y  | Y  | U | Y  | Y  | 73 |
|                      | Zugai et al. (2018)                    | Y  | Y  | U  | N  | N | Y  | Y  | N  | N | N  | Y  | 45 |
| Total (%)            |  | 38 | 38 | 97 | 17 | 3 | 27 | 90 | 45 | 3 | 21 | 93 |    |

Y, yes; N, no; U, unclear.

Q1: Were the two groups similar and recruited from the same population? Q2: Were the exposures measured similarly to assign people to both exposed and unexposed groups? Q3: Was the exposure measured in a valid and reliable way? Q4: Were confounding factors identified? Q5: Were strategies to deal with confounding factors stated? Q6: Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)? Q7: Were the outcomes measured in a valid and reliable way? Q8: Were the outcomes measured in a valid and reliable way? Q9: Was follow up complete, and if not, were the reasons to loss to follow up described and explored? Q10: Were strategies to address incomplete follow up utilized? Q11: Was appropriate statistical analysis used?

Table 1.3. *Assessment of methodological quality of case control studies*

| Theme         | Citation                | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Total (%) |
|---------------|-------------------------|----|----|----|----|----|----|----|----|----|-----|-----------|
| Group therapy | Depestele et al. (2017) | Y  | Y  | Y  | U  | Y  | N  | N  | U  | Y  | Y   | 80        |

Y, yes; N, no; U, unclear.

Q1: Were the groups comparable other than the presence of disease in cases or the absence of disease in controls? Q2: Were cases and controls matched appropriately? Q3: Were the same criteria used for identification of cases and controls? Q4: Was exposure measured in a standard, valid and reliable way? Q5: Was exposure measured in the same way for cases and controls? Q6: Were confounding factors identified? Q7: Were strategies to deal with confounding factors stated? Q8: Were outcomes assessed in a standard, valid and reliable way for cases and controls? Q9: Was the exposure period of interest long enough to be meaningful? Q10: Was appropriate statistical analysis used?

Table 1.4. *Assessment of methodological quality of qualitative studies*

| Theme                  | Citation                | Q1 | Q2  | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Total (%) |
|------------------------|-------------------------|----|-----|----|----|----|----|----|----|----|-----|-----------|
| Inpatient treatment    | Zugai et al. (2013)     | N  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 80        |
|                        | Harken et al. (2017)    | N  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 80        |
|                        | Basker et al. (2013)    | N  | Y   | N  | N  | N  | N  | N  | N  | N  | Y   | 20        |
|                        | Beukers et al. (2015)   | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
|                        | Bravender et al. (2017) | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
| Family-based treatment | Couturier et al. (2013) | Y  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 90        |
| Refeeding treatment    | Kezelman et al. (2016)  | N  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 80        |
| Qigong therapy         | Guegan et al. (2017)    | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
| Caregiver perspective  | Goodier et al. (2014)   | N  | Y   | Y  | Y  | Y  | N  | Y  | Y  | Y  | Y   | 80        |
|                        | Raveneau et al. (2014)  | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
| Therapeutic alliance   | Zugai et al. (2018)     | N  | Y   | Y  | Y  | Y  | N  | N  | Y  | Y  | Y   | 70        |
| Total (%)              |                         | 9  | 100 | 91 | 91 | 91 | 0  | 45 | 91 | 91 | 100 |           |

Y, yes; N, no; U, unclear.

Q1: Is there congruity between the stated philosophical perspective and the research methodology? Q2: Is there congruity between the research methodology and the research question or objectives? Q3: Is there congruity between the research methodology and the methods used to collect data? Q4: Is there congruity between the research methodology and the representation and analysis of data? Q5: Is there congruity between the research methodology and the interpretation of results? Q6: Is there a statement locating the researcher culturally or theoretically? Q7: Is the influence of the researcher on the research, and vice- versa, addressed? Q8: Are participants, and their voices, adequately represented? Q9: Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body? Q10: Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

## APPENDIX B: INCLUSION AND EXCLUSION CRITERIA

Table 1.5. *Inclusion and exclusion criteria of pilot search*

| Inclusion criteria   | Exclusion criteria  |
|--|---|
| <ul style="list-style-type: none"><li>• Adolescents aged 9 to 21 years</li></ul>   | <ul style="list-style-type: none"><li>• Children younger than 8 years</li><li>• Young adults older than 22 years</li></ul>          |
| <ul style="list-style-type: none"><li>• Admitted to inpatient setting/hospital unit</li></ul>  | <ul style="list-style-type: none"><li>• Admitted on an outpatient setting/day hospital</li><li>• Community based programs</li></ul> |
| <ul style="list-style-type: none"><li>• Diagnosis of anorexia nervosa, bulimia nervosa, binge eating disorder, eating disorder not otherwise specified</li></ul> |   |



Table 1.6. *Inclusion and exclusion criteria of systematic search*

| Inclusion criteria   | Exclusion criteria   |
|--|--|
| <ul style="list-style-type: none"> <li>• Adolescents aged 9 to 21 years of age.</li> <li>• Caregivers as informal supports for adolescents aged 9 to 21 years.</li> <li>• Keywords and synonyms for “adolescents”, including “young adults”, “young women”, “youth”, “adolescence”, “juvenile” and “teenager” will be included.</li> <li>• When the abstract does not specifically identify one of the above-mentioned terms nor the specified age range, then a full text will be retrieved to identify the age of participants.</li> </ul> | <ul style="list-style-type: none"> <li>• No age range specified in studies.</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Studies that discussed taking place on an inpatient unit for even a portion of treatment and/or interventions.</li> </ul>   | <ul style="list-style-type: none"> <li>• Studies that discussed taking place in a day treatment setting or a community setting.</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Diagnosis of anorexia nervosa, bulimia nervosa, binge eating disorder, and eating disorder not otherwise specified as per DSM-V and DSM-IV, DSM-IV TR, ICD-9, and ICD-10 was made to ensure sufficient evidence and the inclusion of <u>international research</u>.</li> </ul>  | <ul style="list-style-type: none"> <li>• Diagnosis of anorexia nervosa, bulimia nervosa, binge eating disorder, and eating disorder not otherwise specified in diagnostic taxonomies earlier than DSM-IV and ICD-9.</li> </ul> |
| <ul style="list-style-type: none"> <li>• Only include studies discussing eating disorder interventions and/or practices</li> </ul>   | <ul style="list-style-type: none"> <li>• Studies discussing other factors such as hormonal effects and biophysical effects will be excluded.</li> </ul>  |

## APPENDIX C: SEARCH STRATEGIES

Table 1.7. *MEDLINE Search Terms (from OVID Interface)*

| Number | Search Terms  | Results |
|--------|---|---------|
| 1      | adolescen*.mp.  | 1878987 |
| 2      | exp Adolescent/   | 1821410 |
| 3      | teen*.mp.   | 26545   |
| 4      | minors.mp.  | 5252    |
| 5      | exp Minors/   | 2450    |
| 6      | young adult*.mp.  | 640566  |
| 7      | exp Young Adult/  | 583264  |
| 8      | youth*.mp.  | 62955   |
| 9      | 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8  | 2200838 |
| 10     | eating disorder*.mp.  | 23191   |
| 11     | anorexia.mp.  | 31022   |
| 12     | exp Anorexia Nervosa/   | 12034   |
| 13     | exp Anorexia/   | 4640    |
| 14     | bulimia.mp.   | 9672    |
| 15     | exp Bulimia Nervosa/  | 2007    |
| 16     | exp Bulimia/  | 5260    |
| 17     | binge eating disorder*.mp.  | 2401    |
| 18     | exp Binge-Eating Disorder/  | 942     |
| 19     | "eating disorder not otherwise specified".mp.   | 398     |
| 20     | ednos.mp.   | 348     |
| 21     | 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20                          | 49685   |
| 22     | inpatient*.mp.  | 92694   |
| 23     | exp Inpatients/   | 16891   |
| 24     | in-patient*.mp.   | 1420614 |
| 25     | psychiatric patient*.mp.  | 12894   |
| 26     | mental patient*.mp.   | 2384    |
| 27     | mental health patient*.mp.  | 550     |
| 28     | special* treatment.mp.  | 2270    |
| 29     | hospitali*.mp.  | 253853  |
| 30     | exp Hospitalization/  | 195921  |
| 31     | (hospital adj2 setting*).mp.  | 21363   |
| 32     | (hospital adj2 program*).mp.  | 3012    |
| 33     | 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32                          | 1785646 |
| 34     | 9 and 21 and 33   | 2981    |
| 35     | limit 34 to (addresses or autobiography or bibliography or biography or case reports or | 255     |

|    |   |      |
|----|---|------|
|    | classical article or clinical conference or congresses or consensus development conference or consensus development conference, nih or dataset or dictionary or directory or editorial or festschrift or interactive tutorial or lectures or legal cases or legislation or letter or news or newspaper article or overall or patient education handout or periodical index or portraits or video-audio media or webcasts) |      |
| 36 | limit 34 to english language  | 2550 |
| 37 | 36 not 35   | 2359 |

Table 1.8. *PsycINFO Search Terms (from OVID Interface)*

| Number | Search Terms   | Results |
|--------|--|---------|
| 1      | adolescen*.mp.   | 232969  |
| 2      | teen*.mp.  | 20366   |
| 3      | minors*.mp.  | 1994    |
| 4      | young adult*.mp.   | 40365   |
| 5      | youth*.mp.   | 85950   |
| 6      | 1 or 2 or 3 or 4 or 5  | 311735  |
| 7      | eating disorder*.mp.   | 25276   |
| 8      | exp Eating Disorders/  | 26840   |
| 9      | anorexia.mp.   | 14761   |
| 10     | exp ANOREXIA NERVOSA/  | 10063   |
| 11     | bulimia.mp.  | 10518   |
| 12     | exp BULIMIA/   | 7195    |
| 13     | binge eating disorder*.mp.   | 2597    |
| 14     | exp Binge Eating Disorder/   | 1409    |
| 15     | exp Binge Eating/  | 2499    |
| 16     | "eating disorder not otherwise specified".mp.  | 490     |
| 17     | ednos.mp.  | 383     |
| 18     | 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17  | 36363   |
| 19     | inpatient*.mp.   | 44542   |
| 20     | exp Hospitalized Patients/   | 11705   |
| 21     | in-patient*.mp.  | 96178   |
| 22     | psychiatric patient*.mp.   | 36537   |
| 23     | exp Psychiatric Patients/  | 27932   |
| 24     | exp Psychiatric Hospitals/   | 7434    |
| 25     | mental patient*.mp.  | 3145    |
| 26     | mental health patient*.mp.   | 591     |
| 27     | special* treatment.mp.   | 1291    |
| 28     | hospitali*.mp.   | 56304   |
| 29     | hospital*.mp.  | 154128  |
| 30     | exp HOSPITAL PROGRAMS/   | 6548    |
| 31     | exp PSYCHIATRIC HOSPITAL PROGRAMS/   | 4514    |
| 32     | hospitalization.mp.  | 27465   |
| 33     | exp HOSPITALIZATION/   | 20364   |
| 34     | exp PSYCHIATRIC HOSPITALIZATION/   | 9596    |
| 35     | (hospital adj2 setting*).mp.   | 3997    |
| 36     | (hospital adj2 program*).mp.   | 4847    |
| 37     | 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or<br>30 or 31 or 32 or 33 or 34 or<br>35 or 36 | 282355  |

|    |  |      |
|----|--|------|
| 38 | 6 and 18 and 37  | 1156 |
| 39 | limit 38 to ("0200 book" or "0240 authored book" or "0280 edited book" or "0300 encyclopedia" or "0400 dissertation abstract" or "0500 electronic collection") | 291  |
| 40 | limit 38 to english language   | 958  |
| 41 | 40 not 39  | 667  |

Table 1.9. *Embase Search Terms (from OVID Interface)*

| Number | Search Terms   | Results |
|--------|--|---------|
| 1      | adolescen*.mp.   | 1491454 |
| 2      | exp adolescence/   | 91108   |
| 3      | teen*.mp.  | 34128   |
| 4      | minors.mp.   | 3844    |
| 5      | exp "minor (person)"/  | 466     |
| 6      | young adult*.mp.   | 244334  |
| 7      | exp young adult/   | 173597  |
| 8      | youth*.mp.   | 66a855  |
| 9      | exp juvenile/  | 3323894 |
| 10     | 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9                      | 3525900 |
| 11     | eating disorder*.mp.   | 31183   |
| 12     | exp eating disorder/   | 45293   |
| 13     | anorexia.mp.   | 78032   |
| 14     | exp anorexia nervosa/  | 18897   |
| 15     | exp anorexia/  | 53959   |
| 16     | bulimia.mp.  | 14245   |
| 17     | exp bulimia/   | 13236   |
| 18     | binge eating disorder*.mp.                                     | 6039    |
| 19     | exp binge eating disorder/                                     | 5726    |
| 20     | "eating disorder not otherwise specified".mp.                  | 552     |
| 21     | ednos.mp.  | 483     |
| 22     | 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 | 104190  |
| 23     | inpatient*.mp.   | 129687  |
| 24     | exp hospital patient/  | 289746  |
| 25     | exp hospitalization/   | 317947  |
| 26     | in-patient*.mp.  | 2056891 |
| 27     | psychiatric patient*.mp.                                       | 16028   |
| 28     | mental patient*.mp.  | 27231   |
| 29     | exp mental patient/  | 27231   |
| 30     | exp mental hospital/   | 34716   |
| 31     | mental health patient*.mp.                                     | 654     |
| 32     | special* treatment.mp.   | 3156    |
| 33     | hospitali*.mp.   | 473119  |
| 34     | hospital*.mp.  | 2209983 |
| 35     | exp hospital/  | 1293772 |
| 36     | exp pediatric hospital/  | 27405   |
| 37     | hospitalization.mp.  | 361989  |
| 38     | (hospital adj2 setting*).mp.                                   | 28206   |
| 39     | (hospital adj2 program*).mp.                                   | 3886    |

|    |   |         |
|----|---|---------|
| 40 | 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39  | 4041977 |
| 41 | 10 and 22 and 40  | 5982    |
| 42 | limit 41 to (book or book series or chapter or conference abstract or conference paper or conference proceeding or "conference review" or editorial or erratum or letter or note or short survey) | 986     |
| 43 | limit 41 to english language  | 5220    |
| 44 | 43 not 42   | 4272    |

Table 2.0. *CINAHL Search Terms (from EBSCO Interface)*

| Number | Query   | Limiters/Expanders  | Results   |
|--------|---|---|-----------|
| S43    | S42   | Limiters - Scholarly<br>(Peer Reviewed)<br>Journals; Language:<br>English<br>Search modes - Find<br>all my search terms | 1,805     |
| S42    | S9 AND S22 AND S41  | Search modes - Find<br>all my search terms  | 1,889     |
| S41    | S23 OR S24 OR S25 OR S26 OR S27<br>OR S28 OR S29 OR S30 OR S31 OR<br>S32 OR S33 OR S34 OR S35 OR S36<br>OR S37 OR S38 OR S39 OR S40 | Search modes - Find<br>all my search terms  | 1,322,967 |
| S40    | hospital N2 program*  | Search modes - Find<br>all my search terms  | 7,351     |
| S39    | hospital N2 setting*  | Search modes - Find<br>all my search terms  | 9,661     |
| S38    | "hospital program"  | Search modes - Find<br>all my search terms  | 5,115     |
| S37    | (MM "Hospitals, Psychiatric")   | Search modes - Find<br>all my search terms  | 2,948     |
| S36    | (MM "Hospitals, Pediatric")   | Search modes - Find<br>all my search terms  | 1,649     |
| S35    | (MM "Hospital Programs")  | Search modes - Find<br>all my search terms  | 3,035     |
| S34    | "hospital setting"  | Search modes - Find<br>all my search terms  | 5,135     |
| S33    | (MM "Adolescent, Hospitalized")   | Search modes - Find<br>all my search terms  | 198       |
| S32    | "hospitali*"  | Search modes - Find<br>all my search terms  | 65,697    |
| S31    | "special* treatment"  | Search modes - Find<br>all my search terms  | 492       |
| S30    | "mental health patient*"  | Search modes - Find<br>all my search terms  | 385       |
| S29    | "mental patient"  | Search modes - Find<br>all my search terms  | 240       |
| S28    | (MH "Psychiatric Units")  | Search modes - Find<br>all my search terms  | 2,025     |
| S27    | (MH "Psychiatric Patients")   | Search modes - Find<br>all my search terms  | 8,892     |



|     |  |   |           |
|-----|--|---|-----------|
| S26 | "psychiatric patient*"   | Search modes - Find all my search terms | 10,445    |
| S25 | "in-patient*"  | Search modes - Find all my search terms | 1,269,337 |
| S24 | (MM "Inpatients")  | Search modes - Find all my search terms | 4,339     |
| S23 | "inpatient*"   | Search modes - Find all my search terms | 86,808    |
| S22 | S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 | Search modes - Find all my search terms | 16,089    |
| S21 | "ednos"  | Search modes - Find all my search terms | 165       |
| S20 | "eating disorder not otherwise specified"  | Search modes - Find all my search terms | 185       |
| S19 | (MM "Binge Eating Disorder")   | Search modes - Find all my search terms | 29        |
| S18 | "binge eating disorder*"   | Search modes - Find all my search terms | 827       |
| S17 | (MM "Bulimia")   | Search modes - Find all my search terms | 1,570     |
| S16 | (MM "Bulimia Nervosa")   | Search modes - Find all my search terms | 645       |
| S15 | "bulimia"  | Search modes - Find all my search terms | 3,886     |
| S14 | (MM "Anorexia")  | Search modes - Find all my search terms | 586       |
| S13 | (MM "Anorexia Nervosa")  | Search modes - Find all my search terms | 2,623     |
| S12 | "anorexia"   | Search modes - Find all my search terms | 6,697     |
| S11 | (MM "Eating Disorders+")   | Search modes - Find all my search terms | 10,416    |
| S10 | "eating disorder*"   | Search modes - Find all my search terms | 10,273    |
| S9  | S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8                                     | Search modes - Find all my search terms | 473,744   |
| S8  | (MM "Adolescence+")  | Search modes - Find all my search terms | 1,857     |
| S7  | "youth*"   | Search modes - Find all my search terms | 28,176    |
| S6  | (MM "Young Adult")   | Search modes - Find all my search terms | 408       |

|    |                       |   |         |
|----|-----------------------|---|---------|
| S5 | "young adult*"        | Search modes - Find all my search terms | 156,475 |
| S4 | (MM "Minors (Legal)") | Search modes - Find all my search terms | 291     |
| S3 | "minors"              | Search modes - Find all my search terms | 1,195   |
| S2 | "teen*"               | Search modes - Find all my search terms | 12,512  |
| S1 | "adolescen*"          | Search modes - Find all my search terms | 394,048 |

Table 2.1. *ERIC Search Terms (from EBSCO Interface)*

| Number | Query   | Limiters/Expanders  | Results |
|--------|---|---|---------|
| S27    | S26   | Limiters - Scholarly<br>(Peer Reviewed)<br>Journals; Language:<br>English<br>Search modes - Find<br>all my search terms | 14      |
| S26    | S6 AND S13 AND S25  | Search modes - Find<br>all my search terms  | 26      |
| S25    | S14 OR S15 OR S16 OR S17 OR S18 OR<br>S19 OR S20 OR S21 OR S22 OR S23 OR<br>S24 | Search modes - Find<br>all my search terms  | 11,318  |
| S24    | hospital N2 program*  | Search modes - Find<br>all my search terms  | 385     |
| S23    | hospital N2 setting*  | Search modes - Find<br>all my search terms  | 271     |
| S22    | "hospital program"  | Search modes - Find<br>all my search terms  | 53      |
| S21    | "hospital setting"  | Search modes - Find<br>all my search terms  | 189     |
| S20    | "hospitali"   | Search modes - Find<br>all my search terms  | 2,668   |
| S19    | special* treatment  | Search modes - Find<br>all my search terms  | 175     |
| S18    | "mental health patient"   | Search modes - Find<br>all my search terms  | 14      |
| S17    | "mental patient"  | Search modes - Find<br>all my search terms  | 132     |
| S16    | "psychiatric patient"   | Search modes - Find<br>all my search terms  | 374     |
| S15    | "in-patient"  | Search modes - Find<br>all my search terms  | 7,289   |
| S14    | "inpatient"   | Search modes - Find<br>all my search terms  | 809     |
| S13    | S7 OR S8 OR S9 OR S10 OR S11 OR<br>S12  | Search modes - Find<br>all my search terms  | 1,689   |
| S12    | "ednos"   | Search modes - Find<br>all my search terms  | 6       |
| S11    | "eating disorder not otherwise specified"                                       | Search modes - Find<br>all my search terms  | 16      |

|     |                            |   |         |
|-----|----------------------------|---|---------|
| S10 | “binge eating disorder*”   | Search modes - Find all my search terms | 45      |
| S9  | “bulimia”                  | Search modes - Find all my search terms | 428     |
| S8  | “anorexia”                 | Search modes - Find all my search terms | 386     |
| S7  | “eating disorder*”         | Search modes - Find all my search terms | 1,487   |
| S6  | S1 OR S2 OR S3 OR S4 OR S5 | Search modes - Find all my search terms | 124,878 |
| S5  | “youth*”                   | Search modes - Find all my search terms | 65,445  |
| S4  | “young adult*”             | Search modes - Find all my search terms | 14, 486 |
| S3  | “minors”                   | Search modes - Find all my search terms | 720     |
| S2  | “teen*”                    | Search modes - Find all my search terms | 2,877   |
| S1  | “adolescen*”               | Search modes - Find all my search terms | 69,228  |