A RANDOMIZED CONTROLLED TRIAL OF A THERAPIST-ASSISTED
INTERNET COGNITIVE BEHAVIOUR THERAPY PROGRAM FOR WOMEN WITH
POSTPARTUM DEPRESSION

A Thesis
Submitted to the Faculty of Graduate Studies and Research
In Partial Fulfillment of the Requirements
for the Degree of
Doctor of Philosophy
in Clinical Psychology
University of Regina

By
Nicole Elizabeth Pugh
Regina, Saskatchewan
January 24th, 2014

Copyright 2013: N.E. Pugh
UNIVERSITY OF REGINA

FACULTY OF GRADUATE STUDIES AND RESEARCH

SUPERVISORY AND EXAMINING COMMITTEE

Nicole Elizabeth Pugh, candidate for the degree of Doctor of Philosophy in Clinical Psychology, has presented a thesis titled, *A Randomized Controlled Trial of a Therapist-Assisted Internet Cognitive Behaviour Therapy Program for Women with Postpartum Depression*, in an oral examination held on January 24, 2014. The following committee members have found the thesis acceptable in form and content, and that the candidate demonstrated satisfactory knowledge of the subject material.

External Examiner: *Dr. Patrick McGrath, IWK Health Centre*

Supervisor: Dr. Heather Hadjistavropoulos, Department of Psychology

Committee Member: Dr. Nuelle Novik, Faculty of Social Work

Committee Member: *Dr. Kristi Wright, Department of Psychology*

Committee Member: Dr. Pamela Clarke, Professional Associate

Chair of Defense: Dr. Ken Leyton Brown, Department of History

*via teleconference*
ABSTRACT

Postpartum depression (PPD) impacts up to 15% of Canadian women following childbirth. The debilitating disorder not only impacts the woman, but also is related to short- and long-term consequences of her infant’s development. A systematic review of psychological treatments for PPD demonstrated symptomatic improvements from pre- to post-treatment and superiority to control conditions (Sockol, Epperson, & Barber, 2011). Remarkably, many women suffering from PPD do not receive appropriate treatment. Internet and computer-based delivery formats are an innovative way to improve access to psychological treatment. While therapist-assisted Internet cognitive behaviour therapy (TAICBT) has proven more efficacious than a controlled waitlist condition to treat depressive symptoms reported by mothers of young children (Sheeber et al., 2012), research has not investigated TAICBT for PPD.

The current study examined the efficacy of TAICBT for the treatment of PPD reported by Saskatchewan women who have a child less than one year of age. Using a randomized control design, women (N = 50) scoring above 10 on the Edinburgh Postnatal Depression Scale (EPDS) were randomly assigned to receive either TAICBT or waitlist control (WLC). The efficacy of the treatment was investigated at baseline and at seven- to 10-week follow-up. Treatment satisfaction, therapeutic alliance, and open-ended questions regarding participant experiences with the program were explored at post-treatment. For a longer-term follow-up, TAICBT participants were contacted four-weeks following treatment completion. Analyses included multi-level mixed models, clinical significance testing, multiple regressions, and thematic content analysis of the open-ended responses. Results indicated that symptoms of PPD tended to decrease more
quickly over time for participants in the TAICBT group compared to those in the WLC group, and these results were clinically significant, reliable, and maintained at four-week follow-up. Secondary analyses indicated that TAICBT participants demonstrated a greater reduction in symptoms of postnatal anxiety, general stress, and parental distress and an increase in psychological and environmental quality of life when compared to the WLC participants. Study implications, limitations, and future research directions are discussed.
ACKNOWLEDGEMENT

The process and completion of this dissertation was a challenging and rewarding experience. It was a process of significant personal growth and development and would not have been possible without the support, guidance, and assistance from a number of individuals. It is to them that I owe my sincerest gratitude.

The wisdom, knowledge, and research commitment offered my supervisor, Dr. Heather Hadjistavropoulos, was always a source of inspiration and motivation. She was unwavering with patience, support, and encouragement. I will be forever grateful for her assistance, mentorship, and very much appreciated friendship throughout grad school.

I would also like to thank my distinguished committee members: Dr. Kristi Wright, Dr. Nuelle Novik, and Dr. Pamela Clarke, for their input throughout the initial stages to the completion of this dissertation. Their time, effort, and critical, yet supportive, feedback were very much appreciated. In addition, I would like to thank Dr. Hugh McCague. His instruction and expertise regarding statistical modelling provided invaluable guidance for the complex data analysis.

My sincerest thanks to Dr. Angela Bowen, Mrs. Elita Patterson, and the Government of Saskatchewan’s Maternal Mental Health Strategy Team. From the early stages of this research, I felt their total interest and support. The recruitment of participants would have been much more challenging without their assistance.

I would also like to acknowledge funding through the Faculty of Graduate Studies, the BMO Financial Group Fellowship for Rural and Northern Studies, and the Canadian Institutes of Health Research Regional Partnership Program. Such generosity to fund this dissertation project was greatly appreciated and will not be forgotten.
Last, but certainly not least, I would like to express my appreciation for my lab colleagues and our coordinator, Mrs. Marcie Nugent. Thanks for your ongoing interest, your stimulating discussions, and sharing your coffee breaks during graduate school.
DEDICATION

I would like to dedicate this dissertation to my family, the “Core Four”, and to my great aunts. To my father, Dr. George Pugh, who sat beside me countless nights during my undergraduate degree and taught me academic writing skills, critical thinking, and patience and persistence during my academic journey. To my mother, Mrs. Christine Pugh. Thank you for always providing me with unconditional love and support throughout this process. You are the world’s best mother. To my sister, Ms. Renee Pugh. Although we reside in different countries, your encouragement, love, and support is always a quick phone call, Skype date, or text message away. I could not have pursued this academic journey without my family’s belief in my abilities and support to pursue higher education. I am forever grateful for the “Core Four”.

I would also like to dedicate this dissertation to my beloved great aunts, Ms. Elsie Shipka and Ms. Louise Lang. Your continued love, interest in my academic pursuit, and support during this journey will be forever treasured.
# TABLE OF CONTENTS

ABSTRACT ................................................................................................................................. i

ACKNOWLEDGEMENT ........................................................................................................... iii

DEDICATION .............................................................................................................................. v

LIST OF TABLES ....................................................................................................................... x

LIST OF FIGURES ..................................................................................................................... xi

LIST OF APPENDICES .............................................................................................................. xii

CHAPTER ONE: INTRODUCTION ............................................................................................ 1

CHAPTER TWO: LITERATURE REVIEW ................................................................................. 3

Postpartum Disorders ............................................................................................................... 3

Postpartum blues ....................................................................................................................... 3

Postpartum psychosis ................................................................................................................ 5

Postpartum depression (PPD) ................................................................................................... 6

The Impact of PPD .................................................................................................................... 14

Mother interaction style ........................................................................................................... 14

Care-giving practices ............................................................................................................... 15

PPD and child cognitive growth and development ................................................................. 16

PPD and child emotional and behavioural development ........................................................ 17

PPD Treatment ........................................................................................................................ 19

Individual CBT ....................................................................................................................... 21

Group CBT .............................................................................................................................. 27
Research limitations of CBT for PPD ................................................................. 29
Under treatment of PPD ....................................................................................... 30
Utilizing the Internet for Therapy ........................................................................ 31
Benefits of Internet therapy ................................................................................. 32
Disadvantages of Internet therapy ....................................................................... 34
Internet CBT: .......................................................................................................... 36
Efficacy of ICBT for major depression ................................................................. 38
Therapist-assisted ICBT ....................................................................................... 40
Internet therapy and therapeutic alliance .......................................................... 41
Efficacy of Internet therapy for mothers ............................................................. 43
Chapter Summary ............................................................................................... 46

CHAPTER THREE: PURPOSE AND OBJECTIVES OF PRESENT STUDY .......... 47

CHAPTER FOUR: Method ...................................................................................... 50
Participants .......................................................................................................... 50
Measures .............................................................................................................. 51
Primary assessment measure .............................................................................. 52
Secondary assessment measures ....................................................................... 58
Treatment relevant outcome measures ............................................................ 62
Open-ended questions ....................................................................................... 64
Participants and Procedure ................................................................................ 65
Screening interviews ......................................................................................... 65
Full-screen interview ......................................................................................... 66
Randomized assignment .................................................................67
Waitlist control condition ..............................................................67
TAICBT Intervention ......................................................................68
Depression online .........................................................................68
Adaptation of depression online ....................................................69
TAICBT Treatment Setup ..............................................................71
Analyses .........................................................................................72
   Longitudinal mixed-effects model ...............................................72
   Analysis of treatment variables ..................................................75
   Qualitative data analysis ............................................................76
Preparation of the Data for Analysis ..............................................77

CHAPTER FIVE: RESULTS ................................................................79
Preliminary Analyses ......................................................................79
Treatment Received Reported by WLC Group ...............................82
Program Engagement and Attrition ..............................................82
Testing Hypothesis 1 ......................................................................85
   Mixed-model analysis for the EPDS measure ...............................85
   Mixed-model analysis for EPDS subscales ..................................88
   Multiple regression analyses of secondary outcome measures ....88
   Multiple regression analyses with accounted missing data ..........92
Testing Hypothesis 2 ......................................................................97
Testing Hypothesis 3 ......................................................................98
Testing Hypotheses 4 and 5 ..........................................................98
LIST OF TABLES

Table 1  Demographic Characteristics by Group.......................................................... 54
Table 2  Comparisons of Background Characteristics between Groups..................... 55
Table 3  Scales Administered at Each Assessment Phase ............................................. 56
Table 4  Means and Standard Deviations for Primary and Secondary Outcome
        Measures........................................................................................................... 80
Table 5  Correlations among Measures at Pre-Treatment ............................................. 81
Table 6  Treatment Received by the Waitlist Control Group during Wait Period (n
        = 19) ................................................................................................................... 82
Table 7  Program Utilization by TAICBT Participants (N = 24) ................................. 84
Table 8  Multilevel Models for Week and Treatment on EPDS Total and Subscale
        Scores .................................................................................................................. 86
Table 9  Regression Analyses of Secondary Outcome Variables............................... 94
Table 10 Means and Standard Deviations for Treatment Satisfaction and
          Therapeutic Alliance Reported by the TAICBT Participants (n = 20) ............. 101
Table 11 Multilevel Model for Treatment Satisfaction and Therapeutic Alliance
          on EPDS Total Score.......................................................................................... 102
LIST OF FIGURES

Figure 1. Flow of process for research participants......................................................... 53

Figure 2. Proportion of participants in each treatment condition who demonstrated
different classifications of clinically significant change, according to
Jacobson and Truax’s (1991) definition, on the EPDS. (TAICBT =
Therapist Assisted Internet Cognitive Behaviour Therapy; WLC =
Waitlist Control Group). Original in Colour................................................................. 96

Figure 3. Qualitative analysis summary............................................................................. 103
LIST OF APPENDICES

APPENDIX A. ADVERTISEMENT .................................................................173

APPENDIX B. EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS) ..........174

APPENDIX C. DEPRESSION ANXIETY STRESS SCALE (DASS-21) ..............176

APPENDIX D. PARENTAL STRESS INDEX-SHORT FORM (PSI-SF) ..............178

APPENDIX E. WORLD HEALTH ORGANIZATION QUALITY OF LIFE
   ASSESSMENT BREF (WHOQOL-BREF) ..................................................179

APPENDIX F. THE THERAPEUTIC ALLIANCE QUESTIONNAIRE (TAQ) .........183

APPENDIX G. THE TREATMENT SATISFACTION QUESTIONNAIRE (TSQ) ..185

APPENDIX H. CREDIBILITY/EXPECTANCY QUESTIONNAIRE (CEQ) ..........189

APPENDIX I. FOLLOW-UP INTERVIEW ................................................................191

APPENDIX J. ETHICS APPROVAL DOCUMENTATION ..................................192

APPENDIX K. THE MINI-INTERNATIONAL NEUROPSYCHIATRIC
   INTERVIEW (MINI) ..................................................................................195

APPENDIX L. DEMOGRAPHIC QUESTIONS ....................................................196

APPENDIX M. MOTHERFIRST AND CONTROL CONDITION PAMPHLET .....200

APPENDIX N. INFORMATION PAGE AND CONSENT FORM FOR WAITLIST
   CONTROL PARTICIPANTS .........................................................................201

APPENDIX O. TREATMENT QUESTIONS ADMINISTERED TO THE
   WAITLIST GROUP ....................................................................................206
APPENDIX P. COMPARISON OF DEPRESSION ONLINE TO MATERNAL DEPRESSION ONLINE ...............................................................207

APPENDIX Q: PHYSICIAN NOTIFICATION FORM.........................................................213

APPENDIX R. LATTICE PLOTS OF INDIVIDUALS’ EPDS TOTAL OVER TIME (WEEKS) .........................................................................................................................214

APPENDIX S. MULTILEVEL MODEL INCLUDING SEVERE CASE ......................215
CHATER ONE: INTRODUCTION

Postpartum depression (PPD) is a frequently occurring clinical mood disorder that affects approximately 8 to 15% of Canadian women (Chalmers, Dzakpasu, Heaman, & Kaczorowski, 2008). PPD is a debilitating illness for a woman, impacting her day-to-day functioning, her ability to care for her infant, the mother-infant bond, and her overall quality of life (Kendall-Tackett, 2010; Martins & Gaffan, 2000). Unfortunately, not only does this disorder affect the mother, but it also may result in significant short- and long-term consequences for the infant (Tronick & Reck, 2009). While pharmacotherapy has demonstrated efficacy in the treatment of PPD (Bledsoe & Grote, 2006), a substantial portion of women reject this treatment modality (Dennis & Chung-Lee, 2006; Goodman, 2009). Research has demonstrated that psychotherapy is an effective alternative to pharmacotherapy for the treatment of PPD. More specifically, cognitive-behaviour therapy (CBT) is among the empirically supported psychotherapy orientations to treat PPD (Cuijpers, Brannmark, & van Straten, 2008). In fact, CBT is found to be not only an efficacious treatment for PPD (Chabrol et al., 2002; Honey, Bennett, & Morgan, 2002; Rojas et al., 2007), but also a helpful preventative measure to avoid the occurrence of this disorder altogether (Appleby et al., 2003).

While there is growing evidence in support of psychotherapy for PPD (Cuijpers et al., 2008; Dimidjian & Goodman, 2009), treatment rates among pregnant and postpartum women with psychiatric disorders are very low (Vesga-Lopez, Blanco, Keyes, Olfson, & Grant, 2008). Researchers have explored treatment barriers for PPD and identified that stigma associated with receiving mental health treatment, difficulty arranging childcare, transportation challenges, and time and financial constraints are factors related to the
under treatment of PPD (Goodman, 2009). One innovative and promising solution to address these treatment barriers is the administration of CBT over the Internet, referred to as Internet CBT (ICBT). There are an increasing number of controlled trials in ICBT in various fields such as mood disorders, anxiety disorders, and health conditions (Andersson, Ljotsson, & Weise, 2011; Cuijpers, Donker, van Straten, & Andersson, 2010). A recent study conducted by Sheeber and colleagues (2012) reported that online CBT offered along with telephone coach assistance was more efficacious for economically disadvantaged mothers than a waitlist control condition. The online program, however, was geared toward mothers of children less than five years of age and was not exclusively targeted to treat depression in the postpartum period. Given hormonal fluctuations and the pronounced sleep deprivation evident in the postpartum period, it is possible that women struggling with PPD may respond differently to online therapy. This investigation explored the efficacy of a therapist-assisted ICBT (TAICBT) program for women in Saskatchewan afflicted with PPD who have children less than one year of age.
CHAPTER TWO: LITERATURE REVIEW

In the literature review that follows, a brief discussion of the three postpartum conditions and disorders will be presented. The focus will then turn to the prevalence of PPD along with risk factors associated with acquiring the condition. A discussion of the consequences of PPD will follow, including how PPD impacts the mother’s interaction style and care-giving practices as well as the child’s growth and development. Efficacy studies of in-person CBT for PPD will then be examined. Lastly, a description of ICBT will be presented followed by evidence to support TAI-CBT for the treatment of major depression and depression reported by mothers of young children.

Postpartum Disorders

The postnatal period is widely recognized as a period of time when women are more vulnerable to developing transient mood conditions and clinical mood disorders (Kendall-Tackett, 2010; Kennerley & Gath, 1989). Indeed, childbirth is a life-altering event for most women, marking a pivotal point in psychological and social development as well as being a significant physiological experience. The conditions and disorders associated with the postnatal period range from mild and transient to debilitating, where hospitalization may be required (Stewart, Robertson, Dennis, Grace, & Wallington, 2003). These conditions include the postnatal blues, postpartum depression, and postpartum psychosis and are unique with respect to prevalence, onset, presentation, duration, impairment of functioning, and treatment considerations.

Postpartum blues. The postpartum blues, also referred to as the baby blues, postnatal blues, or maternity blues, is the least severe and most common mood disturbance following childbirth (Henshaw, 2003). Using two separate validated
measures, O’Hara, Schlechte, Lewis, and Varner (1991) found a prevalence rate of approximately 26% for the postpartum blues. It is a brief condition that typically occurs between the third and tenth day following childbirth and is often conceptualized as a normal adjustment period for mothers (Faisal-Cury, Menezes, Tedesco, Kahalle, & Zugaib, 2008; Halbreich & Karkun, 2006). While a standardized definition of the postpartum blues has not been established, it has been described as a transitory condition that is characterized by weeping/tearfulness, mild depression, mood lability (ranging from despondency to euphoria), fatigue, anxiety, and confusion (Henshaw, 2003; Reck, Stehle, Reinig, & Mundt, 2009). With respect to duration, Hau and Levy (2003) found that in the first seven days postpartum, 62% of women reported experiencing the postpartum blues for one to two days, 25% for three to four days, and 13% for five to six days.

A variety of factors are related to the postpartum blues. Researchers have associated the postpartum blues with changes in glucocorticoid and reproductive hormones following childbirth accompanied by sleep deprivation, physical exhaustion, and recovery from childbirth (Berggren-Clive, 1998; Henshaw, 2003; Hopkins, Campbell, & Marcus, 1987). Women with babies born with congenital or other physical problems are also more prone to develop the postpartum blues (Murata, Nadoka, Morioka, Oiji, & Saito, 1998). Psychological factors related to the postpartum blues include women who report a history of depression (Henshaw, 2003; O’Hara et al., 1991), stressful life events during pregnancy (O’Hara et al., 1991), and inadequate social support in the first week after childbirth: that is, lack of support from family members, friends, and partners (Murata et al., 1998). In terms of marital content, one study found an
association between the postpartum blues and reported discontent with the quality of marital relationship and sympathy from the partner (Ehlert, Patalla, Kirschbaum, Piedmont, & Hellhammer, 1990), while a separate study failed to find such a relationship (O’Hara et al., 1991). Other identified risk factors associated with the postpartum blues include greater sleep disruption in late pregnancy (Wilkie & Shapiro, 1992), night-time labour (Swain, O’Hara, Starr, & Gorman, 1997), and tobacco use (Faisal-Cury et al., 2008).

While the postpartum blues is a temporary condition for the majority of women, which is often overcome through reassurance and support, research has suggested that the postpartum blues can extend into subsequent affective disorders, including PPD. To illustrate, a recent prospective study found that women who reported the postpartum blues were approximately four times more likely to experience PPD, according to the DSM-IV criteria, three months following delivery (Reck et al., 2009). A separate study also found that the postpartum blues was an independent predictor of both minor depression\(^1\) and major depression at six months postpartum (Henshaw, 2003). Henshaw (2003) argued that women with postpartum blues should become the focus of appropriate psychological interventions, providing an opportunity for the prevention of PPD.

**Postpartum psychosis.** Postpartum psychosis is the most severe mood disorder that can occur within the first year after child birth (Stewart et al., 2003). This disorder is characterized by paranoid, grandiose, or bizarre delusions, mood swings, confused thinking, and grossly disorganized behaviour that represents a dramatic change from

\(^1\)The criteria for minor depression requires an individual to have, for at least two weeks, two to four depressive symptoms present for more than half the days, with at least one of these symptoms being depressed mood or anhedonia.
previous functioning (Sit, Rothschild, & Wisner, 2006). In rare cases of postpartum psychosis, infanticide (i.e., purposefully killing a child less than one year of age) and neonaticide (i.e., the killing of a newborn within 24 hours of birth) may occur (Spinelli, 2004). The clinical onset of postpartum psychosis is rapid, with symptoms presenting as early as two to three days following childbirth and the majority of episodes developing within the first two weeks after delivery (Stewart et al., 2003).

In the present edition of the DSM-V (American Psychiatric Association, 2013), postpartum psychosis is not recognized as a discrete entity. Rather, the DSM-V has classified postpartum psychosis as a severe form of an affective disorder with psychotic features that present within four weeks of childbirth.

With regard to prevalence rates, postpartum psychosis is far less common than other postpartum conditions and disorders and occurs in approximately one per 1,000 births (Harlow et al., 2007). However, the prevalence rate of postpartum psychosis for women with even one previous postpartum psychotic episode is approximately 50% (Boyce & Barriball, 2010). Research has also indicated that 20 to 30% of women who experience postpartum psychosis report a history of a mood disorder, particularly bipolar disorder (Kendell, Maguire, Connor, & Cox, 1981). In fact, follow-up studies indicate that approximately 72 to 88% of women who reported postpartum psychosis also met criteria for bipolar disorder or schizoaffective disorder, whereas only 12% met criteria for schizophrenia (Brockington et al., 1981; Robling, Paykel, Dunn, Abbott, & Katona, 2000).

**Postpartum depression (PPD).** PPD is considered the most prevalent serious clinical mood disorder among postpartum women (O’Hara & Swain, 1996). PPD is
distinguished from the postpartum blues and from a regular episode of major depression primarily by the severity and onset of symptoms following childbirth (Clayton, 2004). PPD is defined strictly in the psychiatric nomenclature as a major depressive disorder with the specifier *peripartum onset* if it occurs during pregnancy or within four weeks following childbirth (American Psychiatric Association, 2013). Thus, PPD is not categorized as a separate disorder in its own right; rather, it is diagnosed as part of a mood disorder within the DSM-V. Like major depressive disorder, to meet diagnostic criteria for PPD, depressed mood or anhedonia must be present for at least two weeks. In addition, some of the following symptoms must be present: sleep and appetite disturbance, loss of energy, feelings of worthlessness or guilt, diminished concentration, and thoughts of suicide (American Psychiatric Association, 2013). Given the overlap between characteristic occurrences of the postpartum experience and PPD (e.g., disruptions in sleep patterns, changes in appetite, excess fatigue), diagnosing PPD often proves challenging (Pearlstein, Howard, Salisbury, & Zlotnick, 2009). Thus, clinicians must disentangle whether the severity of symptoms is related to PPD or if a woman’s symptoms are the consequence of having a newborn infant.

While the DSM-V (American Psychiatric Association, 2013) has defined the peripartum period as an immediate, relatively short period during pregnancy and following delivery, the maximum time interval used to define the postpartum period is controversial in the literature and ranges from a few days to 12 months (Halbreich, 2005). For some women, the postpartum blues simply continues and exacerbates, eventually resulting in clinically significant PPD (Henshaw, 2003). For other women, a brief period
of well-being occurs following childbirth, which is later followed by a gradual onset of depression (Stewart et al., 2003).

The onset of PPD has also been frequently debated in the literature. According to the DSM-IV, the “peripartum onset” specifier is added to the diagnosis of major depression when a depressive episode begins during pregnancy or within four weeks following delivery (American Psychiatric Association, 2013). The ICD-10 criterion, on the other hand, extends this window to six weeks following delivery (World Health Organization, 2007). An apparent limitation of the temporal criteria used within the DSM-V and the ICD-10 is that it excludes all postpartum cases that have an onset of depression later than four and six weeks postpartum. Kornstein (2010) argued that the postpartum specifier should be modified to refer to the onset of episodes of illness within three months, rather than the current four-week specifier, after childbirth to be more consistent with the state of research and expert opinion in this area. On the other hand, Austin (2010) suggested that the postpartum specifier should be extended even further to six months postpartum and advocated for the recognition of neuroendocrine or other biological underpinnings. Conceptualizing a complete and accurate picture of the symptoms associated with PPD clearly has important implications for assessment and treatment.

Prevalence rate of postpartum depression. The prevalence rates of PPD reported in the literature varied considerably depending on the sample selected, whether minor depression is included in PPD assessment, varied definitions and time periods, and reporting style differences. In a meta-analysis, Gavin et al. (2005) reviewed 28 articles that utilized samples of women from developed countries who met criteria for either
major depression (considered PPD) or minor depression throughout pregnancy and within the first year postpartum. Minor depression was defined by the authors as a depressed mood or anhedonia as well as two to four depressive symptoms for at least two weeks. The combined point prevalence estimates for major and minor depression ranged from 6.5 to 12.9% at different trimesters of pregnancy and months in the first postpartum year. Of note, the highest point prevalence of minor and major depression was in the third month postpartum at 12.9%. In the fourth through seventh months postpartum, prevalence of PPD slightly declined and ranged between 9.9 to 10.6%. More recently, Melville, Gavin, Guo, Fan, and Katon (2010) conducted a prospective study and examined the prevalence of major and minor depression reported by postpartum women (N = 1,888) receiving care from an obstetric clinic in the United States. The prevalence of probable major and minor PPD as assessed by the Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2001) was 9.9%, with 5.1% meeting diagnostic criteria for probable major depression and 4.8% meeting criteria for probable minor depression. Among women with probable major depression, approximately one third (29.5%) reported current suicidal ideation. Less than 6% of women with probable minor depression reported current suicidal ideation.

In terms of Canadian prevalence rates of PPD, Chalmers and colleagues (2008) utilized a large, randomly selected sample of Canadian women who had recently given birth (N = 8,542) and found that 7.5% reported PPD symptoms according to the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987). Chalmers et al. (2008) highlighted that the prevalence rate may be low, as the timing of the data collection varied from five to 14 months postpartum, which may have influenced
symptom recall. A study that investigated a sample of postpartum women residing in
Saskatchewan (N = 649), reported that 8.1% met criteria for PPD (Bowen, Bowen, Butt, 
Rahman, & Muhajarine, 2012). Clarke (2008) also investigated the prevalence of PPD in 
Saskatchewan, but specifically targeted a sample of Canadian First Nations and Métis 
women (N = 103). The prevalence rate of PPD in this population was significantly higher 
than the previous study, with 17% of women reporting major depression within the first 
year postpartum, based on DSM-IV criteria (American Psychiatric Association, 2000). 
This finding was consistent with previous reports of cross-cultural PPD prevalence rates 
ranging from 10 to 20% (O’Hara & Swain, 1996).

It should be highlighted that the prevalence rates reported on PPD generally 
pertain to women who are over 18 years of age and involved samples of women residing 
in Western cultures. The same prevalence rates of 10 to 15% for PPD may not hold for 
different age groups or in different areas of the world (Birkeland, Thompson, & Phares, 
2005; Halbreich & Karkun, 2006). Studies of young mothers under 18 years of age 
indicated that PPD may be even more prevalent when compared with women over 18 
years of age. To illustrate, Birkeland et al. (2005) found that 29% of adolescent mothers 
(aged 15 to 19 years; mean age 17 years) who were 3 to 12 months postpartum met 
diagnostic criteria for PPD according to the EPDS (Cox et al., 1987). There may be 
additional risk factors that predispose mothers less than 18 years of age for PPD.

In terms of cross-cultural differences in PPD, Halbreich and Karkun (2006) 
reviewed the literature on the prevalence of PPD in 40 countries and found the prevalence 
of PPD from almost 0.0% to approximately 60.0% in these studies. In countries such as 
Singapore, Malta, Malaysia, Austria, and Denmark, very few reports of PPD were found
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

(ranging from 0.5 to 5.0%). In other countries, such as Brazil, Costa Rica, Italy, and Taiwan, PPD prevalence was significantly higher (ranging from 34.0 to 60.0%). The authors highlighted that the variability in reported PPD might result from cross-cultural variables, reporting style, differences in perception of mental health and its stigma, differences in socio-economic environments, and biological vulnerability factors.

Risk factors associated with postpartum depression. A large body of research has been dedicated to understanding the etiological risk factors associated with PPD (Beck, 2001; O’Hara & Swain, 1996; Robertson, Grace, Wallington, & Stewart, 2004). While the precise etiology of PPD remains unclear, considerable evidence has suggested that PPD is a multifactorial disorder, which comprises a complex interaction of biological, psychosocial, and socio-demographic factors (Bloch, Rotenberg, Koren, & Klein, 2005).

Biological factors. It is unclear if biological factors contribute to the development of PPD. Research in this area has focussed on hormonal changes that occur throughout pregnancy and after childbirth (see Bloch, Daly, & Rubinow, 2003, for a review). Notable hormones that increase during pregnancy include estrogens (i.e., estradiol, estriol, and estrone), progesterone, and cortisol (Zonana & Gorman, 2005). Following childbirth and removal of the placenta, hormones drop substantially, reaching pre-pregnancy levels by the fifth postpartum day (Glover & Kammerer, 2004). As the sex hormones and cortisol are known to have large psychoactive effects, research has tested whether these substantial hormonal changes are related to the development of PPD. Mixed findings have been reported. O’Hara and colleagues (1991) observed significant, but inconsistent, differences in estradiol levels between 182 depressed and non-depressed women from 34 weeks gestation and into the postpartum period. A prospective study of
120 women observed no associations between progesterone levels and PPD from two weeks before delivery to 35 days postpartum (Harris et al., 1994). In contrast, another study of 123 women demonstrated an association between elevated progesterone levels at postpartum day seven and the development of PPD at 6 to 10 weeks postpartum, but did not find an association with estradiol and PPD (Abou-Saleh, Ghubash, Karim, Krymski, & Anderson, 1999). Similar to sex hormones, cortisol levels increase during pregnancy and decrease following childbirth, although it takes several weeks until cortisol returns to pre-pregnancy levels. Evidence has suggested that individuals with PPD have elevated cortisol levels and fail to suppress cortisol output (Meyer, Chrousos, & Gold, 2001).

Studies to date regarding biological etiologies of PPD have yielded mixed results. Taken together, there is insufficient evidence to support a consistent relationship between hormonal changes and the onset of mood disorders following childbirth (Hayes, Roberts & Davare, 2000; O’Hara et al., 1991). The variation in past findings may reflect both the complexity of hormone processes and the inadequacy of methods for tracking hormone changes (Zonana & Gorman, 2005).

**Psychosocial factors.** In the past 25 years, a plethora of prospective and retrospective studies have provided consistent evidence supporting the etiologic link between various psychosocial risk factors and PPD (Beck, 1996; Da Costa, Larouche, Dritsa, & Brender, 2000; O’Hara & Swain, 1996). Four meta-analyses have been conducted to determine the magnitude of the relationships between PPD and psychosocial risk factors (Beck, 1996, 2001; O’Hara & Swain, 1996; Robertson et al., 2004). Evidence from the meta-analyses suggested that prenatal depression and anxiety are among the strongest predictors of PPD (Beck 1996, 2001; O’Hara & Swain, 1996;
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

Robertson et al., 2004). More recent research has also found that prenatal anxiety and prenatal depression are concurrently associated moderately (Karaçam & Ançel, 2009) to highly with PPD (Heron, O’Connor, Evans, Golding, & Glover, 2004). Moreover, evidence in support of a bi-directional model has also been reported, with prenatal depressive symptoms reported in early pregnancy predicting elevated anxiety in late pregnancy, which subsequently predict depressive symptomology in the early postpartum period (Skouteris, Wertheim, Rallis, Milgrom, & Paxton, 2009). Further, Skouteris et al. (2009) also demonstrated that prenatal anxiety symptoms reported in early pregnancy predicted anxiety symptomology in late pregnancy, which also subsequently predicted depressive symptomology in the early postpartum period.

A history of depression, distinct from depression during the prenatal period, was also identified in the four meta-analyses as a strong to moderate predictor of PPD (Beck 1996, 2001; O’Hara & Swain, 1996; Robertson et al., 2004). In line with this evidence, a more recent retrospective study found that women reporting past major depression were up to five times more likely to develop PPD (Milgrom et al., 2008). Similarly, a prospective study also found that women who reported a past history of depression were more than three times more likely to report PPD (Johnstone, Boyce, Hickey, Morris-Yates, & Harris, 2001). Another moderate predictor of PPD identified in the four meta-analyses was low social support provided to a woman by her partner, family member, or friends (Beck 1996, 2001; O’Hara & Swain, 1996; Robertson et al., 2004). Moreover, more specific studies identified that minimal objective social support provided to a woman in the postpartum period was more predictive of her acquiring PPD than other forms of social support and social support provided in the prenatal period (Xie, He,
Koszycki, Walker, & Wen, 2009). An additional moderate psychosocial predictor of PPD that was found in the meta-analyses was stressful life events, such as the death of a loved one, relationship troubles, or relative poverty (Beck 1996, 2001; O’Hara & Swain, 1996; Robertson et al., 2004). This finding was only significant, however, for Western cultures and not in Japanese samples (O’Hara & Swain, 1996).

The Impact of PPD

PPD is an important disorder to treat as it not only impacts the woman, but also impacts the way she interacts with her infant (Lovejoy, Graczky, O’Hare, & Neuman, 2000) and the infant’s short- and long-term development (Tronick & Reck, 2009). If PPD can be assessed early and treated effectively, it is likely that the wide-ranging consequences associated with the disorder can be prevented or addressed early on. In the literature review that follows, a description of the impact that PPD has on the mother, including interactive style and caregiving practices, as well as on the mother-infant bond will be provided. An exploration of the literature that pertains to the short- and long-term consequences associated with PPD on the infant’s cognitive, emotional, and social development will follow.

Mother interaction style. A mother largely constitutes an infant’s social environment and mediates their experience of the social world. Unfortunately, PPD often impacts the nature of this interaction style between a mother and an infant. A meta-analysis that reviewed 46 observational studies on the early interactions of mothers and infants found that mothers who were depressed during the first year postpartum were more irritable and hostile, less engaged with their infant, exhibited less emotion and warmth toward their infant, and had lower rates of play with their infant when compared
to non-depressed mother-infant interactions (Lovejoy et al., 2000). Similarly, a meta-analysis that reviewed 19 studies indicated that PPD not only had a moderate to large effect on maternal and dyadic interactive behaviour, but also had a moderate effect on infant interactive behaviour, suggesting that PPD also impacts the infant’s interactive style (Beck, 1995).

More recent research has investigated mother-infant interaction styles and found that depressed mothers differ with respect to their vocal behaviours, including uttering fewer explanations, suggestions, and questions and offering less verbal affirmations in relation to their infant’s behaviours: for example, a mother offering supportive words to her infant who has rolled over (Herrera, Reissland, & Shepherd, 2004; Kaplan, Bachorowski, & Zarlengo-Strouse, 1999). With regard to frequency and the nature of communication style, one study found that women with PPD communicate less vocally and less visually with their infant and smile less frequently at their infants when compared to non-depressed mothers (Righetti-Veltema, Conne-Perréard, Bousquet, & Manzano, 2002). Ferber, Feldman, and Makhou (2008) also found that depressed mothers touch their infants less often and in a less affectionate manner. Postpartum depressive symptoms have also been correlated with less enrichment activity with the infant, such as reading stories, singing songs, and playing games (Paulson, Dauber, & Leiferman, 2006). Evidence also suggested that mother-infant interaction disturbances among depressed mothers are universal across cultures (Field, 2010; Murray, Fiori-Cowley, Hooper, & Cooper, 1996; Righetti-Veltema et al., 2002).

**Care-giving practices.** Several care-giving practices also appear to be compromised in women afflicted with PPD. The majority of studies on parenting
practices have reported reduced odds of continuing breastfeeding for mothers who report PPD (Dennis & McQueen, 2007; McLearn, Minkovitz, Strobino, Marks, & Hou, 2006). Depressed mothers are also more likely to practice undesirable sleep practices. McLearn and colleagues (2006) found that depressed mothers were more likely to place their infant in the supine sleep position (where the child is placed on its stomach: a condition that is associated with sudden infant death syndrome) instead of the recommended prone sleep position (where the child is placed on its back). A separate study also reported compromised parental sleep practices among women who reported symptoms of PPD, including the greater likelihood of sleeping with their infant, nursing their infant to sleep, and reporting more night time waking more nights per week (Hiscock & Wake, 2001). As adequate nutrition and proper rest practices are imperative during a child’s first few years of life, targeting and effectively treating PPD may have the ability to impact these often compromised care-giving practices.\(^2\) Although such practices present as primary functions of parenting, they have received less attention in the literature than the impact of PPD on mother-infant interaction.

**PPD and child cognitive growth and development.** A body of literature has suggested that PPD has salient yet selective effects on child growth and development. To begin, convincing evidence has indicated that PPD can impact the child’s cognitive development, such as language and IQ, which is evident particularly among boys. A meta-analysis reviewed the effects of PPD on child cognitive and emotional development in children (\(N = 1,473\)) from 1 to 14 years of age (Beck, 1998). Nine studies were

\(^2\)For instance, if a woman afflicted with PPD receives timely and effective treatment for her symptoms, she may be more likely to continue breastfeeding her infant and more inclined to practice proper sleep practices.
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

reviewed, and results indicated that PPD had a small but significant effect on the child’s cognitive and emotional development (.36 to .45, respectively). However, studies in the meta-analysis that had larger sample sizes demonstrated smaller effects on child cognition, suggesting that when there is more power, there is a smaller effect.

More recently, the literature on the link between PPD and children’s cognitive development over time has been inconsistent, with some studies reporting significant associations for male children up to age 11 (Hay, 2010), while others reported no association between PPD and cognitive competence at six years of age (Kurstjens & Wolke, 2001). Moreover, the research suggested that PPD per se does not appear to predict children’s cognitive performance in many studies, rather chronicity and severity of maternal depression does appear to exert considerable influence (Brennan et al., 2003; Grace & Sansom, 2003). This finding is not surprising, as the literature indicated that responsive parenting across the early childhood period enhances children’s cognitive and language development (Cicchetti, Rogosch, & Toth, 1998). Thus, children most at risk for cognitive and language deficits are likely those whose mothers present with chronic and severe depressive symptoms throughout their early childhood years.

**PPD and child emotional and behavioural development.** With regard specifically to a child’s emotional development, in a study of approximately 560 mother-infant dyads, objective evidence of infant emotion regulation difficulties were recorded as early as one month after delivery, with infants of mothers with PPD demonstrating poorer self-regulation, more stress signs, and heightened arousal compared with infants of mothers without PPD (Salisbury et al., 2007). Research has also shown that infants with depressed mothers have a higher incidence of crying or colic (Akman et al., 2006;
Pinyerd, 1992) and have an overall difficult temperament (Britton, 2011). Along the same line, Feldman and colleagues (2009) found that nine-month-old infants of depressed mothers displayed less mature regulatory strategies and higher negative emotionality when compared to infants of anxious and psychologically healthy mothers.

Behaviourally, toddlers of depressed mothers have been found to spend less time following instructions, display more aggressive play behaviour, and spend less time on task when compared with toddlers of non-depressed mothers (Pelaez, Field, Pickens, & Hart, 2008). Infants of depressed mothers have also demonstrated lower social engagement (Feldman et al., 2009). In a longitudinal study, Giles, Davies, Whitrow, Warin, and Moore (2011) also found that recurrent maternal depressive symptoms into the child’s toddlerhood had a marked association with externalizing, internalizing, and total behaviour problems when the child was five years of age. Children of mothers with intermittent maternal depression, on the other hand, did not demonstrate similar behaviour problems. Thus, it appears that the chronicity, or reoccurrence, of depressive symptoms in the early years of a child may result in enduring consequences in the child’s behavioural development.

In summary, a body of literature suggested that PPD is related to short- and long-term consequences of the infant’s cognitive, emotional, and behavioural development. Unfortunately, such consequences are often exacerbated when the depression is recurrent and chronic. Therefore, early identification of PPD along with evidence-based treatment may alleviate the severity and chronicity of depressive symptoms and, in turn, reduce the pervasive effects the disorder has on a child.
PPD Treatment

In general, women afflicted with PPD prefer psychological treatment over pharmacological interventions. A study of 405 women following childbirth reported a significant preference for psychotherapy over pharmacotherapy (Chabrol, Teissedre, Armitage, Daniel, & Walburg, 2004). This finding was particularly significant in breastfeeding women, even after psycho-education about antidepressant medication and breastfeeding was provided. Women with PPD generally prefer psychological interventions over pharmacological treatment for a variety of reasons. For instance, some women fear the transmission of medication into breast milk (Boath, Bradley, & Henshaw, 2004; Chabrol et al., 2004), while others report concern regarding the potential side effects or harm related to long-term medication use (Chan & Levy, 2004) and the stigma associated with taking antidepressant medication (Boath et al., 2004). Consequently, in the last few decades, a number of psychological interventions for PPD have been introduced, including CBT (Austin et al., 2008; Morrell et al., 2009), interpersonal therapy (Clark, Tluczek, Wenzel, & Tluczek, 2003; Klier, Muzik, Rosenblum, & Lenz, 2001; O’Hara, Stuart, Gorman, & Wenzel, 2000), and counselling (Wickberg & Hwang, 1996).

A meta-analysis of 17 controlled and comparative studies of psychological treatments for PPD was conducted (Cuijpers et al., 2008). The researchers reported that psychological interventions were superior to control conditions, with an overall effect size in the moderate range. Along the same line, Sockol, Epperson, and Barber (2011) conducted a meta-analysis to assess the efficacy of both pharmacologic and psychological interventions for the treatment of depression during pregnancy and into the
postpartum period. Twenty-seven studies were reviewed, and evidence for the efficacy of a range of interventions for PPD was provided. All interventions included in the meta-analysis demonstrated symptomatic improvement from pre-treatment to post-treatment and also demonstrated superiority to control conditions, with an overall effect size in the moderate range. As only one study assessing pharmacological treatment was included in the meta-analysis, a comparison of the effect size for pharmacological versus psychological interventions was not computed. Moreover, individual psychotherapy was found superior to group psychotherapy, and there was a trend toward clinic-based treatment having larger effect sizes than home-based treatment. When comparing the different psychotherapy treatments, there was a trend for studies that included CBT or interpersonal therapy to have larger effect sizes than studies that included other psychological interventions. Studies that included an interpersonal therapy intervention had significantly larger effect sizes than those that included a CBT intervention. However, Sockol et al. noted that the studies assessing an interpersonal therapy intervention were more likely to report utilization of a therapy manual, while it was unclear if studies of CBT interventions utilized a manual, and they were also more likely to include other interventions (i.e., not cognitive-behavioural). Thus, the need for further research evaluating well-defined manualized cognitive-behavioural interventions for the postpartum population was highlighted.

While the research is in its infancy, a number of studies have tested the efficacy of both individual and group CBT for the treatment of PPD. In general, mixed findings have been reported. However, a variety of methodological flaws and smaller sample sizes may account for the disparity in the findings. As the focus of this research is the treatment of
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

PPD over the Internet using CBT, a review of controlled treatment studies of face-to-face individual and group CBT will be provided. A discussion of the research limitations evident in the reviewed studies will follow.

**Individual CBT.** Nine randomized control trials (RCTs) have been conducted to test individualized CBT for the treatment of PPD. The first RCT, carried out by Appleby, Warner, Whitton, and Faragher (1997), compared four PPD treatment groups: antidepressant medication (i.e., fluoxetine) plus one or six sessions of CBT, and a placebo plus one or six sessions of CBT. The sample included 87 women who met criteria for PPD at six to eight weeks following childbirth. Analyses indicated that symptom improvement in participants who received fluoxetine was significantly greater than those receiving placebo. Moreover, symptom improvement after six sessions of CBT was significantly greater than after a single session. These differences were evident after the first week of treatment, and improvement in all groups was also evident after four weeks. There was no advantage of combined fluoxetine and CBT over either treatment alone. Because of the variability in the responses over time within each group, the interaction between fluoxetine and CBT was not significant. Appleby et al. concluded that because many women with PPD are reluctant to take antidepressant medication, CBT is an effective alternative therapy.

Prendergast and Austin (2001) also conducted a RCT for PPD and investigated whether early childhood nurses (ECNs) could deliver supervised CBT offered in the participant’s home. Thirty-seven depressed mothers were randomly assigned to either individualized CBT for six weekly sessions provided by trained ECNs or ideal standard care (i.e., mothering advice and non-specific emotional support). Results indicated that
the treatment compliance rates were significantly greater for the CBT treatment group, while the women who received the ideal standard care attended significantly fewer sessions. At the six-week follow-up, a high rate of symptom recovery was reported for both groups. However, there was a very high rate of recovery at initial follow-up with 70 to 80% of all participants reporting minimal PPD symptoms. The findings suggest that for the majority of participants with mild to moderate depression, support offered from an ECN appeared to be as effective as modified CBT. The results of this study, however, should be interpreted with caution. A small sample was used, and the CBT group was slightly more depressed at baseline than the ideal standard care group. Furthermore, approximately 70% of the ECNs used some form of cognitive-behavioural strategies in the ideal standard care group and were, therefore, providing more psychological treatment than the ideal standard care. Finally, nurses with little background and minimal training provided the CBT, thus the quality of CBT may not have been as strong when compared with a clinical psychologist providing CBT.

Another RCT for PPD carried out by Chabrol et al. (2002) compared a one-hour CBT prevention session along with five to eight weekly individual treatment sessions to a control group who received no prevention or treatment intervention. The prevention session was held on the second to fifth day postpartum, while the individualized treatment began four to six weeks postpartum and included an educational component, a supportive component, and a cognitive-behavioural component. The sample consisted of 258 mothers at risk of developing PPD who were randomly assigned to the prevention group or no prevention treatment. Data analysis indicated that compared to the control group, women who participated in the prevention group had significant reductions in the
frequentc of depressive symptoms at four to six weeks postpartum. However, the effect size was only medium, confirming the necessity of adding a treatment intervention for the women who developed PPD despite the prevention. At the eight-week follow-up, the women who participated in CBT reported significantly reduced symptoms of PPD compared to the women in the control condition, who showed little improvement.

Cooper, Murray, Wilson, and Romaniuk (2003) also conducted an RCT of three different treatments for PPD and investigated the short- and long-term effects of the treatments. One hundred ninety-three depressed mothers were randomly assigned to routine primary care, or ten-week individualized CBT, psychodynamic therapy, or non-directive counselling. Four and a half months following the treatment, all treatment groups had significantly lower PPD symptoms compared to the control group. Nine months following the treatment, however, all treatment groups were found to be comparable to routine primary care. Null differences in depressive symptoms between the treatment groups were also reported at 18-month and 5-year follow-ups. The authors highlighted that the rate of long-term recovery in the control group was somewhat higher than evident in other studies and argued that the attention the control participants received in both the recruitment and assessment process could account for their symptom recovery. It is also possible that the long-term improvement in depressive symptoms demonstrated in all groups was the result of spontaneous remission over time.

Misri, Reebye, Corral, and Milis (2004) published an RCT comparing an antidepressant treatment to a combination of antidepressants and 12 sessions of individual CBT for the treatment of comorbid PPD and anxiety. Thirty-five women who met diagnostic criteria for postpartum mood and anxiety disorders were randomly
assigned to a treatment group. Both treatments were highly effective in the treatment of the comorbid disorders. Although there was a trend for the combined treatment group to recover earlier than the antidepressant treatment group, differences were not statistically significant. Further, no statistically significant differences between treatment groups were reported for symptom change suggesting that the combination therapy did not offer additional advantage in treatment of the comorbid postnatal disorders. An apparent limitation of this study was the limited sample size. It is possible that the trend in findings could have reached statistical significance with a larger sample. Further, the CBT protocol utilized was adapted from multiple manuals geared toward the treatment of different disorders (i.e., eating disorders and panic disorder). It remains unclear how this manual was tailored to treat perinatal difficulties.

A more recent RCT, conducted by Morrell et al. (2009), compared individual CBT to individual person-centred therapy, also referred to as non-directive counselling, as well as to routine primary care. Health visitors\(^3\) were trained to deliver the psychological interventions to 2,749 women who were randomly allocated to the two treatment groups. The weekly one-hour treatment sessions were provided over the course of eight weeks. Routine primary care was provided by general practitioners, midwives, and hospital obstetricians. At the six-month follow-up, the intervention groups reported significantly lower symptoms of depression than the control group. The treatment gains were maintained at the 12-month follow-up. Differences between treatment outcome of the CBT and person-centred approaches were marginal.

\(^3\)Health visitors are community health nurses working in the United Kingdom. They are nurses who have undertaken further training to work as part of a primary healthcare team.
Another RCT investigated the efficacy of CBT conducted shortly after labour compared with a treatment as usual routine follow-up session (Wiklund, Mohlkert, & Edman, 2010). All women who gave birth to healthy newborns at a clinic in Norway were informed of the study and invited to participate upon discharge. Of those women who expressed interest in participating, 67 women reported symptoms of PPD one month following delivery. These women were randomly divided to receive either CBT or a routine follow-up session with an experienced midwife or obstetrician. CBT lasted seven weeks and included three weekly one-hour sessions of individual CBT that focused on the prevention and management of stress and low mood. In addition, the intervention included a functional analysis that examined the woman’s behavioural problems and tailored the treatment to focus on behavioural strategies to suit her unique needs. CBT was provided by a cognitive therapist, who was also identified as a midwife. The training or background of the cognitive therapist was not described. One month after treatment, both groups demonstrated a significant symptom decline, with the intervention group demonstrating a greater and more rapid decline of PPD scores than the control group. The authors noted that the remission in depressive symptoms displayed in the control group could be spontaneous or the result of their one session follow-up. A key limitation of this study was that the post-treatment measure was measured only once shortly following the intervention. Thus, it is possible that CBT was effective only in the short term, while it remains unclear if the treatment resulted in a sustained effect after the one month follow up.

Bernard and colleagues (2011) investigated a brief cognitive-behavioural intervention for women with hospitalized premature infants. Targeting trauma and
postpartum depressive symptoms, the intervention consisted of three cognitive-behavioural sessions offered over the course of two weeks. Fifty-six mothers were randomly assigned to receive the brief intervention or a standard care condition. Follow-up measures were administered to all participants one month following their infant’s hospital discharge. The intervention group reported significantly lower levels of depressive symptoms at the four-week follow-up when compared to the treatment as usual group. While there was a trend for lower mean trauma scores in the treatment group, the effect size was small and insignificant.

The most recent RCT for PPD compared general practitioner (GP) treatment alone, GP treatment plus individual CBT provided by a nurse, and GP treatment plus individual CBT provided by a psychologist (Milgrom et al., 2011). The GPs received brief, focussed training to enhance their ability to manage PPD. The nurses completed a half-day training workshop in CBT for PPD, and the psychologist was experienced in CBT treatment for PPD. Both CBT interventions involved the same six-session treatment manuals that were followed by either the nurses or by the psychologist. Sixty-eight women with PPD were randomly assigned to one of the three treatment groups. The women who received the CBT treatments were more likely to exhibit below threshold depressive symptoms at eight weeks post-treatment compared to GP treatment alone. The CBT delivered by the nurses resulted in greater symptom reduction than the CBT delivered by the psychologist. However, the psychologist provided the treatment from a public hospital while the nurses conducted a portion of the CBT sessions out of the client’s home. The difference in treatment delivery locations may have resulted in a possible advantage for the nurse-delivered treatment. An additional limitation of the
study was that the GPs were provided with training on PPD management and thus may have been providing more care and psychological assistance than usual.

**Group CBT.** To date, four RCTs have investigated the efficacy of group CBT in the treatment of PPD and have provided encouraging results. The first RCT, carried out by Honey et al. (2002), compared eight weekly two-hour group therapy sessions to routine care. The treatment incorporated psycho-education, cognitive-behavioural strategies, and relaxation. The sample consisted of 45 women who screened positively for probable PPD, and their most recent child was below 12 months of age. At post-treatment, women who participated in the group therapy sessions had significant improvements on self-reported symptoms of depression as compared with routine care, and such gains were maintained at six months.

The second RCT compared group CBT with group and individual counselling as well as with routine primary care (Milgrom, Negri, Gemmill, McNeil, & Martin, 2005). The CBT and counselling treatment programs were clinic-based and consisted of nine weekly, 90-minute manualized group sessions with the mothers and three sessions involving the partners. Results indicated that all three psychological interventions (i.e., group CBT, group counselling, and individual counselling) were more effective than the routine primary care. While the CBT and counselling groups did not differ significantly, the individual counselling sessions resulted in the greatest symptom reduction. Individual CBT treatment was not investigated. The results suggested that while group psychotherapy is more effective than routine primary care, individual therapy to treat PPD may be the most effective form of treatment. The authors speculated that given that individual counselling was superior to group counselling, individual CBT may likewise
be more effective than group CBT. While an RCT has not compared group and individual CBT for the treatment of PPD, a preliminary study found that individual CBT for PPD is preferred over group CBT, and individual CBT resulted in greater PPD symptom reduction (Highet & Drummond, 2004).

Rojas et al. (2007) conducted the most recent RCT for PPD in Chile on a sample of low-income women. The researchers compared the effectiveness of a group intervention involving psycho-education and CBT to primary care. A sample of 230 mothers who screened positive for PPD were randomly assigned to either the group intervention, which consisted of one session per week for eight consecutive weeks, or primary care (i.e., antidepressant drugs and medical consultation). Women who participated in the group intervention demonstrated the greatest symptom reduction at the three-month follow-up. At six-month follow-up, while the magnitude of the differences between treatment groups diminished, gains in the group intervention remained greater than in the usual care group. The authors concluded that low-income mothers with depression could be effectively treated using group CBT, even in resource-poor countries. While these RCTs conducted to assess group treatment for PPD are important as they inform our understanding of larger, complex group intervention, the studies do not address whether the CBT in particular was an active ingredient of recovery for depressed postpartum women or if it was a combination of strategies (e.g., psycho-education, partner work, relaxation, etc.).

In summary, varying findings have been reported in RCTs regarding the effectiveness of CBT for PPD. In support of individualized CBT, one RCT found that it was an effective preventative measure for PPD (Chabrol et al., 2004), and others found
that individualized CBT was more effective in the treatment of PPD than control comparison groups and routine primary care (Chabrol et al., 2004; Cooper et al., 2003). Individualized CBT was also found comparable to other psychological approaches (Cooper et al., 2003) and resulted in similar symptom reduction as antidepressant medication (Appleby et al., 2003). Other RCTs, however, found that individualized CBT was not more effective than ideal standard care (Prendergast & Austin, 2001) and that it may only be efficacious in the short term (Cooper et al., 2003). The RCTs on group CBT, however, demonstrated more promising and consistent results. Group CBT for PPD appeared to be more effective than routine care (Milgrom et al., 2005; Rojas et al., 2007) and resulted in similar symptom reduction as other psychological treatments (Milgrom et al., 2005).

**Research limitations of CBT for PPD.** In an effort to understand the mixed findings in the reviewed RCTs for PPD, research limitations will be highlighted. First, it was unclear whether some studies of CBT interventions utilized a specific therapy manual unique to PPD (e.g., Milgrom, Martin, & Negri, 1999) or whether these studies simply followed widely accepted and available CBT manuals for major depression (e.g., Beck, Rush, Shaw, & Emery, 1979), manuals for other disorders (e.g., Misri et al., 2004), or if they did not follow any manual. Second, some studies utilized cognitive and behavioural strategies that did not target depression specifically, but rather focused on associated problems such as parenting (e.g., Cooper et al., 2003). Third, many RCTs had other healthcare professionals, such as nurses or health visitors, administer CBT (Milgrom et al., 2011; Morrell et al., 2009; Prendergast & Austin, 2001). While CBT has been found to be effective when delivered by nurses who have received extensive
instruction in CBT (Ekers, Lovell, & Playle, 2006), the nature and intensity of training in CBT was not described in the RCTs. Thus, the fidelity of CBT administered by the other healthcare professionals may not have been reached or maintained had a clinical psychologist trained in CBT offered the treatment. Finally, some RCTs utilized a comprehensive treatment approach involving multiple components that included, but were not limited to, CBT techniques (Chabrol et al., 2002; Rojas et al., 2007). Thus, at this time, the efficacy of CBT for PPD has not been adequately investigated and future research is warranted.

**Under treatment of PPD.** Despite the fact that approximately 10 to 15% of postpartum women experience depression (Gavin et al., 2005) and the growing evidence in support of psychotherapy to treat PPD (Cuijpers et al., 2008; Sockol et al., 2011), a low percentage of depressed women receive treatment during pregnancy or the postpartum period (Vesga-Lopez et al., 2008). Several studies have examined barriers to mental health treatment for PPD. Dennis and Chung-Lee (2006) reviewed 40 articles and found women’s lack of knowledge regarding PPD, self-reported difficulty communicating with practitioners, stigma associated with mental health treatment, and logistical barriers were factors identified in women’s decisions to not seek or not accept treatment. More recently, Goodman (2009) interviewed over 500 pregnant women regarding their attitudes about PPD treatment and perceived potential barriers to accessing treatment. Lack of time, stigma associated with mental health treatment, childcare difficulty, transportation challenges, and financial burden were identified as treatment barriers.
Utilizing the Internet for Therapy

The integration of Internet technology with the practice of psychotherapy is an innovative method for increasing accessibility and affordability in the provision of mental health treatment. According to reports by Statistics Canada, over 80% of all households in Canada have Internet access (Statistics Canada, 2010a), and approximately 70% of Canadians use the Internet to seek medical or health related information (Statistics Canada, 2010b). Given that PPD is vastly undertreated and multiple treatment barriers have been identified with receiving in-person therapy for PPD, utilizing the Internet may be a novel modality to treat women afflicted with PPD who might otherwise not receive treatment. To date, no treatment studies have investigated the effectiveness of Internet CBT to treat women with PPD.

Internet therapy may be particularly well suited to treat PPD, as it potentially addresses many of the barriers identified with in-person PPD treatment, such as transportation difficulties and childcare challenges (Dennis & Chung-Lee, 2006; Goodman, 2009). Internet therapy overcomes these in-person treatment barriers, as women can complete the therapy from the convenience of their home at any time, thereby addressing mobility and childcare challenges. Moreover, given that Saskatchewan is a largely rural province, the online treatment provided with this research had the potential to reach rural women who might otherwise not receive treatment due to transportation challenges. Receiving treatment online from a client’s home is also likely beneficial when a woman is breastfeeding, as she can complete the modules between feedings. Internet therapy can also be completed when the infant is sleeping.
In addition to the logistical barriers addressed through Internet therapy, women with PPD who feel stigmatized by the in-person therapeutic process may be more inclined to seek therapy online if they feel the initial shame is diminished when they are not seeking help in the community or in a therapist’s physical presence (Rochlen, Beretvas, & Zack, 2004). Difficulty conversing with practitioners was also an identified in-person treatment barrier, which again is addressed with Internet therapy where a client works through online therapeutic modules with the support and encouragement of an online therapist via email (Dennis & Chung-Lee, 2006). In fact, in the context of Internet therapy, disinhibition can actually encourage therapeutic expression and self-reflection (Suler, 2000). As described by Rochlen, Zack, and Speyer (2004), “Since the [online] process circumvents a client’s overt persona, there are few, if any, social masks to remove, and clients tend to ‘cut to the chase’ of core issues” (p. 271). Lastly, financial burden was also reported as a treatment obstacle by women with PPD (Goodman, 2009).

A recent RCT compared the cost-effectiveness of three different treatments for general depression: (a) self-administered Internet therapy, (b) treatment as usual (i.e., GP), and (c) self-administered Internet therapy plus treatment as usual (Gerhards et al., 2010). Results indicated that costs were lowest for self-administered Internet therapy, and there were no significant differences in treatment effectiveness for the three groups. Moreover, for this research study, the treatment was provided free of charge.

**Benefits of Internet therapy.** There are commonly cited benefits associated with Internet therapy that logically extend to the online treatment of PPD. For instance, the contemplative process of writing about one’s thoughts, feelings, and problems may in and of itself be therapeutic for some clients (Murphy & Mitchell, 1998). Indeed, one study
 provided empirical evidence that writing about emotional experience is generally helpful (Pennebaker, 1997). Other Internet therapy supporters also argued that text-only communication carries clients beyond the distracting, superficial aspects of a person’s existence and connects the person more directly to the other’s psyche (Suler, 2002). Another advantage of Internet therapy is the option to use the power and technology of the Internet to facilitate supplementary material to clients quickly and easily. As described by Rochlen, Zack, and Speyer (2004): “Whereas traditional therapy takes place in the therapist’s office, limiting the therapist to whatever resources he or she has on the bookshelf, online therapy always takes place in a context with limitless resources” (p. 272).

Preliminary concerns that the Internet therapy approach would be perceived by clients as unacceptable or lacking credibility have been refuted. A survey of potential users of self-help psychotherapies in the United Kingdom found that 91% of respondents reported interest in self-help psychotherapies administered over the computer (Graham, Franses, Kenwright, & Marks, 2001). Further, research has demonstrated that clients do not perceive Internet cognitive-behaviour therapy (ICBT) as less credible than in-person CBT and reported no difference in treatment satisfaction when compared with in-person CBT therapy (Kiropoulos et al., 2008; Klein, Richards, & Austin, 2006).

From a provider’s perspective, Internet therapy also has numerous advantages. Internet interventions have been demonstrated as financially cost-effective (Gerhards et al., 2010) and cost-effective in terms of the provider’s time and resources (Marks & Cavanagh, 2009). In fact, one study found that the frequency of therapist email contact beyond one email per week does not produce any additive clinical outcome effects (Klein
et al., 2009). Thus, one email a week from a provider to a client is often sufficient for therapist-assisted Internet therapy and considerably less time consuming than a typical 50-60 minute in-person therapy session. Moreover, some providers have argued that Internet therapy is an effective means to preserve treatment fidelity by increasing adherence to treatment protocols and manuals: “This [ICBT approach] will prevent ‘therapist drift’ away from structured treatments, and will also facilitate dissemination of CBT to other professionals than trained psychotherapists” (Andersson, 2010, p. 3.)

An added advantage of Internet therapy is that students who are in training to be therapists have the opportunity to seek supervision when responding to a client’s email. Similarly, clinicians can consult colleagues or take time to reflect on their thoughts prior to responding to a client’s email. Lastly, Internet therapy also allows for shorter and simpler treatment interventions that can be offered to clients as an initial step in preventing clinical problems (Calear & Christensen, 2010) or to treat sub-threshold to moderate clinical problems (Cuijpers et al., 2010) prior to alternative complex, time-intensive, and more costly in-person treatments. Arguably, Internet therapy fits well into the stepped-care model of treatment, where more intensive treatments are generally reserved for people who do not benefit from simpler first-line treatments (i.e., Internet therapy) or for those who can be accurately predicted not to benefit from such treatments (Newman, 2000).

**Disadvantages of Internet therapy.** Despite the numerous advantages of Internet therapy, the drawbacks of this modality should also be considered. While computer ownership and Internet access has widely expanded, it is still not universally available, and this is particularly evident in multicultural communities. For instance, a 2005 survey
of 55% of British Columbia First Nations communities found that less than half of the homes were connected to the Internet (First Nations Technology Council, 2005). In 2006, approximately 15% of the Saskatchewan population were First Nation females (Statistics Canada, 2006). Thus, it is possible that some First Nation women afflicted with PPD may not have access to a computer or to the Internet and would be less able to participate in Internet therapy. An additional disadvantage of Internet therapy is the lack of visual and facial expressions. Aside from reported nonverbal behaviour, such as conveying emotions through emoticons (e.g., 😊 to convey happiness, 😞 to convey sadness), Internet therapy does not translate nonverbal behaviours that are undeniably important aspects in the therapeutic process. In addition, with an absence of spontaneous clarification offered by an in-person therapist, Internet therapy also creates the potential for misunderstanding of therapeutic information. However, in the case of therapist-assisted Internet therapy, clients have the opportunity to email their therapist to expand on any vague or unclear information.

The asynchronous nature of Internet therapy may also pose as a limitation by altering the nature of the therapeutic process. For instance, if a client emails their therapist to request elaboration on materials or for additional support, the therapists’ response may be delayed by a few days or even a week depending on the predetermined email frequency. While a time delay may prove beneficial for the therapist (e.g., time to consider and think about response and request supervision or collaboration), it may also increase anxiety and distress in the client. An additional drawback of Internet therapy is that writing proficiency, typing skills, and computer literacy are necessary for both the therapist and client (Rochlen, Zack, Speyer, 2004). For instance, some clients who could
benefit from Internet therapy may in fact be unable to participate if their computer literacy skills are suboptimal. In addition, the effectiveness of Internet therapy may be reduced for individuals who are not comfortable expressing their thoughts and feelings through text and over the computer. Lastly, another debatable concern regarding Internet therapy relates to crisis situations. More specifically, some authors argued that significant problems can arise if Internet therapy clients become suicidal or if the therapist is concerned about the safety of the client (Mitchell & Murphy, 1998). To address this concern, it is imperative that clinicians collect identifying client information, as well as the client’s location and contact information, so that should a client’s safety be at risk, then an emergency management team can be contacted and directed to the client if necessary (Rummell & Joyce, 2010).

**Internet CBT.** While numerous Internet therapy orientations exist, a promising evidence-based Internet treatment is ICBT (Cuijpers et al., 2010; Spek et al., 2007). It has been argued that CBT is particularly well suited for the adaptation to a computer format, as it is a structured treatment approach that can be easily adapted to the online modality (Spek et al., 2007). Further, Kessler et al. (2009) highlighted that the method of online delivery could actually enhance the effect of CBT by encouraging a client’s thought reflection, thereby enhancing metacognitive awareness. There was also ample evidence to support the efficacy of ICBT over other online psychological treatments. A recent meta-analysis involving 92 studies compared ICBT to other online treatment orientations (i.e., psycho-educational, behavioural) and found that ICBT had significantly larger effect sizes compared to all other online interventions (Barak, Hen, Boniel-Nissim, & Shapira, 2008).
The general format of ICBT involves presenting psycho-education, CBT materials, exercises or homework assignments, and relapse prevention information. The psycho-educational component involves information and explanations of a targeted disorder (Barak et al., 2008). For instance, an ICBT treatment study for major depressive disorder included evidenced based information on depression and its treatment (Christensen, Griffiths, & Jorm, 2004). The CBT treatment material centres on strategies to address symptoms that cluster around the physiological, cognitive, and behavioural components of the disorder (Hadjistavropoulos et al., 2011). The exercises or homework assignments are intended to reinforce the client’s learning of the modules and assist with the application of the new information and skills into the client’s day-to-day living. Relapse prevention information typically occurs toward the end of the treatment program and teaches practical strategies for overcoming future episodes of the disorder as well as skills for symptom relapse prevention. ICBT can either be self-directed or therapist assisted. Self-directed Internet therapy involves a client independently working through the treatment. Therapist-assisted ICBT (TACBT) involves a therapist who provides support, guidance, and feedback to the client typically over email.

While new research is examining tailored ICBT (e.g., Andersson, Estling, Jakobsson, Cuijpers, & Carlbring, 2011), generally, the psycho-education and treatment materials of ICBT programs are highly structured and modularized (often ranging from 4 to 12 modules). ICBT treatment also incorporates a range of multimedia options—such as pictures/graphics, animations, audio, and video—which may help to make the treatment more acceptable for persons who prefer formats other than pure text. Research suggested that multimedia options not only enhance the effectiveness of the online
treatment, but are also preferred by clients to static treatments that do not incorporate multimedia options (Barak et al., 2008; Ritterband et al., 2006). A meta-analytic review that compared interactive online treatments with online treatments that used static sites \((N = 65)\) found the effect size of online interactive treatments was significantly higher than static sites that employed didactic and informative techniques (Barak et al., 2008). Further, a study that specifically investigated clients’ perceptions of multimedia options (i.e., audio, graphics, and interactive web-navigation) to an existing Internet therapy program with minimal multimedia found that the presence of these additional components was positive and preferred by participants (Ritterband et al., 2006). In addition to multimedia options, many ICBT programs have self-monitoring options whereby, for instance, a client will rate and track their weekly anxiety, panic, and depressive symptoms.

**Efficacy of ICBT for major depression.** Multiple research groups have assessed ICBT programs to treat major depression and sub-threshold depression (Andersson, Cuijpers, Craske, McEvoy, & Titov, 2010; Cuijpers et al., 2010; Spek, Nyklicek, Cuijpers, & Pop, 2008). A recent meta-analysis involved 22 RCTs of either ICBT or in-clinic computerized CBT, with both of these conditions collectively referred to as “computerized CBT”, versus a treatment as usual or control condition (Andersson et al., 2010, Study Selection section, para. 1). Inclusion criteria included self-guided or therapist-assisted computerized CBT and participants who met diagnostic criteria for major depressive disorder, social phobia, panic disorder, or generalized anxiety disorder. Overall, a large effect size was found for computerized CBT over the treatment as usual and control conditions across all four disorders. For the studies that reported follow-up
data ranging from four to 52 weeks post-treatment, there was no evidence of symptom relapse indicating both short- and long-term benefits of computerized CBT. Furthermore, the meta-analysis suggested that clients adhered to and were as satisfied with computerized treatment as face-to-face treatment, despite the significantly reduced amount of contact with a clinician.

In addition to treating major depression, Spek and colleagues (2008) also investigated whether ICBT is an effective intervention for the treatment of sub-threshold depressive symptoms. Participants \((N = 201)\) were randomly divided into an in-person group CBT treatment or an ICBT treatment. Both treatments were based on the same CBT manual. While the ICBT intervention was not therapist-assisted, participants had the option to call or email a therapist associated with the program. Results indicated that both treatment groups were successful for reducing the sub-threshold depressive symptoms. A main effect approaching significance was found with the ICBT treatment demonstrating greater symptom reduction than the in-person group CBT treatment. Female participants and those who reported a higher educational level demonstrated greater symptom improvement in both treatments. An RCT has also investigated the difference in efficacy between TAICBT and treatment from a general practitioner (Kessler et al., 2009). Participants who received TAICBT were more likely to have recovered from depression at the four-month follow-up than those who received treatment only from a general practitioner. Further, the therapeutic gains were maintained at the eight-month follow-up.

Of significance is that preliminary evidence also suggests that computerized treatment for major depression is comparable in symptom reduction to face-to-face

---

\(^4\) Individuals who have sub-threshold depression report symptoms of depression but they do not meet DSM-IV criteria for major depression.
therapy. In a recent meta-analysis, 21 RCTs were examined to investigate the effects of self-guided treatment for depression and anxiety disorders compared directly with face-to-face psychotherapies for depression and anxiety disorders (Cuijpers et al., 2010). All self-help treatments were cognitive and behavioural in nature and included self-help books \((n = 15)\), in-clinic computerized CBT \((n = 4)\), TAICBT \((n = 3)\), and audio-recordings \((n = 2)\). The mean effects of guided self-help and face-to-face psychotherapy did not differ significantly from each other, and this was also evident at follow-up.

Similar to Andersson and colleague’s (2010) meta-analysis, drop-out rates reported for the two treatment formats were not significantly different. While this meta-analysis was not unique to ICBT and included other self-guided treatments, the results are promising and offer preliminary evidence in support of the hypothesis that guided self-help can be as effective as face-to-face treatment for depression and anxiety symptoms.

Using 14 RCTs, a separate meta-analysis directly compared the efficacy of Internet therapy of different forms (e.g., TAICBT, psycho-education, client-centred) with in-person traditional treatment of the same disorder (Barak et al., 2008). The researchers found no statistically significant difference in symptom improvement between the online treatment modality and the in-person treatment.

**Therapist-assisted ICBT.** TAICBT can be distinguished from self-administered ICBT interventions by support, guidance, and direction provided by a therapist or healthcare professional when the client works through the standardized treatment (Andersson & Cuijpers, 2008). A person who provides therapy online is often referred to as an online therapist. In TAICBT, the online therapist-client correspondence is often asynchronous, typically via email, and often occurs prior to treatment and following the
completed of each module. In a study that investigated online therapist-client
correspondence, it was found that, on average, online therapist and clients were engaged
in formulating emails for two hours over a six week period (Andersson et al., 2005).

As research accumulated, it appeared that for clients diagnosed with major
depression, when compared with self-administered ICBT, some form of guidance was
superior (i.e., TAICBT; Spek et al., 2007). In fact, the published evidence regarding self-
administered ICBT for depression was weak, and drop-out rates were extremely high, and
treatment satisfaction was substantially lower than TAICBT (Christensen, Griffiths, &
Farrer, 2009). This finding was similar to the results of recent review that explored 25
controlled trials of Internet-based treatment for depression (Johansson & Andersson,
2012). The published studies were divided into the following four categories according to
the support provided: (a) no human contact before, during, or after treatment; (b) contact
only before the treatment; (c) contact mainly during the treatment; and (d) contact with
either the research staff or clinicians before, during, or following the treatment period.
Findings indicated differences in between-group effect sizes depending on the degree of
support. The average effect sizes for the respective categories were $d = 0.21, 0.44, 0.659,$
and .76, indicating that greater support resulted in greater symptom change.

**Internet therapy and therapeutic alliance.** Despite the body of literature in
support of the effectiveness of TAICBT, one of the primary concerns that has been raised
with Internet therapy is the potential difficulty, or even inability, for online therapists and
clients to establish a strong therapeutic alliance in the absence of nonverbal cues (e.g.,
eye contact, body language, vocal inflection). Therapeutic alliance, also known as
working alliance or helping alliance, is conceived as the affective bond between a
therapist and a client, the client’s trust in the therapist, and agreement on goals by both the therapist and client (Bordin, 1979; Horvath & Symonds, 1991).

To date, preliminary evidence has suggested that despite the absence of nonverbal cues, the development of an effective therapeutic alliance is possible through Internet therapy. Cook and Doyle (2002), for example, found that clients of email or chat-based therapy rated therapeutic alliance similar and even superior to that of face-to-face therapy. Similarly, another study also demonstrated that therapeutic alliance in email-based therapy is similar to face-to-face therapy for both online therapists and clients (Reynolds, Stiles, & Grohol, 2006). In an analogue study, Mallen, Day, and Green (2003), however, reported higher rating of disclosure, closeness, and satisfaction with the in-person therapy experience when compared with Internet therapy, while no difference in emotional understanding was detected between the two modalities. In a similar fashion, another study found that in comparison to clients in traditional in-person counselling, online clients reported satisfaction with their relationships and treatment online, but were not as satisfied as clients who have undergone traditional face-to-face counselling (Leibert, Archer, Munson, & York, 2006).

With regard to the development of therapeutic alliance specifically in ICBT studies, the evidence was also promising. An RCT study that allocated participants with posttraumatic stress disorder to an online TAICBT treatment group or waitlist control group demonstrated high ratings of the therapeutic alliance for both patients and online therapists, with the majority in the treatment group rating the online therapist contact as positive and personal (Knaevelsrud & Maercker, 2007). Moreover, significant improvement of the therapeutic relationship rated by patients was observed during the
course of treatment. Therapeutic alliance developed with ICBT has also been directly compared to therapeutic alliance fostered during in-person CBT. Kiropoulos and colleagues (2008) conducted an RCT and compared a TAICBT intervention to best-practice face-to-face CBT for people with panic disorder with or without agoraphobia. There was no difference between groups in the degree to which participants developed a therapeutic connection with their therapist. However, participants in the face-to-face treatment group reported higher enjoyment with communicating with their therapist compared to the participants in the online treatment, despite no difference in terms of how much they liked their respective programs and their overall subjective rating of improvement. In a similar fashion, Preschl, Maercker, and Wagner (2011) investigated working alliance\(^5\) between client and therapist in an RCT comparing TAICBT with face-to-face CBT for the treatment of general depression. Confirming previous findings, the two groups’ ratings of the working alliance did not differ significantly, suggesting that an Internet-based intervention has the potential to facilitate a working alliance that is comparable to that formed in face-to-face settings.

**Efficacy of Internet therapy for mothers.** Prior to the proposal of this project, the efficacy of ICBT for maternal depression had not been investigated. Recently, Sheeber and colleagues (2012) published a pilot trial of an ICBT intervention tailored to treat disadvantaged mothers of young children. The Mom-Net program consisted of an eight-module program that included online CBT materials along with weekly telephone coach support. Coaches assisted with applying CBT strategies, addressed barriers to engagement, and responded to questions and emergencies. Participants were 70 women

\(^5\) Working alliance was defined by the authors as “the relationship or collaboration between therapist and patient” (Preschl et al., 2011, p. 2).
with elevated levels of depression, had a child under five years of age, and were attending a low-income program. All participants were compensated with a computer, monitor, printer, and Internet access for their participation in the study. Participants were randomly assigned to the intervention condition or to treatment as usual. Results were promising. Attrition was exceptionally low; participants evidenced high levels of engagement and completed over 75% of the program and the scheduled coach calls. Regarding efficacy, participants in the online condition demonstrated significantly greater reduction in depression compared to the treatment as usual group—an effect size greater than those reported in Internet interventions for general depression. While this program was tailored for mothers struggling with depression, the inclusion criteria were not limited to women who have had a child in the past year (i.e., PPD).

In yet a different study, O’Mahen and colleagues (2013) tested the efficacy of an Internet-based behavioural activation (iBA) program compared with treatment as usual for the treatment of PPD. Depressed women who had given birth over the past year ($n = 910$) were randomly assigned to either condition. The specialized iBA treatment consisted of 11 weekly sessions of behavioural components of CBT that clients worked through over 15-weeks. Cognitive strategies were not incorporated into the program. Although not therapist-assisted, women in the iBA group were sent weekly automated email reminders that included links to the online material and to the homework exercises. The treatment as usual consisted of typical general practice and access to a general depression chat room also available to the iBA participants. Participants in the iBA condition reported a greater improvement in depression scores than women in the treatment as usual group; the change was reliable and clinically significant. Of note,
however, was the high attrition rate, with only 39% of participants completing the iBA program. O’Mahen et al. (2013) suggested that stressors and practical barriers associated with using a community sample, low socioeconomic status, and limited therapist assistance may have contributed to the high attrition rate.

Salonen, Pridham, Brown, and Kaunonen (2013) investigated the efficacy of an Internet-based intervention on perceptions of parenting satisfaction, infant centrality⁶, and depressive symptoms during the postpartum year. Two Finnish hospitals participated in the research, with one hospital offering the intervention and the other offering treatment as usual (i.e., control). A convenience sample of 13,000 women participated in the research. The Internet-based intervention consisted of: (a) an information database, (b) an online peer discussion forum, and (c) a question/answer service. Beginning midway through pregnancy, women participating in the intervention were offered the information database and peer discussion forum, and following labour, they were invited to contact a registered nurse or midwife to anonymously ask questions online for two weeks. Questionnaires were administered at four time points after postpartum discharge, including one week, six weeks, six months, and twelve months. Results suggested that the Internet-based intervention did not affect mothers’ perceptions of parenting satisfaction and depressive symptoms, but resulted in higher infant centrality compared with controls during the infant’s early months.

---

⁶ Infant centrality was defined by the authors as: “how much the infant is in the parent’s thoughts and determines the parent’s actions when the parent is not with the infant or when the parent needs to leave the infant with another caretaker, and how easy it is for the parent to be distracted from thinking about the infant” (Salonen et al., 2013, p. 2).
Chapter Summary

In summary, there was ample empirical evidence to suggest that ICBT is effective in the treatment of major depression and sub-threshold depression. Particularly with online therapist assistance, ICBT holds promise as an effective method for reducing depressive symptoms when compared to treatment as usual, control groups, and treatment from a general practitioner (Cuijpers et al., 2010; Kessler et al., 2009; Spek et al., 2007). Moreover, preliminary findings indicated that ICBT for major depression is as effective as face-to-face therapy for major depression and sub-threshold depression (Cuijpers et al., 2010; Spek et al., 2008). While research has provided evidence for the efficacy of ICBT for depressive symptoms reported by women of young children (Sheeber et al., 2012) and an Internet-based behavioural activation (iBA) program for maternal depression (O’Mahen et al., 2013), research has not determined whether ICBT is an efficacious modality for treating a maternal depression. Evidently, additional research is needed to determine the efficacy of TAICBT for PPD.
CHAPTER THREE: PURPOSE AND OBJECTIVES OF PRESENT STUDY

The present study will contribute to the growing body of TAICBT research by creating a TAICBT program for PPD. The treatment program created was called Maternal Depression Online. Before conducting a larger-scale RCT of this treatment, it was necessary to pilot and evaluate the efficacy of the intervention using a smaller sample (Loscalzo, 2009). Therefore, in addition to creating the treatment program, a primary objective of this study was to recruit women with sub-threshold PPD and full-syndrome PPD and determine whether the seven-module TAICBT program was more efficacious than a waitlist control condition for reducing depressive symptom severity, anxiety symptoms, general stress, and parental stress and for improving overall quality of life from baseline to post-treatment.

A secondary objective of this study was to determine if clients are satisfied with this online modality of treatment. With respect to new treatment programs, it was important to investigate the client’s perception of the quality of treatment and whether it has a quick and readily apparent appeal (McMurty & Hudson, 2000). Further, therapeutic alliance was also investigated to determine if a relationship of trust and attachment can be formed between a woman afflicted with PPD and an online therapist (Cook & Doyle, 2002).

The final objective of this research was qualitative in nature and by using open-ended questions further explored the participant’s perception of Maternal Depression Online. The purpose of these questions was to evaluate the participants’ perceptions of the program that may have been missed in the quantitative measures. The information gathered with these questions will be used to determine how the program can be adapted
and improved for use in the future. As the open-ended questions were exploratory, no hypotheses were formulated. Instead, positive and negative experiences reported by the participants were examined. Barriers and facilitators associated with using the TAICBT program were also investigated. Five hypotheses formed the basis of this research:

1. Based on the findings reported in recent research on TAICBT for general depression (Vernmark et al., 2010) and for depression reported by mothers with children less than five years (Sheeber et al., 2012), it was hypothesized that participants who receive TAICBT would demonstrate greater symptom improvement from pre- to post-treatment than participants who received the waitlist control condition on all primary and secondary outcome measures.

2. In keeping with Morrell et al. (2009), it was hypothesized that participants in the TAICBT group would demonstrate greater clinically significant improvement on the primary outcome measure (i.e., Edinburgh Postnatal Depression Scale), with medium effect sizes, from pre- to post-treatment when compared to the waitlist control condition.

3. For participants treated with TAICBT, it was predicted that all expected symptom improvements would be maintained four weeks following the conclusion of treatment.

4. Given that Internet therapy addresses many of the in-person treatment barriers identified by women with PPD: for example, transportation difficulties, childcare challenges, and stigma associated with mental health treatment (Dennis & Chung-Lee, 2006; Goodman, 2009), it was predicted that the participants would report satisfaction with Maternal Depression Online. It was further hypothesized that participants who
reported an acceptable level of satisfaction with the overall program would exhibit a greater reduction in PPD symptoms over time.

5. In accordance with previous TAICBT research (Knaevelsrud & Maercker, 2007), it was hypothesized that significant associations (medium effect size) would be revealed between post-treatment therapeutic alliance ratings and the post-treatment primary outcome measure (i.e., Edinburgh Postnatal Depression Scale).
CHAPTER FOUR: METHOD

Participants

Recruitment of participants was accomplished through featured newspaper articles, newsletter editorials, radio advertisements and appearances, television appearances, and information presentations to support groups. In addition, information booths were displayed at community events (e.g., Welcome Wagon Baby Shower, Baby Expo) where the researcher discussed the program with potential participants. Posted announcements were also placed at community organizations that offer mother-infant classes (e.g., YMCA) and on hospital maternity wards, pharmacies, community mental health clinics, and medical clinics (see Appendix A). A variety of online recruitment strategies were employed, including social media advertising, classified sites (e.g., Kijiji, Used Regina), and information placed on the MotherFirst webpage (www.skmaternalmentalhealth.ca).

Participants were recruited from July 2012 until May 2013. Inclusion criteria consisted of the following: (a) a score of 10 or higher on the EPDS (Gibson, McKenzie-McHarg, Shakespear, Price, & Gray, 2009), (b) a child under one year of age, (c) access to a computer with the Internet, and (d) be willing to have a family or medical clinic be notified of their participation in the program. Participants were excluded and referred to other services for the following reasons: (a) more than minimal risk of self-harm or suicidality, (b) reporting psychotic or manic symptoms, and (c) reporting a primary substance abuse problem.

The calculation of the power \( \beta \) for the longitudinal mixed-effects model is an involved process employing simulations of the anticipated data and study design (Gelman
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

& Hill, 2007). However, a readily obtained approximation of the proposed power of this study was calculated using a similar study design of repeated measures analyses of variance (ANOVA). Using the GPower program (Erdfelder, Faul, & Buchner, 1996), to achieve power at 90% ($\alpha = 0.05$), $n = 23$ participants per group was required to detect a medium effect size ($F$ test) using repeated measures within-between interaction ANOVA (Faul et al., 2007). This suggests that the power for this somewhat more involved longitudinal mixed-effects model design with repeated measures would be close, at least, to a generally desired standard of power of 80% (i.e. $\beta = 0.80$).

As displayed in Figure 1, a total of 56 potential participants responded to recruitment efforts. Of these individuals, 50 met eligibility criteria, agreed to participate in the study, and were randomized to a research group. The average age in the TAICBT group was 31.52 years ($SD = 5.16$), while the average age in the WLC group was 30.32 years ($SD = 5.26$). Additional participant demographic information for each group is outlined in Table 1. Independent samples $t$-tests (for age) and chi-square analyses (i.e., number of children, marital status, education level, birth complications) were used to compare demographic information between groups. However, three participants later declined to participate due to loss of contact (one in each group) and to an ill child ($n = 1$, WLC group). Thus, a total of 47 participants participated in the study. As illustrated in Table 2, the two groups were not significantly different with respect to demographic variables including age, relationship status, childbirth complications, and parity.

Measures

The outcome assessment measures were divided into three separate areas: (a) the primary outcome measure, (b) secondary outcome measures, and (c) treatment
satisfaction and therapeutic alliance outcome measures. The EPDS (Cox et al., 1987) served as the primary outcome measure and determined the severity of postpartum depression symptoms (see Appendix B). Given that the psychological intervention could also impact general anxiety, general stress symptoms, parental stress, and overall quality of life, the secondary outcome measures were used to assess these variables. Lastly, treatment satisfaction and therapeutic alliance measures were utilized to determine satisfaction with the online program and the degree of therapeutic alliance established between the client and her online therapist. A graphical illustration of the questionnaires administered at screening, baseline, post-treatment, and four-week follow up is presented in Table 3.

**Primary assessment measure.** The EPDS is a 10-item self-report measure that assessed the emotional and cognitive symptoms of PPD as well as reported postnatal anxiety. The items specifically refer to depressed mood, anhedonia, guilt, anxiety, and thoughts of hurting oneself. The EPDS provides statements (e.g., “I have felt sad or miserable”) and asks respondents to rate how much they agree or disagree with the statement based on how they have felt in the previous seven days.
Figure 1. Flow of process for research participants.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>TAICBT ($N = 24$)</th>
<th>WLC ($N = 23$)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>22 (92)</td>
<td>23 (100)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (8)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Relationship Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/Common-Law</td>
<td>22 (92)</td>
<td>18 (78)</td>
</tr>
<tr>
<td>Engaged</td>
<td>1 (4)</td>
<td>-</td>
</tr>
<tr>
<td>Dating</td>
<td>-</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Single</td>
<td>1 (4)</td>
<td>4 (17)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; Grade 12</td>
<td>2 (8)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>High School Diploma; GED</td>
<td>1 (4)</td>
<td>4 (17)</td>
</tr>
<tr>
<td>College/ Some University</td>
<td>7 (29)</td>
<td>2 (9)</td>
</tr>
<tr>
<td>Undergraduate Degree</td>
<td>9 (38)</td>
<td>13 (57)</td>
</tr>
<tr>
<td>Graduate Degree(s)</td>
<td>5 (21)</td>
<td>3 (13)</td>
</tr>
<tr>
<td><strong>Psychological Medication</strong></td>
<td>9 (38)</td>
<td>5 (22)</td>
</tr>
<tr>
<td><strong>Current Tobacco Use</strong></td>
<td>6 (25)</td>
<td>2 (9)</td>
</tr>
<tr>
<td><strong>Current Alcohol Use</strong></td>
<td>8 (33)</td>
<td>15 (65)</td>
</tr>
<tr>
<td><strong>Vaginal Delivery</strong></td>
<td>20 (83)</td>
<td>20 (87)</td>
</tr>
<tr>
<td><strong>Breast Feed</strong></td>
<td>19 (79)</td>
<td>23 (100)</td>
</tr>
<tr>
<td><strong>Twin Births</strong></td>
<td>1 (4)</td>
<td>1 (4)</td>
</tr>
<tr>
<td><strong>Complications with Delivery</strong></td>
<td>12 (50)</td>
<td>9 (39)</td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>11 (46)</td>
<td>11 (48)</td>
</tr>
<tr>
<td>Two</td>
<td>8 (33)</td>
<td>11 (48)</td>
</tr>
<tr>
<td>Three</td>
<td>5 (21)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Four</td>
<td>1 (4)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Childcare Services</strong></td>
<td>10 (42)</td>
<td>8 (32)</td>
</tr>
</tbody>
</table>

*Note.* TAICBT = Therapist-Assisted Internet cognitive-behaviour therapy; WLC = Waitlist control group; Parity = the number of times given birth
Table 2

**Comparisons of Background Characteristics between Groups**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>TAICBT vs. WLC</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s Age</td>
<td>.217</td>
<td>.42</td>
</tr>
<tr>
<td>Relationship Status (married/common law, not married)</td>
<td>2.86</td>
<td>.09</td>
</tr>
<tr>
<td>Education (&lt; high school, &gt; high school)</td>
<td>1.33</td>
<td>.25</td>
</tr>
<tr>
<td>Prescription Medication</td>
<td>.857</td>
<td>.36</td>
</tr>
<tr>
<td>Parity (one child, &gt; one child)</td>
<td>.081</td>
<td>.78</td>
</tr>
<tr>
<td>Birth Complications</td>
<td>1.57</td>
<td>.46</td>
</tr>
<tr>
<td>Childcare Services</td>
<td>.347</td>
<td>.56</td>
</tr>
</tbody>
</table>

*Note.* Independent samples *t*-test values are given for age. All other values are from Chi-square analyses. *Tx* = treatment group; *WLC* = Waitlist control group; *p* < .05.
Table 3

*Scales Administered at Each Assessment Phase*

<table>
<thead>
<tr>
<th>Assessment Tool:</th>
<th>Baseline</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
<th>Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TAICBT</td>
<td>WLC</td>
<td>TAICBT</td>
<td>WLC</td>
</tr>
<tr>
<td>Pre-screening Inclusion / Exclusion Criteria Questions</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>EDPS</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Demographic Questions</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>MINI (Full)</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>MINI (Major Depression Module)</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Depression Anxiety Stress Scale</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Parental Stress Index- Short Form</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>WHO-Quality of Life-BREF</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Credibility/Expectancy Questionnaire</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Therapeutic Alliance Questionnaire</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment Satisfaction Questionnaire-Modified</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

Each EPDS item is scored from 0 to 3 and the total score ranges from 0 to 30. Higher scores indicate more severe PPD symptoms. The cut-off score used on the EPDS varies depending on its purpose and whether it is used for broad screening or to identify women with more severe depressive symptoms. While a cut-off score of 13 or more is taken to suggest major depressive symptomatology, a lower threshold of 10 or more is used to screen for minor depression, to increase sensitivity, and has been recommended for community settings to ensure all potential cases of PPD are identified (Gibson et al., 2009). The EPDS cut-off score of 10 or more was confirmed by Murray and Carothers (1990) and recommended by Harris, Huckle, Thomas, Johns, and Fung (1989). Thus, for the purpose of this study, a cut-off score of 10 or more was selected, as the research was conducted in a community setting and the program was offered to treat sub-threshold PPD or greater (i.e., minor depression and major depression). Further, previous studies of in-person CBT for PPD utilized a cut-off score of 10 or more and demonstrated clinically significant findings (Appleby et al., 1997; Austin et al., 2008; Rojas et al., 2007).

In terms of the EPDS’s psychometric properties, the measure has demonstrated excellent reliability ($\omega = .88$) and test-retest reliability (Cox et al., 1987). Gibson et al. (2009) conducted a literature review of 37 studies that utilized the EPDS and found that sensitivity values for the English EPDS studies ranged from 76 to 100%, while specificity values ranged from 0 to 99%. Further, while the EPDS is typically administered as a pencil-and-paper test, computerized versions are now available and correlate highly with the pencil-and-paper version (Glaze & Cox, 1991). The EPDS has also demonstrated good convergent validity with other validated self-report measures of depression (Clarke,
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

2008; Cox et al., 1987) as well as with the structured clinical interview for DSM-IV mood disorder diagnosis (Beck & Gable, 2001).

Research has also validated two subscales within the EPDS. More specifically, a principal component analysis with varimax rotation was carried out on the measure (Brouwers, van Baar, Pop, 2001; Ross, Gilbert Evans, Sellers, & Romach, 2003). Findings confirmed that the EPDS has both a depression factor and an anxiety factor. In the current study, the EPDS demonstrated acceptable internal consistency, $\alpha = .70$.

**Secondary assessment measures.** The Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995) is a 42-item self-report questionnaire that measures symptoms of depression, anxiety, and stress (see Appendix C). Participants were administered the DASS-21, which contains 21 items that were extracted from the original 42-item DASS (Lovibond & Lovibond, 1995). The items from DASS-21 can be reliably grouped into three scales. The depression scale includes items that measure symptoms typically associated with dysphoric mood, such as sadness and worthlessness. The anxiety scale includes items related to physical arousal, panic, and fear. Finally, the stress scale includes items that measure symptoms such as tension, irritability, and the tendency to overreact to stressful events. Each scale consists of seven items that are presented as a series of statements (e.g., “I found it difficult to relax”). With reference to the past week, participants are asked to respond to each item on a Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, most of the time). Totals for each scale are doubled, so that they are comparable to scores from the 42-item DASS, and the same cut-off scores can be utilized for both the short and long measures (Henry & Crawford, 2005). Interpretation of the DASS-21 is based primarily on the use of cut-off scores.
Lovibond and Lovibond (1995) presented severity ratings ranging from “normal” to “extremely severe” on the basis of percentile scores, with 0 to 78 classified as normal, 78 to 87 as mild, 87 to 95 as moderate, 95 to 98 as severe, and 98 to 100 as extremely severe.

The original validation study of the DASS-21 included nonclinical respondents and respondents with clinical disorders including major depression (Antony, Bieling, Cox, Enns, & Swinson, 1998). In both samples, the DASS-21 demonstrated good construct validity according to factor analysis; excellent internal consistency for the depression, anxiety, and stress scales (α = .94, .87, and .91 respectively); and acceptable concurrent validity with other validated measures of depression and anxiety. The Internet-administered version of the DASS has demonstrated excellent internal consistency for each scale (depression α = .95; anxiety α = .93; stress α = .94), and the three scales were highly inter-related (Zlomke, 2009). The psychometric properties of the DASS-21 have been assessed in a population of postnatal women with and without PPD (Miller, Pallant, & Negri, 2006). In a sample of 325 primiparous mothers with a child under six months in age, the DASS-21 demonstrated adequate reliability for each subscale: depression (α = .84), anxiety (α = .77), and stress (α = .86). Further, Miller et al. argued in support of the DASS-21’s ability to disentangle classifications of depression, from anxiety and stress and demonstrated its capacity to identify comorbid classifications. In the current study, the DASS-21 demonstrated acceptable internal consistency for each subscale: DASS-Depression α = .81; DASS-Anxiety α = .77; and DASS-Stress α = .78.
The Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995) is designed to measure stress in a parent-child system and can be used for parents of children as young as one month (see Appendix D). This 36-item measure was derived from a series of exploratory factor analyses of the original 120-item Parenting Stress Index (Abidin, 1983). The original factor analysis of the PSI-SF indicated a three-factor solution (Abidin, 1995). The parental distress subscale reflects a parent’s perception of child-rearing competence, conflict with her/his spouse or partner, social support, and stresses associated with the restrictions placed on other life roles. The parent-child dysfunctional interaction subscale provides an indication of parents’ dissatisfaction with interactions with their child and the degree to which parents find their child unacceptable. The difficult child subscale measures the parent’s view of the child’s temperament, defiance, noncompliance, and demandingness. Each subscale consists of 12 items rated from 1 (strongly disagree) to 5 (strongly agree). Subscale scores range from 12 to 60, while the total PSI-SF score ranges from 36 to 180. An example of an item is “I feel trapped by parenting responsibilities”. Higher scores on the PSI-SF are taken to suggest greater levels of parental stress. The original validation study of the PSI-SF demonstrated good internal consistency for each subscale (α ranging from .85 to .91), acceptable test-retest reliability over a six-month retest interval, and the measure was highly correlated with the original PSI-SF (Abidin, 1995). In the current study, the PSI-SF exhibited acceptable internal reliability: PSI-Parental Distress α = .77; PSI-Parent-Child Dysfunction α = .87; and PSI-Difficult Child α = .90.

The World Health Organization Quality of Life Assessment BREF (WHOQOL-BREF; Skevington, Lotfy, & O’Connell, 2004) is a 26-item measure designed as an
abbreviated version of the 100-item WHOQOL measure (see Appendix E for the BREF version). The WHOQOL-BREF assessed four domains related to quality of life including: (a) physical health (seven items including sleep and pain), (b) psychological health (six items including self-esteem and concentration), (c) social relationships (three items including social support and personal relationships), and (d) environment (eight items such as physical safety, financial resources, and recreation). The measure also includes two items that assess overall quality of life and general health. Questions are rated with reference to the past two weeks. An example of a WHOQOL-BREF item is: “To what extent do you feel your life is meaningful?” Respondents are asked to indicate their response on a 5-point Likert scale ranging from 1 (not at all) to 5 (an extreme amount). Four domain scores are obtained by calculating the mean score of the items within each domain. The mean scores are then multiplied by four to obtain domain scores comparable to the scores used in the WHOQOL-100. Higher scores on this measure indicate higher quality of life.

The WHOQOL-BREF was originally validated from data derived from 20 field centres situated within 18 countries and included healthy subjects and medical subjects (Skevington et al., 2004). For each of the four domains, the WHOQOL-BREF demonstrated good internal consistency (α ranged from .66 to .84), acceptable test-retest reliability, and excellent discriminant validity (Skevington et al., 2004). Recent research has investigated a computerized version of the WHOQOL-BREF as an alternative to the paper version (Chen et al., 2009). Results indicated no significant differences in domain scores between the two versions, and the computerized version demonstrated acceptable internal consistency (α ranged from .60 to .83) and good concurrent validity. With regard
to the postpartum population, the WHOQOL-BREF has been validated on a large sample of women following childbirth (Webster, Nicholas, Velacott, Cridland, & Fawcett, 2010). The sample included women with and without PPD, and results indicated that the measure had adequate internal consistency ($\alpha$ ranged from .69 to .78), good construct validity, and discriminated between depressed and not-depressed women. In the current study, the four WHOQOL-BREF domains demonstrated acceptable internal consistency: WHOQOL-Domain 1 $\alpha = .65$; WHOQOL-Domain 2 $\alpha = .67$; WHOQOL-Domain 3 $\alpha = .65$; and WHOQOL-Domain 4 $\alpha = .87$.

**Treatment relevant outcome measures.** The Therapeutic Alliance Questionnaire (TAQ) assessed the degree to which a client perceives the helpfulness of her relationship with the e-therapist (see Appendix F). The TAQ contains 17 items and was developed from the 19-item revised Helping Alliance Questionnaire (HAQ-II; Luborsky et al., 1996). The TAQ provides a series of statements (e.g., “I felt my therapist understood those concerns that were important to me”) that are rated on a Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The items are summed to produce a total score ranging from 17 to 102. The higher scores indicate a greater degree to which the client perceived her relationship with her e-therapist as helpful.

While the HAQ-II has demonstrated acceptable reliability ($\alpha = .64$) and convergent validity with other measures of therapeutic alliance (Bassler, Potratz, & Krauthauser, 1995), to date, no psychometric studies have been conducted specifically on the TAQ. However, multiple TAICBT studies have utilized this measure to assess therapeutic alliance (Kiropoulos et al., 2008; Klein et al., 2006; Klein et al., 2009).

---

7 Given that the WHO subscales are composed of few items (i.e., 3-8 items), the lower Cronbach’s alpha was expected and is considered acceptable (Field, 2009).
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

Further, other validated measures of therapeutic alliance include items that would not be appropriate to assess therapeutic alliance developed during an online relationship.\(^8\) In the current study, the TAQ demonstrated excellent internal consistency, \(\alpha = .94\).

The Treatment Satisfaction Questionnaire-Modified (TSQ; Cox, Fergus, & Swinson, 1994) assessed a client’s perceived satisfaction with Maternal Depression Online (see Appendix G). The TSQ comprises 33 items that are grouped into four domains: (a) the usefulness of the treatment components (ten items); (b) how much the participant liked the treatment components (ten items); (c) perceived symptom improvement (five items); and (d) lifestyle improvements (five items). Items are rated on an 8-point Likert scale ranging from 0 (not at all) to 7 (very much so). The TSQ also includes the following three items: “How much did you like the treatment program?” “How much did you enjoy communicating with your therapist?” and “Overall, how much improvement do you believe occurred, after completing the treatment program?” As the TSQ was created to measure treatment satisfaction for a panic disorder treatment, the measure was modified to pertain to the specifics of this treatment. No reliability or validity data were provided by the authors (Cox et al., 1994), and to date, a psychometric evaluation has not been conducted on the TSQ. However, the measure has been used in numerous Internet-based treatment studies of panic disorder and agoraphobia (Kiropoulos et al., 2008; Klein et al., 2006; Richards, Klein, & Austin, 2006) and is currently being used to measure treatment satisfaction for Depression Online offered by the Online

\(^8\) To illustrate, the commonly used Working Alliance Inventory-SR (Hatcher & Gillapsy, 2006) includes items that would not apply to online therapy. An example of an item is: “We agree on what is important for me to work on”. This item would not be appropriate, as the TAICBT modules for this project are standardized, and it would not be typical for a client and an e-therapist to explicitly discuss treatment goals.
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

Therapy Unit. In the current study, the four domains of the TSQ demonstrated acceptable internal consistency: TSQ-Part A $\alpha = .92$; TSQ-Part B $\alpha = .93$; TSQ-Part C $\alpha = .95$; TSQ-Part D $\alpha = .90$; and TSQ-Part E $\alpha = .81$.

The Credibility/Expectancy Questionnaire (CEQ; Devilly & Borkovec, 2000) measured credibility and treatment expectancy of Maternal Depression Online at post-treatment (see Appendix H). Consisting of six items, the measure assesses a respondent’s perception of treatment credibility with four items that focus on thoughts about the treatment (e.g., “How logical does the therapy offered seem to you?”), while treatment expectancy is measured with two items that focus on feelings (e.g., “How much do you really feel that therapy will help you reduce your symptoms?”). Items are rated either on a 9-point Likert scale ranging from 1 (not at all) to 9 (very much) or a 0 to 100% scale. A score is provided for each construct (i.e., expectancy and credibility). Factor analysis indicated that the CEQ contains two factors that are stable across populations: (a) a cognitive-based credibility factor and (b) an affective-based expectancy factor (Devilly & Borkovec, 2000). The original validation study of the CEQ demonstrated good internal consistency within each factor ($\alpha$ ranging from .79 to .90 for expectancy and .78 to .81 for credibility), high internal consistency for the whole scale ($\alpha = .85$), and acceptable test-retest reliability ($r = .83$). The CEQ has shown good incremental validity in treatment outcomes in a sample of individuals undergoing treatment for posttraumatic stress disorder (Devilly & Borkovec, 2000).

Open-ended questions. Following the self-report questionnaires, participants who completed the TAICBT program also completed 10 open-ended written questions about their experiences with Maternal Depression Online (see Appendix I). The aim of
the open-ended questions was to understand the client’s experience with the program from her own perspective rather than according to a universalizing framework (Hadjistavropoulos & Smythe, 2001). The questions addressed aspects including overall experience with the program, any positive and negative experiences, and ways the program can be improved.

**Participants and Procedure**

Ethics approval for this study was obtained from the University of Regina Research Ethics Board, the Regina Qu’Appelle Health Region, and the University of Saskatchewan (see Appendix J). This study was conducted in collaboration with the Online Therapy Unit for Service, Education, and Research (Online Therapy USER) located at the University of Regina under the direction of Dr. Heather Hadjistavropoulos. In 2010, the Online Therapy Unit licensed the rights to utilize and adapt Anxiety Online (www.anxietyonline.org.au/) to treat three disorders: major depression, generalized anxiety disorder, and panic disorder. Anxiety Online is a TAICBT program that was developed by a team of researchers at Swinburne University of Technology in Melbourne, Australia (Klein & Richards, 2001). There is considerable evidence to support Anxiety Online for the treatment of generalized anxiety disorder and panic disorder (Klein et al., 2012).

**Screening interviews.** In order to participate in the treatment study, all potential participants underwent a brief telephone pre-screen interview as well as a lengthier telephone full-screen interview. The pre-screening interview was used to determine if a participant met preliminary eligibility criteria, scored 10 or more on the EPDS, and did
not endorse suicidal intent or report a suicidal plan. If the participant was deemed appropriate, she was invited to participate in the full-screen interview.

**Full-screen interview.** Participants completed the full-screen interview directly following the pre-screen interview or at a later date. The purpose of the full-screen interview was to establish whether a participant met either current DSM-IV-TR diagnostic criteria\(^9\) for major depression or subclinical criteria for major depression. In addition, this interview determined whether the participant met current DSM-IV-TR criteria for bipolar disorder, psychosis, or substance abuse or dependence, or endorsed current suicidal intent or a suicidal plan. The full-screen interview took approximately 30-45 minutes and began with asking the client to verbally consent to the interview. The administration of the MINI International Neuropsychiatric Interview (MINI; Sheehan et al., 1998; also see Appendix K) followed. The MINI is a structured clinical interview that allows researchers to make diagnoses for 17 *Diagnostic and Statistical Manual* Axis I psychiatric disorders (American Psychiatric Association, 2000). The telephone version of the interview has been validated (Roccaforte, Burke, Bayer, & Wenge, 1992), and the MINI has been used to screen major depression in previous TAICBT research (Perini, Titov, & Andrews, 2009; Titov et al., 2010). The MINI has demonstrated excellent inter-rater reliability for diagnosing major depression ($\kappa = 1.00$), test-retest reliability is good ($\kappa = .87$), and the interview has been found to correlate with other structured diagnostic interviews (Sheehan et al., 1998). A variety of demographic questions followed the MINI

---

\(^9\) Given that the interviews were conducted before the publication of the DSM-5 (American Psychiatric Association, 2013), the DSM-IV-TR (American Psychiatric Association, 2000) criteria were used to assess for psychological disorders.
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

(see Appendix L). After the completion of the full-screen interview, the potential participant was informed immediately if she was appropriate for services.

**Randomized assignment.** If a participant was eligible to participate in the research (i.e., met all inclusion criteria and did not endorse exclusion criteria), she was randomized to receive either TAICBT or to a 7-10 week waitlist control condition (allocation ratio of 1:1). A PhD student who was not involved in the research or affiliated with the same laboratory conducted the randomization process. When a screening interview was scheduled, the researcher contacted the student and requested a group allocation. The group allocation was accomplished by the student using a computer-generated list of random numbers provided from the online program Research Randomizer (http://www.randomizer.org/). Using a JavaScript, the program is designed to generate random numbers or randomly assign participants to different experimental conditions. Participants were allocated in equal numbers to each intervention using simple randomization.

**Waitlist control condition.** In similar fashion to the control condition used in Austin and colleagues’ (2008) study, the participants who were randomly assigned to the waitlist control group (WLC) received an information pamphlet (see Appendix M). The MotherFirst campaign created an information pamphlet that is currently available to Saskatchewan healthcare providers, various support groups, and is displayed in places frequented by new mothers and their families (MotherFirst Working Group, 2010). The chair of MotherFirst agreed that their information pamphlet could be used for the purpose of the control condition. The pamphlet contains information regarding risk factors for PPD, triggers for postpartum distress, and strategies to prevent and/or manage such
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

problems. The pamphlet also includes a contact number and a website for postnatal support services offered in Saskatchewan. Participants were briefed with the information on the pamphlet and informed of the postnatal support contact should they choose to receive treatment.

In addition to the pamphlet, the women assigned to the control condition were also emailed a website link to FluidSurveys (http://fluidsurveys.com/) that included an information page and a consent form (see Appendix N). A battery of baseline outcome measures followed. Seven to 10 weeks following the baseline assessment, women assigned to the control condition were contacted by email and asked to fill out the outcome measures for a second time and a questionnaire regarding treatment they received during the waitlist period (see Appendix O). Once the measures were completed, the women were contacted by telephone and offered the treatment, if still interested.

TAICBT Intervention

Depression online. As an ICBT program has not been developed to treat PPD, I adapted the Online Therapy USER’s Depression Online program (Hadjistavropoulos et al., 2011) into a specialized TAICBT program for PPD. Depression Online consisted of 12 interactive online modules, with each module beginning with a mood rating, an Internet therapist check-in, and psycho-education focused on the module’s topic. All modules were dedicated to teaching specific skills designed to target unhelpful behaviours (e.g., sleep problems, poor diet, social isolation) and maladaptive cognitions (e.g., negative thoughts, automatic thoughts, unhelpful assumptions). With the completion of each module, weekly offline “homework” activities were assigned to solidify and incorporate the new strategies into the client’s daily life. While Depression
Online was designed for clients to complete one module a week for a total of 12 weeks in the program, the majority of the participants typically took more than 12 weeks, and in fact, some participants have even required more than 24 weeks to complete the program. This finding is congruent with other TAICBT research that reported clients often take additional time completing the modules (Perini et al., 2009). The effectiveness of the Depression Online program offered in Saskatchewan is currently being evaluated with regard to its effectiveness.

**Adaptation of depression online.** Maternal Depression Online was based on Milgrom et al.’s (1999) in-person CBT program for PPD. Given that treatment studies for in-person CBT for PPD typically range from six to eight sessions (Austin et al., 2008; Morrell et al., 2009; Prendergast & Austin, 2001) and TAICBT studies for major depression often range from five to eight modules (Andersson & Cuijpers, 2008; Mackinnon, Griffiths, & Christensen, 2008; Perini et al., 2009), the Depression Online program was shortened from 12 modules to seven modules. In support of this idea is a recent RCT that provided evidence of the effectiveness of a seven-week in-person CBT intervention for PPD (Wiklund et al., 2010). Further, as noted by Austin and colleagues (2008), simpler and briefer treatments for PPD are more likely to be adopted into the primary healthcare setting over more costly, complex, and lengthier interventions. Therefore, the shorter Maternal Depression Online program may be as effective and more widely disseminated in the future when compared with longer interventions. Finally, as time is a limited resource for new mothers, it is likely that the modified, brief, standardized intervention based on CBT principles was appreciated over a lengthier 12-module program.
Following a review and comparison of the Milgrom et al. (1999) CBT for PPD program and Depression Online, it was noted that Depression Online includes numerous modules that are not the primary focus of CBT (e.g., mindfulness training, education on lifestyle factors). Five modules that did not focus on cognitive and behavioural strategies were removed, resulting in a seven-module treatment. The revised program maintained Depression Online’s session structure (i.e., a combination of psycho-education, skills training, experiential practice), but incorporated adaptations relevant to mothers of young infants. For instance, Maternal Depression Online included examples that are specific to women with PPD, provided relevant psycho-education, and presented appropriate visuals for the maternal population (e.g., images of women and children). A comparison of the content in modules in Depression Online to Maternal Depression Online is presented in Appendix P.

Clients received one email a week from their assigned Internet therapist. The Internet therapists primarily included me, as the researcher, and one doctoral graduate student in clinical psychology who was trained in the provision of TAICBT. The training involved a one-day workshop facilitated by the Online Therapy Unit and included general education on ICBT, along with a review of Internet clinical practice issues (i.e., online screening and assessment, client education about Internet services, online informed consent, and assessing patient outcomes). As the researcher, I was supervised by Heather Hadjistavropoulos, PhD, RD Psych, a registered doctoral psychologist and expert in TAICBT. All emails sent by the doctoral graduate student were reviewed by me, as the researcher, in order to ensure treatment fidelity.
TAICBT Treatment Setup

Once randomly assigned to receive TAICBT, a participant account was created on the Maternal Depression Online website. When a participant logged onto the system for the first time, she was prompted to change her password and was provided with instructions on how to make it as secure as possible. The participant was then orientated to the site. In addition, with the client’s consent, a letter was sent to a family physician or another medical contact informing them of their patients’ participation in the Maternal Depression Online Program (see Appendix Q). This contact was filed for the event of an emergency.

Similar to the control group, the pre-treatment and post-treatment measures were completed on the website FluidSurveys (http://fluidsurveys.com/). Once participants provided their informed consent, they received an email that included a link to FluidSurveys where the pre-treatment measures were found (see Appendix N). Seven to ten weeks following pre-treatment assessment, TAICBT participants were emailed again with a second link to FluidSurveys and asked to complete the post-treatment assessment measures. While 42% of participants completed the seven-module program in less than 10 weeks, 58% of participants required additional time to complete the treatment. Therefore, a 10-week standard follow-up time was implemented to control for time passed with the control group. In addition to the post-treatment questionnaires, participants were also contacted by telephone four weeks following treatment completion and administered the EPDS to discern if they met diagnostic criteria for PPD and to provide a longer-term follow-up of depressive symptoms (see Appendix B).
 Analyses

**Longitudinal mixed-effects model.** In order to test the hypothesis that participants receiving TAICBT would evidence greater improvements in PPD, a longitudinal mixed-effects model was computed. While no consensus exists regarding how missing responses should be handled (Hollis & Campbell, 1999), the use of longitudinal mixed-effects model has substantially increased during the last 10 years (Gueorguieva & Krystal, 2004). This analysis provides a general framework for the analysis of repeated measures and allows for estimation of average time trends for treatment groups and of the individuals’ response over time. As discussed by Gueorguieva and Krystal (2004), the longitudinal mixed model uses all data on each subject, is unaffected by randomly missing data, and it can flexibly model time affects. Given that the EPDS was administered at four time points (i.e., baseline, pre-treatment, post-treatment, four-week follow-up), this model provided a flexible framework for the analysis of repeated measures. An assumption of mixed-effects models is that individuals deviate randomly from the overall average response; therefore, missing data were accounted for. In all mixed-model analyses, random intercept models were used, and a maximum likelihood method and covariance type based on the variance components were employed to provide the estimates. A total of three separate mixed-model analyses were conducted and investigated: (a) the impact of treatment and time on symptoms of PPD, (b) the impact of treatment and time on symptoms of postnatal anxiety, and (c) if a change in PPD symptoms over time was influenced by treatment satisfaction or therapeutic alliance.
**Clinical significance.** To further assess the efficacy of TAICBT on PPD symptoms, the second hypothesis determined if the treatment had a meaningful impact on individual clients by assessing clinically significant change. As the focus of the TAICBT treatment was on PPD symptoms, the EPDS was used to determine clinical significance of the program. While various methods have been proposed to measure the clinical significance of a treatment, the 1991 Jacobson and Truax method has remained the most popular (Atkins, Bedics, Meglincey, & Beauchaine, 2005) and has been recommended for use in outcome studies (Bauer, Lambert, & Nielsen, 2004). The original manuscript (Jacobson, Foilette, & Revenstorf, 1984) along with minor changes (Jacobson & Truax, 1991) suggested a two-step method to determine clinical change.

The first step involves determining whether the change in score on the measure is large enough to indicate probable real and reliable change through calculating a reliable change index (RCI). Using 181 participants, Matthey (2004) calculated an RCI using the EPDS and concluded that a four-point change on the measure is required to achieve a 95% confidence that real change has occurred. The second step of the Jacobson method is to determine whether a client’s symptom change indicates “recovery”, “improvement with recovery”, “no change”, or “deterioration”. Matthey suggested that a participant moving from a score of 10 at the start of treatment to that of 10 or less following treatment, and whose score has changed by at least four points, can be considered to have moved from the dysfunctional population to the healthy population and would thus be classified as “recovered”. Those who demonstrate a reliable change following treatment (decrease in score of four or more points), but are still scoring 10 or more, would be classified as “improved—but not recovered”; while those showing a reliable change (four
points or more) with an increase in their score would be classified as “deteriorated”. A client whose pre-post difference score is less than that required by the RCI (four points) would be classified as “no change” regardless of whether or not their post score fell below the cut-off score.

**Multiple regression analyses.** To determine if participants receiving TAICBT would evidence greater improvements on the secondary outcome measures (i.e., DASS, PSI, WHO-QOL) when compared with the TAU group, a series of multiple regressions were computed. For these analyses, the scores on the post-treatment measures (i.e., DASS, PSI, WHO-QOL) were set as dependent variables in the regressions, while time (i.e., duration of treatment in weeks), treatment group (i.e., TAICBT, TAU), and pre-treatment score on the measure\textsuperscript{10} were set as independent variables. In support of the hypothesis, it was expected that the independent variables (i.e., time, treatment group, pre-treatment score) would significantly predict the dependent variable (i.e., post-treatment score).

Two separate multiple regression analyses were computed for each dependent variable: (a) a multiple regression using the original data without missing data accounted for, and (b) a multiple regression using data sets with missing data accounted for through the multiple imputation (MI) method (Rubin, 1987). As described by White, Royston, and Wood (2011), MI utilizes the distribution of the observed data to estimate a set of plausible values for the missing data. Random components are then incorporated into these estimated values to reflect their uncertainty. Multiple data sets are created and then

\textsuperscript{10} A score on a particular measure at Time 1 was included as a predictor variable in the regression as it was considered a major explanatory variable. Including this variable in the regression equations served as a control variable (i.e., treatment and group competes against where the participant started at Time 1).
are individually analyzed to obtain a set of parameter estimates. Given the small sample size and the minimal missing data in this study, five data sets using the MI method were created and analyzed (White et al., 2011). The estimates of the five data sets were combined to obtain overall estimates, variances, and confidence intervals. Unstandardized coefficients were used as a measure of effect size to assess the proportion of variance associated with or accounted for by each of the regressions (Preacher & Kelley, 2011). The results of the two regression analyses for each dependent variable (i.e., analyses computed with original data and analyses computed with data sets without missing data) were compared to determine if the missing data impacted the results.

**Four-week follow-up.** Hypothesis three determined if participants who were treated with TAICBT maintained their depressive symptom improvement four weeks following the conclusion of treatment. Because the WLC condition was provided access to the TAICBT program after completion of the post-test measures, a between-subjects examination of effects was not possible for the four-week follow-up. Therefore, within-subjects analyses for participants in the TAICBT condition were conducted comparing follow-up EPDS scores (Time 4) with post-treatment EPDS scores (Time 3) and baseline EPDS scores (Time 1).

**Analysis of treatment variables.** To test the fourth and fifth hypotheses investigating treatment satisfaction, therapeutic alliance, and treatment expectancy, descriptive data are first presented on treatment satisfaction reported by the TAICBT group. Given the prediction that treatment satisfaction and therapeutic alliance may impact symptom reduction, a longitudinal mixed-effects model was computed with treatment satisfaction and therapeutic alliance as predictor variables, and the score on the
EPDS was set as the dependent variable. Descriptive data on treatment expectancy reported by the TAICBT group will also be presented.

**Qualitative data analysis.** The 10 open-ended survey questions were investigated using inductive content analysis (Smith, 2000). This method was selected as there are no previous studies focusing on women’s perceptions of TAICBT for PPD, and therefore, the coded categories are derived directly from the text data (Hsieh & Shannon, 2005). Further, inductive content analysis is appropriate given the open-ended questions were exploratory in nature and, unlike other analytic methods, inductive content analysis is not theoretically bound, but rather conceptual ideas emerge from the data (Smith, 2000). The process of inductive content analysis was conducted according to Elo and Kyngas’s (2008)’s recommendations involving identifying, analyzing, and reporting patterns and themes within the data. The goal of data preparation was to become immersed in the data, obtain the sense of whole, and select the unit of analysis. Organizing the data followed which included open coding to express the data in the form of general concepts. More specifically, line-by-line analysis was used for open coding, which involved phrase-by-phrase examination of data. Lists of categories were then grouped under higher order headings to collapse similar or dissimilar categories. This process of analysis enabled me to generate a core theme, categories, and sub-categories through further sampling. Reporting the findings through the description of categories and themes followed.

To enhance the rigour of the qualitative analysis and to ensure my personal experiences did not influence data analysis and interpretation of the results, in addition to me, another graduate student from the Clinical Psychology Program at the University of Regina who has experience with content analysis was hired to qualitatively analyze the
responses. Intercoder reliability was utilized to ensure the interpretations of the data were considered valid (Neuendorf, 2002). During the coding process, the two researchers compared and contrasted their thematic findings and generated a summary of common themes. The common themes that were generated were discussed in detail and related back to the objective of the interview, which was to generate a comprehensive understanding of the clients’ experience with Maternal Depression Online.

Not all of the clients’ responses were included in the qualitative analyses. A data saturation technique was utilized whereby client responses were continually analyzed until the data set was complete, as indicated by data replication or redundancy (Bowen, 2008). Specifically, when clients were no longer contributing new insight, no new themes are identified, and no issues emerged regarding a category of data, saturation would be reached (Strauss & Corbin, 1998). As stated by Morse, Barnett, Mayan, Olson, and Spiers (2002), the objective is to ensure “efficient and effective saturation of categories, with optimal quality data and minimal dross” (p. 12).

Preparation of the Data for Analysis

Prior to conducting the analyses, the data set was cleaned and screened for accuracy. Assessment for outliers was conducted by examining the z-scores for each dependent and independent variable. Based on the recommended criteria that z-scores greater than 3.29 should be considered outliers (Tabachnick & Fidell, 2001), one case was identified as an outlier for the majority of measures (ID 21). This participant was allocated into the treatment condition and terminated the program at Module 4 as she was hospitalized for severe depression. Despite termination, the participant agreed to complete the post-treatment outcome measures once released from the hospital. Given the
severity of her symptoms, this participant’s responses to the questionnaires were outliers.

To address this outlying case, all analyses were computed twice: (a) with the outlying case, and (b) without the outlying case. Normality, linearity, and homoscedasticity were examined via histograms and scatterplots, and no substantial deviations were noted.
CHAPTER FIVE: RESULTS

Preliminary Analyses

Means and standard deviations for each dependent variable, at each time of measurement, for each group are reported in Table 4. Correlations among measures at pre-treatment were assessed (see Table 5) and indicated that many of the questionnaires were significantly related to one another. Specifically, the EPDS was found to strongly correlate with the three DASS subscales (i.e., anxiety, depression, stress), suggesting that those participants with elevated PPD symptoms were more inclined to have elevated general depression, anxiety, and stress. The EPDS and the DASS-Depression subscale were also moderately correlated with the PSI-Parental Distress subscale. This indicates that participants with greater symptoms of depression were more likely to report distress related to parenting. Finally, the EPDS was negatively correlated with the WHO subscales, suggesting that elevated symptoms of PPD were related to lower quality of life.
### Means and Standard Deviations for Primary and Secondary Outcome Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>TAICBT N</th>
<th>Mean</th>
<th>SD</th>
<th>TAICBT SD</th>
<th>WLC N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>25</td>
<td>15.68</td>
<td>4.23</td>
<td></td>
<td>25</td>
<td>16.24</td>
<td>3.54</td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>25</td>
<td>14.92</td>
<td>4.32</td>
<td></td>
<td>24</td>
<td>15.13</td>
<td>4.06</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>8.68</td>
<td>3.80</td>
<td></td>
<td>21</td>
<td>12.71</td>
<td>3.70</td>
</tr>
<tr>
<td>Follow-up</td>
<td>15</td>
<td>5.60</td>
<td>2.35</td>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>DASS-Depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>25</td>
<td>15.2</td>
<td>7.14</td>
<td></td>
<td>23</td>
<td>15.39</td>
<td>9.07</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>5.05</td>
<td>5.67</td>
<td></td>
<td>21</td>
<td>11.52</td>
<td>8.39</td>
</tr>
<tr>
<td>DASS-Anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>25</td>
<td>13.04</td>
<td>8.49</td>
<td></td>
<td>23</td>
<td>9.04</td>
<td>8.22</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>6.10</td>
<td>6.16</td>
<td></td>
<td>21</td>
<td>7.62</td>
<td>6.74</td>
</tr>
<tr>
<td>DASS-Stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>24</td>
<td>19.13</td>
<td>7.37</td>
<td></td>
<td>23</td>
<td>17.39</td>
<td>7.44</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>12.32</td>
<td>6.26</td>
<td></td>
<td>21</td>
<td>18.19</td>
<td>5.79</td>
</tr>
<tr>
<td>PSI-CDI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>25</td>
<td>21.36</td>
<td>7.41</td>
<td></td>
<td>22</td>
<td>21.55</td>
<td>7.51</td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>19</td>
<td>18.58</td>
<td>5.98</td>
<td></td>
<td>20</td>
<td>22.20</td>
<td>6.73</td>
</tr>
<tr>
<td>PSI-PD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>24</td>
<td>40.92</td>
<td>5.39</td>
<td></td>
<td>22</td>
<td>38.22</td>
<td>8.94</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>31.79</td>
<td>8.93</td>
<td></td>
<td>20</td>
<td>36.40</td>
<td>7.49</td>
</tr>
<tr>
<td>PSI-DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>23</td>
<td>29.70</td>
<td>8.93</td>
<td></td>
<td>22</td>
<td>28.23</td>
<td>9.13</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>26.26</td>
<td>6.89</td>
<td></td>
<td>20</td>
<td>28.80</td>
<td>8.82</td>
</tr>
<tr>
<td>WHO-QOL-D1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>25</td>
<td>3.20</td>
<td>0.50</td>
<td></td>
<td>25</td>
<td>3.30</td>
<td>0.74</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>4.43</td>
<td>3.27</td>
<td></td>
<td>20</td>
<td>3.06</td>
<td>0.76</td>
</tr>
<tr>
<td>WHO-QOL-D2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>25</td>
<td>2.76</td>
<td>0.50</td>
<td></td>
<td>25</td>
<td>2.74</td>
<td>0.78</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>4.67</td>
<td>2.92</td>
<td></td>
<td>20</td>
<td>2.61</td>
<td>0.95</td>
</tr>
<tr>
<td>WHO-QOL-D3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>25</td>
<td>2.67</td>
<td>0.74</td>
<td></td>
<td>25</td>
<td>2.97</td>
<td>1.15</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>4.33</td>
<td>2.58</td>
<td></td>
<td>20</td>
<td>2.71</td>
<td>1.49</td>
</tr>
<tr>
<td>WHO-QOL-4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>25</td>
<td>3.49</td>
<td>0.54</td>
<td></td>
<td>25</td>
<td>3.50</td>
<td>1.15</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>19</td>
<td>4.63</td>
<td>3.01</td>
<td></td>
<td>20</td>
<td>3.09</td>
<td>1.63</td>
</tr>
</tbody>
</table>

*Note.* TAICBT = Therapist Assisted Internet Cognitive Behaviour Therapy; WLC = Waitlist Control; EPDS = Edinburgh Postnatal Depression Scale; DASS = Depression Anxiety Stress; PSI-CDI = Parenting Stress Index-Parent-Child Dysfunctional Interaction; PSI-PD = Parenting Stress Index-Parental Distress; PSI-DC = Parenting Stress Index-Difficult Child; WHO-QOL = World Health Organization Quality of Life-BREF; WHO-QOL-1 = Domain 1, Physical Health; WHO-QOL-2 = Domain 2, Psychological Health; WHO-QOL-3 = Domain 3, Social Relationships; WHO-QOL-4 = Domain 4, Environmental.
### Table 5

**Correlations among Measures at Pre-Treatment**

<table>
<thead>
<tr>
<th></th>
<th>EPDS</th>
<th>DASS-S</th>
<th>DASS-A</th>
<th>DASS-D</th>
<th>PSI-PD</th>
<th>PSI-CIDI</th>
<th>PSI-DC</th>
<th>WHO-DI</th>
<th>WHO-D2</th>
<th>WHO-D3</th>
<th>WHO-D4</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDS</td>
<td>---</td>
<td>.50**</td>
<td>.46**</td>
<td>.68**</td>
<td>.48**</td>
<td>-.03</td>
<td>.11</td>
<td>-.39**</td>
<td>-.44**</td>
<td>-.47**</td>
<td>-.72**</td>
</tr>
<tr>
<td>DASS-S</td>
<td>---</td>
<td>.55**</td>
<td>.39**</td>
<td>.05</td>
<td>-.10</td>
<td>.12</td>
<td>-.34*</td>
<td>-.25</td>
<td>-.30*</td>
<td>-.32*</td>
<td></td>
</tr>
<tr>
<td>DASS-A</td>
<td>---</td>
<td>.41**</td>
<td>.06</td>
<td>.07</td>
<td>-.01</td>
<td>-.09</td>
<td>-.12</td>
<td>-.21</td>
<td>-.35*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DASS-D</td>
<td>---</td>
<td>.59**</td>
<td>.16</td>
<td>.29</td>
<td>-.21</td>
<td>-.57**</td>
<td>-.15</td>
<td>-.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSI-PD</td>
<td>---</td>
<td>.28</td>
<td>.44**</td>
<td>-.31*</td>
<td>-.62**</td>
<td>-.39**</td>
<td>-.31*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSI-CIDI</td>
<td>---</td>
<td>.39**</td>
<td>-.15</td>
<td>-.29*</td>
<td>.05</td>
<td>-.30*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSI-DC</td>
<td>---</td>
<td>-.29*</td>
<td>-.09</td>
<td>-.09</td>
<td>-.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHO-DI</td>
<td>---</td>
<td>.53**</td>
<td>.48</td>
<td>.62**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHO-D2</td>
<td>---</td>
<td>.45**</td>
<td>.58**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHO-D3</td>
<td>---</td>
<td>.60**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHO-D4</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. EPDS = Edinburgh Postnatal Depression Scale; DASS = Depression Anxiety Stress; PSI-CIDI = Parenting Stress Index-Parent-Child Dysfunctional Interaction; PSI-PD = Parenting Stress Index-Parental Distress; PSI-DC = Parenting Stress Index-Difficult Child; WHO = World Health Organization Quality of Life-BREF; WHO-1 = Domain 1, Physical Health; WHO-2 = Domain 2, Psychological Health; WHO-3 = Domain 3, Social Relationships; WHO-4 = Domain 4, Environmental. *p < .05, **p < .01
Treatment Received Reported by WLC Group

As presented in Table 6, WLC participants received a variety of treatment during the wait period. More specifically, close to 58% received treatment from a medical doctor, 32% sought treatment that was directly related to maternal depression, while

Program Engagement and Attrition

The descriptive statistics for program utilization of the TAICBT participants are presented in Table 7. As can be seen, TAICBT participants completed on average 5.92 of the seven modules (60% of the participants completed all of the seven modules, while 20% completed less than half of the modules). The website was extensively used by participants as indicated by the mean number of program visits, the number of emails sent by the client, and the emails received by the client from the therapist.

At the 7 to 10 week follow-up, the battery of post-treatment questionnaires was completed by 21 of the 25 participants (84%) in the TAICBT group and 21 of the 25 (84%) in the WLC group. There were no differences between completers and non-completers on the baseline EPDS: $t(48) = -1.87, p = .067$, or treatment group: $\chi^2(1) = .50, p = .48$. At the four-week post-treatment follow-up (i.e., approximately 14 weeks following pre-treatment), 14 of the 25 (56%) participants in the TAICBT group completed the third battery of questionnaires. For ethical reasons, the WLC group was not administered the four-week post-treatment questionnaires as many were offered and engaged in TAICBT; therefore, a statistical comparison between the groups could not be computed.
Table 6

*Treatment Received by the Waitlist Control Group during Wait Period (n = 21)*

<table>
<thead>
<tr>
<th>Type of treatment</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical doctor</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12 (57)</td>
</tr>
<tr>
<td>No</td>
<td>9 (43)</td>
</tr>
<tr>
<td>Number of treatments</td>
<td></td>
</tr>
<tr>
<td>1 (46)</td>
<td></td>
</tr>
<tr>
<td>2 (32)</td>
<td></td>
</tr>
<tr>
<td>Psychotropic Medication</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6 (29)</td>
</tr>
<tr>
<td>No</td>
<td>15 (71)</td>
</tr>
<tr>
<td>Treatment related to maternal depression</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6 (32)</td>
</tr>
<tr>
<td>No</td>
<td>15 (71)</td>
</tr>
<tr>
<td>Psychological treatment</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (37)</td>
</tr>
<tr>
<td>No</td>
<td>12 (63)</td>
</tr>
<tr>
<td>Support group</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7 (37)</td>
</tr>
<tr>
<td>No</td>
<td>13 (63)</td>
</tr>
</tbody>
</table>

*Note. % rounded to the nearest whole value*
Table 7

*Program Utilization by TAICBT Participants (N = 24)*

<table>
<thead>
<tr>
<th></th>
<th>M (SD)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of days of program access</td>
<td>69.04 (30.10)</td>
<td>8</td>
<td>129</td>
</tr>
<tr>
<td>Number of program visits</td>
<td>26.88 (11.63)</td>
<td>7</td>
<td>56</td>
</tr>
<tr>
<td>Number of modules completed</td>
<td>5.92 (1.52)</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Emails sent from client</td>
<td>5.4 (4.15)</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Emails sent from therapist</td>
<td>10.52 (3.95)</td>
<td>3</td>
<td>20</td>
</tr>
</tbody>
</table>
Testing Hypothesis 1

Hypothesis one investigated whether participants who received TAICBT would demonstrate greater symptom improvement from pre- to post-treatment than waitlist control participants on all primary and secondary symptom measure. Given that the EPDS was administered to both groups at three time points (i.e., baseline, pre-treatment, post-treatment), longitudinal mixed-model analyses (Gelman & Hill, 2007; Singer & Willett, 2003) were computed on the EPDS total and EPDS subscales (i.e., EPDS-depression and EPDS-anxiety). Multiple regression analyses were computed for all secondary measures, as they were administered at two time points.

**Mixed-model analysis for the EPDS measure.** A longitudinal mixed model (i.e., multilevel model) was fit for the trajectories of clients’ EPDS total score over time, as measured in weeks. Given that clients generally tend to improve with respect to depression over time, regardless of treatment intervention, the week variable was hypothesized to have a negative coefficient and a one-tailed test was performed. As presented in Table 8, compared to the WLC group, the TAICBT group exhibited significantly different trajectories or change over time as demonstrated by the significant negative coefficient for the Week*Treatment interaction term, \( F(1, 11.82) = 5.15, p = .02 \). Lattice plots of each participant’s trajectory of scores on the EPDS over time are presented in Appendix R. Collectively, the results suggested that symptoms of PPD tended to decrease more quickly over the weeks for participants in the TAICBT group compared to those in the WLC group.
Table 8

Multilevel Models for Week and Treatment on EPDS Total and Subscale Scores

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Df</th>
<th>t</th>
<th>p</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1: EPDS- Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>15.66</td>
<td>.658</td>
<td>49.22</td>
<td>23.821</td>
<td>0.00</td>
<td>14.34</td>
<td>16.98</td>
</tr>
<tr>
<td>Week</td>
<td>-.26</td>
<td>.0634</td>
<td>20.89</td>
<td>-4.042</td>
<td>0.0003</td>
<td>-.39</td>
<td>-.124</td>
</tr>
<tr>
<td>Tx</td>
<td>.54</td>
<td>.906</td>
<td>48.07</td>
<td>.592</td>
<td>.557</td>
<td>-1.29</td>
<td>2.36</td>
</tr>
<tr>
<td>Interaction (Week * Tx)</td>
<td>-.175</td>
<td>.077</td>
<td>11.77</td>
<td>-2.272</td>
<td>0.02</td>
<td>-.34</td>
<td>-.007</td>
</tr>
<tr>
<td><strong>Model 2: EPDS- Depression</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>4.36</td>
<td>.387</td>
<td>.001</td>
<td>11.262</td>
<td>.993</td>
<td>-74261.17</td>
<td>74269.90</td>
</tr>
<tr>
<td>Week</td>
<td>-.122</td>
<td>.0354</td>
<td>.007</td>
<td>-3.43</td>
<td>.484</td>
<td>-5396.25</td>
<td>5396.01</td>
</tr>
<tr>
<td>Tx</td>
<td>.189</td>
<td>.535</td>
<td>.000</td>
<td>.353</td>
<td>.999</td>
<td>-111030.36</td>
<td>111030.74</td>
</tr>
<tr>
<td>Interaction (Week * Tx)</td>
<td>-.073</td>
<td>.0485</td>
<td>.023</td>
<td>-1.506</td>
<td>.467</td>
<td>-8075.019</td>
<td>8074.872</td>
</tr>
<tr>
<td><strong>Model 3: EPDS- Anxiety</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>6.07</td>
<td>.262</td>
<td>48.99</td>
<td>23.14</td>
<td>.000</td>
<td>5.546</td>
<td>6.000</td>
</tr>
<tr>
<td>Week</td>
<td>-.034</td>
<td>.039</td>
<td>41.13</td>
<td>-.876</td>
<td>.193</td>
<td>-.113</td>
<td>.045</td>
</tr>
<tr>
<td>Tx</td>
<td>.555</td>
<td>.362</td>
<td>48.04</td>
<td>1.53</td>
<td>.132</td>
<td>-.172</td>
<td>1.28</td>
</tr>
<tr>
<td>Interaction (Week * Tx)</td>
<td>-.124</td>
<td>.053</td>
<td>36.78</td>
<td>-2.32</td>
<td>.013</td>
<td>-.232</td>
<td>-.0159</td>
</tr>
</tbody>
</table>

*Note. Dependent variable = EPDS Baseline; Week = time measured in weeks; Df = degrees of freedom; Tx = treatment, 0 for WLC and 1 for TAICBT; p values for week and interaction are 1-tailed.*
Over 10 weeks, the model indicated that clients in the TAICBT condition tended to reduce in EPDS total score by 1.75 points compared to those in the WLC group, based on the decrease of 0.175 points/week. According to Affonso, De, Horowitz, and Mayberry (2000), a change in 1 point on the EDPS suggests a small effect, a change in 2-3 points suggests a medium effect, while a change of 4 points or more suggests a large effect. Therefore, the 1.75 point change in EPDS total score approaches a medium effect size. The overall change for the TAICBT group over 10 weeks, including the effect of time (i.e., the week variable), would tend to decrease by 4.31 points. A 4.31 point change in EPDS total score would be considered a large effect size (Affonso et al., 2000).

The model intercept indicates an average starting point for EPDS total score for the WLC group. The treatment variable is an adjustment for the treatment group to this average starting point. Not surprisingly, the treatment variable (i.e., the starting point adjustment) was not significant because the clients were randomly assigned to the treatment and control group, which then resulted in the two groups having a similar average starting point.

Participant with ID 21 was considered to have a severe case of depression. This case was subsequently found to be an outlier in some of the regressions. A binary indicator variable was created, which had the value 1 for this case and 0 otherwise. The longitudinal mixed model was refit including this variable. As expected, this variable was statistically significant because the case with ID 21 was an outlier. However, results indicated that the other variables’ coefficients and p-values did not change in any substantial or essential manner. The original longitudinal mixed model was, therefore, not unduly affected by this outlier (see Appendix S).
Mixed-model analysis for EPDS subscales. Longitudinal mixed models (i.e., multilevel model) were fitted for the trajectories of clients’ EPDS-Anxiety and Depression subscale scores over time, as measured in weeks. Results revealed significant interaction effects of treatment and time, indicating a difference between groups: $F(1, 36.78) = 5.40, p = .013$ for the EPDS-Anxiety subscale. This finding suggests that the TAICBT condition tended to reduce in EPDS-Anxiety by 1.24 points compared to those in the WLC group, based on the decrease of 0.124 points/week. The mixed-model analysis failed to reveal significant interaction effects of treatment and time with respect to the EPDS-Depression subscale: $F(1, .023) = 2.27, p = .467$.

Multiple regression analyses of secondary outcome measures. Hypothesis one also stated that participants who received TAICBT would demonstrate greater symptom improvement from pre- to post-treatment than participants in the WLC condition on all secondary outcome measures. In order to test this hypothesis, multiple regressions were conducted on each of the secondary outcome measures (i.e., DASS-Stress, DASS-Anxiety, DASS-Depression, PSI-Total, PSI-Parental Distress; PSI-Parent-Child Dysfunction; PSI-Difficult Child; and WHO-QOL-Physical Health, Psychological Health, Social, and Environmental). The independent variables included time (i.e., measured in weeks), treatment group (i.e., 1 for TAICBT or 0 for WLC), and the first assessment of the outcome measure of interest. Prior to conducting the regressions, data were examined for multicollinearity between the predictors. Multicollinearity was not

---

11 Multiple regression analyses were conducted instead of repeated measures ANOVAs for a few reasons. First, repeated measures ANOVAs require a complete data set which was not available. With multiple regression analyses, multiple imputation was used to complete the data set. Second, given that repeated measures focuses primarily on change scores (i.e., change from baseline to post-treatment), multiple regressions allows for more accuracy and the original value is taken into consideration.

12 The first assessment of the outcome measure of interest was included in each multiple regression analysis to control for the passage of time.
present, as there were no substantial correlations in the data (Field, 2010). Further, examination of the data also indicated that the assumptions of both linearity and homoscedasticity were met. Only regressions with an alpha of less than .01 were interpreted to correct for multiple comparisons and to prevent committing a Type 1 error (Streiner, 2008).

As presented in Table 9, the multiple regression model investigating DASS-Stress at Time 2 was statically significant: $F(3, 38) = 4.23, p = .01, R^2 = .25$ (adjusted $R^2 = .19$). The variables accounted for 25% of the variance. The treatment group ($B = -5.720, \beta = -.41$) was the only statistically significant predictor of DASS-Stress at Time 2, while time and DASS-Stress at Time 1 failed to reach statistical significance in the regression model. This result confirmed the hypothesis and suggests that treatment group (i.e., TAICBT or WLC) was a statically significant predictor of stress at post-treatment, while the passage of time and stress at pre-treatment were not predictors. The multiple regression model for DASS-Anxiety at Time 2 was also statistically significant: $F(3, 33) = 9.23, p < .001, R^2 = .46$ (adjusted $R^2 = .41$), suggesting that the independent variables accounted for 46% of the variance. DASS-Anxiety at Time 1 ($B = 0.59, \beta = .56$) was the only predictor of DASS-Anxiety at Time 2, while the treatment group and time variables failed to reach statistical significance in the regression model (see Table 9 presented at the end of this section). This result did not confirm the hypothesis, as it indicated that treatment group or time were not predictors of anxiety at post-treatment. In terms of DASS-Depression at Time 2, the multiple regression model was statistically significant: $F(3, 38) = 6.16, p = .002, R^2 = .33$ (adjusted $R^2 = .27$), with the variables accounting for 33% of the variance. As seen in Table 9, DASS-Depression at Time 1 ($B = 0.54, \beta = .49$) was the only
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

predictor of DASS-Depression at Time 2. Group and time predictor variables failed to reach statistical significance in this regression model. This finding did not support the hypothesis, as it suggested that group or time were not significantly related to depressive symptoms at post-treatment.

Turning to parental stress, when considering total score on the Parental Stress Inventory at Time 2, the multiple regression model reached statistical significance: $F(3, 35) = 19.86, p < .001, R^2 = .63$ (adjusted $R^2 = .60$). Together, the variables in this model accounted for 63% of the variance. As evident in Table 9, only PSI total score at Time 1 was a statistically significant predictor ($B = 0.73, \beta = .75$), while the treatment group approached significance ($\beta = 4.46, p = .028$). Upon closer examination of the Parental Stress Inventory, the multiple regression model for the Parental Distress Subscale at Time 2 was also statistically significant: $F(3, 37) = 16.24, p < .001, R^2 = .57$ (adjusted $R^2 = .53$). The treatment group ($B = -6.46, \beta = -.41$) and PSIPD at Time 1 ($B = 0.77, \beta = .72$) were significant predictors, while time failed to reach statistical significance in the regression model. Turning to the Child Dysfunctional Interaction Subscale at Time 2, the multiple regression model was statistically significant: $F(3, 37) = 10.55, p < .001, R^2 = .46$ (adjusted $R^2 = .42$), with the variables accounting for 46% of the variance. The Child Dysfunctional Interaction Subscale at Time 1 ($B = 0.56, \beta = .62$) was a statistically significant predictor of Child Dysfunctional Interaction Subscale at Time 2, while treatment group and time failed to reach statistical significance in the model. The multiple regression model for the Difficult Child Subscale at Time 2 was statistically significant: $F(3, 35) = 14.15, p < .001, R^2 = .55$ (adjusted $R^2 = .51$). The variables accounted for 55% of the variance in this model. PSIPD at Time 1 ($B = 0.77, \beta = .72$)
was a significant predictor, while time and treatment group failed to reach statistical
significance in the regression model. Collectively, the findings from these multiple
regression analyses partially support the hypothesis and indicated that parental distress at
post-treatment were predicted significantly by treatment group.

With respect the World Health Organization Quality of Life measure, the
regression model for the first domain focusing on physical health was statically
significant, $F(3, 37) = 5.25, p < .01, R^2 = .30$ (adjusted $R^2 = .24$). As presented in Table 9,
only Time 1 of the first domain ($B = 0.32, \beta = .39$) was a statistically significant predictor
in this model. Time approached statistical significance ($B = .029, \beta = .23, p = .022$), while
the treatment group failed to reach statistical significance in this model (i.e., treatment
group and time). Turning to the second domain of quality of life—psychological
health—the regression model was statistically significant: $F(3, 36) = 8.79, p < .001, R^2 =
.49$ (adjusted $R^2 = .45$). Psychological health at Time 1 ($B = 0.72, \beta = .61$) was a
statistically significant predictor in this model, while the treatment group approached
statistical significance ($B = 0.42, \beta = .34, p = .014$). The multiple regression for the third
domain of quality of life focusing on social relationships was statically significant: $F(3,
37) = 6.57, p < .001, R^2 = .35$ (adjusted $R^2 = .30$). As seen in Table 9, only social
relationships at Time 1 ($B = 0.57, \beta = .65$) was a statistically significant predictor in the
model. The multiple regression model for the fourth domain that focused on
environmental quality of life was statistically significant: $F(3, 37) = 17.63, p < .001, R^2 =
.59$ (adjusted $R^2 = .56$). Environmental quality of life at Time 1 ($B = .79, \beta = .79$) was a
statistically significant predictor in this model, while the treatment group ($B = 0.33, \beta =
.31, p = .011$) and time ($B = -.04, \beta = -.25, p = .028$) were variables that approached
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

statistical significance. Collectively, the findings from these multiple regression analyses partially supported the hypothesis and indicated that psychological health and environmental quality of life at post-treatment were predicted significantly by treatment group.

Given that one participant was identified as an outlier, all regression analyses were re-computed with the addition of this case included as an indicator variable. The inclusion of this variable did not significantly impact the results aside from one exception. Specifically, the results of the multiple regression used to predict DASS-Depression with the independent variables including time (i.e., measured in weeks), treatment group (i.e., TAICBT or WLC), and the first assessment of the outcome measure of interest were influenced when the outlying case 21 was included in the model. This multiple regression model was statistically significant: $F(4, 37) = 8.56, p < .001, R^2 = .48$ (adjusted $R^2 = .42$), with the variables accounting for 48% of the variance. When the outlying case was included, DASS-Depression at Time 1 was a predictor of DASS-Depression at Time 2, and (unique to this model) the treatment group was a statistically significant predictor ($B = 0.54, \beta = .31, p = .018$). This result suggested that through controlling for the outlying case, the treatment group became more of a significant variable in the model.

Multiple regression analyses with accounted missing data. Given that 16% of the data were missing, all regression analyses were redone with the missing data accounted for using the multiple imputation method (Fox, 2008). A comparison of the

---

13 Participants who did not complete the Time 2 measures were considered missing cases. Forty-two of the 50 participants completed Time 2 measures, therefore, eight participants’ Time 2 data were considered missing. Given that the missing data were not necessarily a result of the presenting symptomatology, the data were considered missing completely at random for both groups (Rubin, 1976).
results from the original data set to the pooled results from the five imputed data sets indicated only one essential change in the results, suggesting that the missing data did not significantly impact the overall results. Similar to the original data set, the multiple regression on the five pooled data sets predicting the DASS-Depression Subscale was statistically significant; however, unique to the pooled data set, the treatment group variable approached statistical significance in the regression model (B = -4.40, p = .025).\[^{14}\] This result indicated that the missing data may have impacted the regression model predicting the DASS-Depression Subscale. Therefore, in accordance with the hypothesis, this result suggested that treatment group was a significant predictor of depressive symptoms at post-treatment.

\[^{14}\] A standardized beta is not provided for the pooled multiple regression results.
Table 9

Regression Analyses of Secondary Outcome Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASS-Stress Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>12.97</td>
<td>4.01</td>
<td></td>
<td>.001</td>
</tr>
<tr>
<td>Time</td>
<td>-.06</td>
<td>.34</td>
<td>-.03</td>
<td>.434</td>
</tr>
<tr>
<td>Group</td>
<td>-5.72</td>
<td>2.36</td>
<td>-.41*</td>
<td>.010</td>
</tr>
<tr>
<td>DASS-Stress T1</td>
<td>.28</td>
<td>.13</td>
<td>.31*</td>
<td>.016</td>
</tr>
<tr>
<td>DASS-Anxiety Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.35</td>
<td>2.74</td>
<td></td>
<td>.03</td>
</tr>
<tr>
<td>Time</td>
<td>-.30</td>
<td>.28</td>
<td>-.17</td>
<td>.144</td>
</tr>
<tr>
<td>Group</td>
<td>-2.64</td>
<td>2.0</td>
<td>-.20</td>
<td>.098</td>
</tr>
<tr>
<td>DASS-Anx T1</td>
<td>.59</td>
<td>.12</td>
<td>.65**</td>
<td>.0001</td>
</tr>
<tr>
<td>DASS-Depression Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>4.19</td>
<td>4.1</td>
<td></td>
<td>.314</td>
</tr>
<tr>
<td>Time</td>
<td>-.08</td>
<td>.38</td>
<td>-.03</td>
<td>.417</td>
</tr>
<tr>
<td>Group</td>
<td>-4.27</td>
<td>2.7</td>
<td>-.25</td>
<td>.123</td>
</tr>
<tr>
<td>DASS-Dep T1</td>
<td>.54</td>
<td>.15</td>
<td>.49**</td>
<td>.001</td>
</tr>
<tr>
<td>PSI-Total Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>23.00</td>
<td>11.91</td>
<td></td>
<td>.062</td>
</tr>
<tr>
<td>Time</td>
<td>-.16</td>
<td>.63</td>
<td>-.03</td>
<td>.401</td>
</tr>
<tr>
<td>Group</td>
<td>-8.85</td>
<td>4.46</td>
<td>-.25</td>
<td>.055</td>
</tr>
<tr>
<td>PSI-Tot T1</td>
<td>.73</td>
<td>.10</td>
<td>.75**</td>
<td>.000</td>
</tr>
<tr>
<td>PSI-PD Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>7.72</td>
<td>5.53</td>
<td></td>
<td>.171</td>
</tr>
<tr>
<td>Time</td>
<td>-.03</td>
<td>.30</td>
<td>-.002</td>
<td>.456</td>
</tr>
<tr>
<td>Group</td>
<td>-6.46</td>
<td>2.11</td>
<td>-.41**</td>
<td>.004</td>
</tr>
<tr>
<td>PSI-PD T1</td>
<td>.77</td>
<td>.12</td>
<td>.72**</td>
<td>.000</td>
</tr>
<tr>
<td>PSI-CDI Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>11.55</td>
<td>3.75</td>
<td></td>
<td>.004</td>
</tr>
<tr>
<td>Time</td>
<td>-.28</td>
<td>.27</td>
<td>-.15</td>
<td>.151</td>
</tr>
<tr>
<td>Group</td>
<td>.61</td>
<td>-1.84</td>
<td>-.05</td>
<td>.742</td>
</tr>
<tr>
<td>PSI-CDI T1</td>
<td>.56</td>
<td>.11</td>
<td>.62**</td>
<td>.000</td>
</tr>
<tr>
<td>PSI-DC Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>7.83</td>
<td>4.77</td>
<td></td>
<td>.107</td>
</tr>
<tr>
<td>Time</td>
<td>.14</td>
<td>.32</td>
<td>.06</td>
<td>.332</td>
</tr>
<tr>
<td>Group</td>
<td>-3.09</td>
<td>2.2</td>
<td>-.19</td>
<td>.170</td>
</tr>
<tr>
<td>PSI-DC T1</td>
<td>.67</td>
<td>.11</td>
<td>.74**</td>
<td>.000</td>
</tr>
<tr>
<td>Variable</td>
<td>$B$</td>
<td>$SE_B$</td>
<td>$\beta$</td>
<td>$p$</td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>--------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td><strong>WHO-D1 Time 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>2.06</td>
<td>.42</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>.03</td>
<td>.02</td>
<td>.044</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>.22</td>
<td>.15</td>
<td>.152</td>
<td></td>
</tr>
<tr>
<td>WHO-D1 T1</td>
<td>.32</td>
<td>.13</td>
<td>.008</td>
<td></td>
</tr>
<tr>
<td><strong>WHO-D2 Time 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>.62</td>
<td>.46</td>
<td>.179</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>.03</td>
<td>.03</td>
<td>.117</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>.42</td>
<td>.18</td>
<td>.028</td>
<td></td>
</tr>
<tr>
<td>WHO-D2 T1</td>
<td>.72</td>
<td>.15</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td><strong>WHO-D3 Time 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.62</td>
<td>.47</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>-.02</td>
<td>.03</td>
<td>.297</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>.32</td>
<td>.23</td>
<td>.182</td>
<td></td>
</tr>
<tr>
<td>WHO-D3 T1</td>
<td>.57</td>
<td>.13</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td><strong>WHO-D4 Time 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1.13</td>
<td>.42</td>
<td>.012</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>-.04</td>
<td>.02</td>
<td>.028</td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>.33</td>
<td>.14</td>
<td>.021</td>
<td></td>
</tr>
<tr>
<td>WHO-D4 T1</td>
<td>.79</td>
<td>.11</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

Note. DASS = Depression Anxiety Stress; PSI-CDI = Parenting Stress Index-Parent-Child Dysfunctional Interaction; PSI-PD = Parenting Stress Index-Parental Distress; PSI-DC = Parenting Stress Index-Difficult Child; WHO-QOL = World Health Organization Quality of Life-BREF; WHO-QOL-1 = Domain 1, Physical Health; WHO-QOL-2 = Domain 2, Psychological Health; WHO-QOL-3 = Domain 3, Social Relationships; WHO-QOL-4 = Domain 4, Environmental; T1 = Time 1; Time = weeks between completing pre-treatment and post-treatment measures; Treatment = treatment group.

$p$ values for the time and treatment variables are one tailed.
Figure 2. Proportion of participants in each treatment condition who demonstrated different classifications of clinically significant change, according to Jacobson and Truax’s (1991) definition, on the EPDS. (TAICBT = Therapist Assisted Internet Cognitive Behaviour Therapy; WLC = Waitlist Control Group). Original in Colour.
Testing Hypothesis 2

Hypothesis two aimed to further assess the efficacy of TAICBT by examining whether the changes were reliable and clinically significant for patients who completed the follow-up EPDS. This concept has been defined by Jacobson and Truax (1991) as “the extent to which therapy moves someone outside the range of the dysfunctional population or within the range of the functional population” (p. 12). The two-step Jacobson and Truax method was computed. For participants in the TAICBT group, 68% demonstrated reliable change while only 57% of participants in the WLC condition demonstrated reliable change (i.e., change in pre- to post-score was greater than 4 points; see also Matthey, 2004). Chi-square analysis using Fisher’s Exact Test showed an association that approached statistical significance between the treatment condition and the WLC condition and the occurrence of reliable change: $\chi^2(1) = 2.93, p = .08$. With respect to effect size regarding reliable change, using the Cramer’s V statistic, a small effect size of .28 was revealed between the TAICBT and WLC conditions.

As presented in Figure 2, when considering the classification of change for the 21 participants in the WLC group, 11 women demonstrated no reliable change, two women reliably deteriorated, three had improved but not recovered, and five were considered recovered. In contrast, when considering the classification of change for the 21 participants in the TAICBT group, no participants deteriorated, four participants did not demonstrate reliable change, four had improved but not recovered, and 13 were considered recovered.
**Testing Hypothesis 3**

As the WLC condition was provided access to the Maternal Depression Online (MDO) program after completion of the Time 2 measures and did not complete additional measures for this study, a between-subjects examination of effects was not possible for the four-week follow-up. Therefore, a within-subjects analysis was conducted comparing follow-up EPDS scores to post-treatment scores. Descriptive statistics on the EPDS are presented in Table 4. The EPDS collected at the four-week follow-up had significant and large gains compared with the post-treatment scores: \( t(14) = 4.13, p = .0001 \). This result suggested that the participants in the TAICBT group not only maintained their gains at follow-up, but also significantly improved their symptom reduction.

**Testing Hypotheses 4 and 5**

The fourth hypothesis investigated satisfaction with MDO reported by the TAICBT Group. The means and standard deviations for the Treatment Satisfaction Questionnaire-Modified (TSQ; Cox et al., 1994) are presented in Table 10. On average, participants reported excellent ratings regarding how useful they found the program modules (Part A: \( M = 52.43/70 = 74.90\% \); \( SD = 15.34 \)) and how much they liked the modules (Part B: \( M = 60.63/84 = 72.18\% \); \( SD = 18.53 \)). Ratings for perceived level of improvement on depressive symptoms and perceived level of improvement on lifestyle factors were also good with participants, on average, providing ratings of 79.83\% (Part C: \( M = 27.94/35; SD = 5.81 \)) and 70.31\% (Part D: \( M = 24.61/35; SD = 7.20 \)) respectively. Satisfaction with the overall program was excellent, with 80% of the participants reporting that they liked the overall program (Question E1: \( M = 5.5/7; SD = \))
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

1.75), while 82% of participants reported enjoying communicating with their online therapist (Question E2: $M = 5.71/7 = 81.57\%; SD = 1.74$). Regarding therapist alliance, on average, participants reported a high level of therapeutic alliance, giving a rating of 86.42% ($M = 88.15/102; SD = 8.50$).

To further explore the relationship between treatment satisfaction and therapeutic alliance with symptoms of PPD, a longitudinal mixed model (i.e., multilevel model) was computed. The model was fit for the trajectories of clients’ EPDS total score over time (i.e., measured in weeks) with treatment satisfaction and therapeutic alliance entered as explanatory variables. One-tailed $t$-tests were performed because it was hypothesized that treatment satisfaction and therapeutic alliance would be positively related to a reduction in PPD symptoms. As evidenced in Table 11, interaction effects approached statistical significance for week and treatment satisfaction ($F(1, 6.63) = 3.74, p = .048$). This result indicated that participants who were satisfied with the treatment tended to decrease in PPD symptoms more quickly over the weeks. The interaction effects for week and therapeutic alliance was not statically significant: $F(1, 7.08) = 2.70, p = .072$.

With respect to treatment credibility, on average, participants who received TAICBT gave MDO a post-treatment credibility rating of 83.3% ($M = 22.5/27; SD = 4.62$), indicating that they held relatively positive attitudes towards the credibility of the treatment program. With respect to expectancy of the program, on average, participants gave MDO a rating of 73.6% ($M = 21.35/29; SD = 6.29$). This finding indicated that following the completion of the treatment program, the participants generally held high expectations that symptom improvement would be achieved.
Qualitative Analyses

An additional purpose of this research was to gather qualitative information regarding the participant’s experience with Maternal Depression Online. The goal of the 10 open-ended questions was to further understand participants’ perceptions of MDO and explore areas of the program that could be improved for future users. Two coders reviewed participant responses: (a) the principal investigator, N. Pugh, and (b) a graduate student independent of the research. Data saturation was reached after analyzing responses from the first 12 participants who completed the program. As presented in Figure 3, the theoretical construct that emerged from this analysis was *Maternal Depression Online: An Individualized Road to Wellbeing*. Categories emerged in relation to the nature of the questions and included: (a) positive experiences with the TAICBT program, (b) challenges with the TAICBT program, and (c) future directions of TAICBT programs. Within each category, distinct themes emerged, as summarized in Figure 3. Participant feedback that did not fit into categories or themes was considered action items to consider for the future.

---

15 A theoretical construct is an abstract concept that organizes a group of themes by fitting them into a theoretical framework (Auerbach & Silverstein, 2003).
Table 10

*Means and Standard Deviations for Treatment Satisfaction and Therapeutic Alliance*  

*Reported by the TAICBT Participants (n = 20)*

<table>
<thead>
<tr>
<th>Measure</th>
<th>M (SD)</th>
<th>T. Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSQ-Part A</td>
<td>55.39 (7.85)</td>
<td>70</td>
</tr>
<tr>
<td>TSQ-Part B</td>
<td>63.78 (10.35)</td>
<td>84</td>
</tr>
<tr>
<td>TSQ-Part C</td>
<td>27.94 (5.80)</td>
<td>35</td>
</tr>
<tr>
<td>TSQ-Part D</td>
<td>24.61 (7.20)</td>
<td>35</td>
</tr>
<tr>
<td>TAQ</td>
<td>88.15 (8.50)</td>
<td>102</td>
</tr>
</tbody>
</table>

*Note.* TSQ = Treatment Satisfaction Questionnaire-Modified; TSQ-Part A = Usefulness of the Program; TSQ-Part B = Personally Like the Program; TSQ-Part C = Perceived Improvement; TSQ-Part D = Perceived Life Changes; TAQ = Therapeutic Alliance Questionnaire; T. Max = Theoretical Maximum Score
Table 11

*Multilevel Model for Treatment Satisfaction and Therapeutic Alliance on EPDS Total Score*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Df</th>
<th>t</th>
<th>p</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EPDS-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regression coefficients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>28.72</td>
<td>5.67</td>
<td>5.03</td>
<td>5.26</td>
<td>.003</td>
<td>14.70</td>
<td>42.76</td>
</tr>
<tr>
<td>Week</td>
<td>-.62</td>
<td>.396</td>
<td>3.377</td>
<td>-1.572</td>
<td>.101</td>
<td>-1.806</td>
<td>.56</td>
</tr>
<tr>
<td>Tx satisfaction</td>
<td>.031</td>
<td>.023</td>
<td>18.56</td>
<td>1.33</td>
<td>.201</td>
<td>-.018</td>
<td>.079</td>
</tr>
<tr>
<td>Therapeutic Alliance</td>
<td>-.217</td>
<td>.071</td>
<td>6.59</td>
<td>-3.05</td>
<td>.02</td>
<td>-.388</td>
<td>-.047</td>
</tr>
<tr>
<td>Interaction (Week * Tx satisfaction)</td>
<td>-.0031</td>
<td>.0016</td>
<td>6.63</td>
<td>-1.93</td>
<td>.048</td>
<td>-.007</td>
<td>.0007</td>
</tr>
<tr>
<td>Interaction (Week * Therapeutic alliance)</td>
<td>.009</td>
<td>.005</td>
<td>7.081</td>
<td>1.64</td>
<td>.072</td>
<td>-.003</td>
<td>.02</td>
</tr>
</tbody>
</table>

*Note.* Dependent variable = EPDS Baseline; Week = time measured in weeks; Tx = treatment; Df = degrees of freedom; p values for week and interaction are 1-tailed.
Figure 3. Qualitative analysis summary
Category 1: Positive experiences with MDO. The following eight themes emerged from this category including: (a) accessibility, flexibility, and convenience; (b) anonymity and privacy; (c) helpful information; (d) something for everyone; (e) a step in the right direction; (f) self-understanding and normalization; (g) indirectly benefiting parenting; and (h) therapist individualized treatment. For a more in-depth discussion, these themes have been further clustered under the headings of general value of Internet therapy, value of TAICBT content, and positive experiences with the Internet therapist.

General value of Internet therapy. Participants reported a variety of sentiments regarding the general value of participating in Internet therapy. Specifically, participants commented on the accessibility, flexibility, and convenience of the program as well as the perception of anonymity and privacy.

Accessibility, flexibility, and convenience of the program. Analysis of interviews revealed that participants enjoyed the “easy access to the [Internet] program” that they could complete at home around family obligations. As reported by one participant, “I loved that I didn’t have a scheduled time and could complete it when it was most convenient for my family.” Moreover, many participants appreciated the convenience of TAICBT as it could be completed around childcare practices: “I loved that I could access the program anytime. It fit into my schedule in a way that traditional therapy could not have, as my baby is demanding and my husband works out of town.”

Anonymity and privacy. Participants appreciated completing the program privately from their home. They shared enjoying the Internet-facilitated communication, noting they felt “less judged” when compared with face-to-face therapy. This category was poignantly illustrated in the following quotations:
When my maternal depression was really bad, there was no way I would have left my house to speak with a therapist; I was so weepy, shaky and terrified. The online program was a perfect program for me. I would have no problem speaking with a therapist now, but in those early weeks, the sort of anonymous nature of this program was a God send.

It is sometimes hard to talk to people face to face about issues and feelings of depression when you have never experienced it before, and some thoughts that go along with it can be scary and a person could feel judges even when this is not the case.

Value of TAICBT content. In addition to the general value of Internet therapy, the majority of participants also commented on the content of the TAICBT materials. As discussed in this section, participants expressed finding the information helpful, noting that the program offered something for everyone. Further, participants described the program as “a step in the right direction” that facilitated self-understanding, normalized their experiences, and impacted their parenting.

Helpful information. Participants described feeling grateful for the program’s content and perceived the program as “helpful” and enjoyable. For instance, participants stated:

My experience was excellent, and I am very grateful for the program. . . . I found the modules very helpful and will continue to refer to some of them in the future.

I loved the course and haven’t had an experience like this in the last five years with helping the depression. I feel amazing!

They further reported that the program offered hope and a sense of control over their symptoms, as described by one participant:

My overall experience was positive. . . . There is some very good information in this program that assisted me in learning more about maternal depression. It was comforting knowing that I was working towards eliminating my maternal depression.
Something for everyone. Another positive aspect of the program reported by participants was the variety of modules offered. Participants uniquely preferred some modules over other modules. For instance, some participants identified the cognitive modules as particularly beneficial:

The modules 4 and 5 [cognitive modules] have been the most useful to me personally. [These modules helped me] recognize the “typical negative thoughts” I was having, and practicing to change them to more positive ones is a great coping strategy I use now. It has done wonders.

I truly enjoyed all of it. One of my favourite things was learning to change my thinking styles by realizing that I don’t always have proof to support my negative thinking. There were really a lot of eye-opening moments. To be honest, I had a few “aha” moments, which I shared with my therapist as they occurred. I never expected the feeling of success from completing the modules, but I have been pleasantly surprised with the overall experience.

On the other hand, other participants preferred the behavioural activation module that included activity planning. This module preference was illustrated by the following participant: “The module about activity planning was the most helpful to me. After I started applying what I learned in that module, I knew I was starting to get better.”

Similarly, another participant reported:

The module where I had to plan both enjoyment activities and achievement activities [was most helpful]. This was the module where I realized that my life consisted mostly of achievement activities and that in order to create balance, I needed to increase the enjoyment activities.

A step in the right direction. While some participants reported feeling grateful for the program, others expressed that by participating in the program, they were “at least doing something for my [their] depression.” They reported that working on the TAICBT program offered a “small amount of control” over depressive symptoms, as shared by the following participant:
I did this program at a time when there were a lot of stressors in my life, and my depression seems to have gotten worse, but doing the program made me feel like at least I was working on trying to get better, like I had at least a small amount of control over my depression.

*Self-understanding and normalization.* An additional theme that emerged from the analysis was that it encouraged self-exploration. For instance, participants described the psycho-education presented in the program as “helpful”, and they “enjoyed learning skills to handle my moods and problems.” Participants also identified the psycho-education and treatment materials in the TAICBT program as “basic and easy to understand”, particularly when applying it to their unique personal experiences:

The beginning modules that explain reasons, triggers, etc. It really helped me stop blaming myself and stop feeling like I was somehow “weak”.

Participants also reported reading the modules served to normalize and validate their thoughts and experiences. This experience was poignantly reflected by the following participants:

[I] really liked learning about triggers and reasons women may experience PPD. This is my second child. . . . Why am I having problems now when I experienced much greater challenges with my first? . . . It helped to see some of the reasons why.

I liked being reassured that what I was experiencing was normal and that someone understood, when I felt that no one really did.

*Indirectly benefitted parenting.* An additional advantage of the program that was reported by participants involved how the program indirectly impacted parenting skills. Many participants shared that the TAICBT program allowed them to be more “relaxed and patient” when parenting. Some participants also described that they found greater enjoyment and confidence in parenting after working through the program, as noted in these quotations:
I definitely feel less irritable and, therefore, can handle the stresses of two babies a whole lot better. I am able to let go of “some” other stressors in my life (i.e., a “perfect” house) in order to spend more quality time enjoying the things in my life that matter the most to me.

Felt closer [to my daughter], was reminded I wasn’t alone, so I felt more confident in being with her all day and not taking it personally when her sleep would get off track.

In keeping with how the program positively impacted parenting skills, some participants expressed that they perceived their parenting skills more rationally and began to play a more active role in their children’s lives. Two participants noted:

- It helped me to be more objective about my feelings and thoughts, instead of just being controlled by them. I am now more relaxed and have peace even when I am having a frustrating day (usually). I can also take more joy in my children and do more activities with them because I feel more empowered and confident.

- I found myself having more positive conversations in my head about our interactions and found ways to help me cope with her INSANE screaming fits and complete lack of naps. I also happily locked myself (not her) in a closet twice for 10-minute breathing sessions to calm down when she was freaking out. Helped me regroup and get back to being a good mama.

In line with this category, participants also expressed feeling more empowered in their parenting from skills presented in the program: “It helped me realize I was normal, and it empowered me to make decisions and see that I am a good mommy, so it helped me feel more capable of taking care of his needs and mine.”

**Positive experiences with Internet therapist.** The majority of participants indicated a positive experience with their therapist and often described her as supportive and that she individualized the TAICBT program.

**Supportive therapist.** Many participants expressed that they enjoyed working with the Internet therapist, as illustrated by one participant: “[The Internet therapist was] so helpful and thoughtful. She wasn’t hard on me like I am on myself and really made me
stop and think about how I treat myself.” Participants also indicated that the amount of therapeutic contact and support was appropriate: “It was great having a once a week check in from my therapist. For me, it was just the right amount of contact.” Some shared appreciating the therapist’s support outside of their scheduled check-in day: “I really liked when I could count on her to be there even not at the scheduled time.”

**Therapist individualized treatment.** Participants also shared enjoying working with an individualized therapist who assisted with TAICBT skills: “Sometimes the comments she made were very insightful and helped to augment the module I was working on.” Some participants also found that the therapist’s support made the program “more personal” and described the therapists’ emails as “thorough and detailed”.

**Category 2: Challenges with the TAICBT program.** Although a range of positive experiences were identified, participants also expressed facing some challenges with participating in the TAICBT program. The identified challenges included (a) establishing consistency in logging on, (b) challenging fast pace, (c) difficulties completing homework activities as a mother, (d) drawbacks of not seeing a therapist face-to-face, and (e) website improvements.

**Establishing consistency in logging on.** Participants echoed experiencing difficulty logging online and working through the modules given their limited time and demanding childcare schedule, particularly when starting the program. For instance, one participant shared: “[I] found it hard to remember to come online and get it done, especially when you have a little one running around everywhere! But once you get in a habit and make it a priority it got easier.” Participants, however, reported that commitment to work through the program became easier when “chipping away” on the
modules and when they “started to feel better” (i.e., their depressive symptoms improved). This idea was reflected in this participant’s response:

I enjoy it. I think I need to get more motivated though, too easy to not do. It’s been hard to commit to at times. I feel that when I have spare time, it’s sometimes the last thing I want to do, but by the middle of the therapy, I realized that chipping away at it made it easier (time wise), and I enjoyed it better doing it that way. I always liked it once I got started, but starting sometimes caused some anxieties. You don’t get much free time as a mom!

**Challenging fast pace.** An additional challenge reported by the participants was adhering to the recommended schedule. While participants were encouraged to complete one module per week, many described this schedule as “too quick”, anxiety provoking, and that other demands interfered with timely completion. As shared by one participant:

The only thing I found difficult was adhering to the expected timeline, and often felt anxiety associated with it. However, [the Internet therapist] was very understanding, always encouraging me to work at my own pace. To clarify, it wasn’t due to the length or difficulty of the content, but rather just the demands of my own life with two new babies and a three year old, as well as a sick friend.

Participants also noted that the suggested time frame did not allow sufficient time to retain the information and skills presented, as echoed by this participant: “It seemed like a week often wasn’t enough time for me to do the modules and then absorb some things before having to move on to the next module.”

**Difficulties completing homework activities as a mother.** Participants reported difficulty with finding time to complete the weekly assigned homework activities within the recommended time frame, notably with the demands of an infant—and often other children. Moreover, motivational difficulties related to some activities were described: “Some of the activities are hard to complete with a baby and that ends up aggravating the
issue. Some are hard to want to do, motivation wise, because you have to think about things that make you sad.”

**Drawbacks of not seeing a therapist face-to-face.** Although some participants reported satisfaction with the Internet therapist, other participants expressed missing face-to-face contact with a therapist. Specifically, some participants described the Internet therapy as “not as personalized as one on one in-person counseling” and that an “in-person therapist would be able to personalize the learning process a little more, and spend more time on things I needed to spend more time on.”

**Category 3: Future directions of TAICBT programs.** Participants expressed thoughts with respect to how the program can improve for future users. Specifically, the majority indicated interest in connecting with other moms through an Internet-facilitated forum. Ideas that were reported by a minority of participants were categorized as action items.

**Connecting with other moms through an Internet-facilitated forum.** When asked about adding a forum to the current program (i.e., chat room), many participants described this as a “helpful addition” and potentially “beneficial”. Of note, many participants requested that the forum be well-moderated by a therapist “so we wouldn’t bring each other down”. Participants shared that a forum could be a means of connecting with other mothers and normalizing symptoms, as evidenced in the following quotations:

Going back to that feeling of being “misunderstood”, maybe talking to other anonymous moms would be a valuable resource!

It would be great to correspond with others who are going through the same thing. For me, it would be so encouraging to know that I’m not alone.
**Website improvements.** Participants provided some suggestions to improve the website, but overall little feedback was offered in this regard. Some specific suggestions offered by a few of the participants included that mothers would prefer if each module came with a printable summary. Several mothers also commented that the videos could be improved (e.g., “the speakers on the videos were on the whole rather boring and un-engaging, though I loved their accent!”). Further, some participants suggested that the website should allow for the completion of PDF documents directly online rather than having to download and print them off. Some participants also expressed interest in sending the therapist attachments through the website (e.g., examples of homework). Currently, the website’s messaging system does not include an attachment feature.
CHAPTER SIX: DISCUSSION

PPD is among the most common clinical disorders following childbirth and impacts approximately 8 to 15% of Canadian mothers (Chalmers et al., 2008; Clarke, 2008). In addition to the distress and impairment experienced by women afflicted with PPD (Pearlstein et al., 2009), the disorder also adversely impacts the children of these women, including behavioural problems and impaired cognitive and emotional development (Beck, 1998; Feldman et al., 2009). A meta-analytic review has provided evidence to support the efficacy of psychological treatments for PPD, with an overall effect size in the moderate range (Cuijpers et al., 2008). Despite effective treatment options, many women afflicted with PPD do not receive treatment for reasons such as lack of time, stigma associated with mental health treatment, and childcare issues (Goodman, 2009). Consequently, researchers have been studying innovative options for delivering psychological treatment, including the provision of therapy over the Internet.

Since the proposal of this research, an 11-week Internet behavioural activation treatment has proven efficacious for the treatment of PPD compared with treatment as usual (O’Mahen et al., 2013) and an eight-module TAICBT program has also demonstrated efficacy for economically disadvantaged mothers of young children compared with treatment as usual (Sheeber et al., 2012). However, to date, researchers have not investigated the efficacy of TAICBT for the treatment of PPD (i.e., depressed symptoms reported within the first year following childbirth).

The aim of the present study was to contribute to the literature by determining the efficacy of TAICBT for PPD. Fifty women with self-reported sub-threshold and full-syndrome PPD were randomly assigned to receive either specialized TAICBT for PPD or
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

a waitlist control condition (i.e., no active treatment and an emailed information pamphlet). Questionnaires were administered to both groups at pre- and post-treatment. Participants in the TAICBT group were also assessed four weeks following the end of treatment. The research addressed several relevant symptoms and issues, including an examination of PPD symptoms, general stress, general anxiety, parental stress, quality of life, as well as therapeutic alliance, treatment satisfaction, and perception of treatment credibility. Sophisticated quantitative analyses were computed, including multilevel mixed models and an examination of the reliability and clinical significance of change. Furthermore, using qualitative analyses, the participants’ responses to open-ended questions regarding their experiences with TAICBT were explored. Findings from the study, including how the results can inform future TAICBT treatments and limitations and future research directions, are discussed.

**Efficacy of TAICBT**

According to hypotheses one and two, participants receiving the TAICBT program, but not the WLC group, would evidence greater symptom improvements from pre- to post-treatment on all primary and secondary outcome measures. The changes on the primary outcome measures were also expected to be reliable and clinically significant. The results of these hypotheses were mixed. Participants receiving the TAICBT program evidenced significantly lower levels of PPD (as measured by the EPDS), with reductions on the subscale measuring anxiety, when compared to the WLC group. The clinical significance and reliability of this change was also confirmed, and the two groups differed according to magnitude of change. Further, results also suggested that participants who received TAICBT and indicated satisfaction with the treatment
demonstrated a greater reduction in PPD symptoms over time when compared with participants who reported lower treatment satisfaction.

With respect to the secondary measures, when compared to the WLC group, the participants receiving the TAICBT program demonstrated significantly lower levels of stress (as assessed by the DASS-Stress subscale) and parental distress (as assessed by the PSI subscale), and they exhibited greater improvements in psychological health and environmental quality of life (as assessed by the WHO Domains 2 and 4 subscales, respectfully). No other significant differences were found at post-treatment on other secondary outcome subscales assessing general depression, parental stress, and quality of life.

**Alleviating symptoms of PPD.** While the efficacy of the TAICBT program with respect to the secondary measures was not entirely consistent with predictions, the results of the analyses of the first and second hypotheses provided a number of important insights about TAICBT for the treatment of PPD. The findings offer promising support to suggest that over time, TAICBT is more effective than a wait period for alleviating symptoms of PPD. These differences were clinically significant and reliable, and a large effect size was revealed. These results were expected given evidence to support the efficacy of Internet behavioural activation for PPD (O’Mahen et al., 2013), TAICBT for economically disadvantaged mothers of young children (Sheeber et al., 2012), and face-to-face CBT for PPD (e.g., Wiklund et al., 2010). Further, approximately 20% of participants who received TAICBT were considered improved, while over 62% were considered recovered. On the other hand, while 38% of the participants allocated to WLC condition demonstrated improvement or recovery of symptoms, over 50% exhibited no
change, and two participants deteriorated. This suggested that although some WLC participants did improve with respect to PPD symptoms during the wait period, closer examination demonstrated that the degree of recovery was substantially greater in the TAICBT group. The high rate of recovery evidenced by the TAICBT participants was promising given not only the morbidity and consequences associated with PPD for the mother (Pearlstein et al., 2009), but also the pervasive effects PPD has on the family of the woman impacted (Beck, 1998; Feldman et al., 2009). Moreover, a recent meta-analysis of 19 studies indicated that approximately 53% of existing cases of untreated major depression remit spontaneously in a given year (Whitwood et al., 2013). Given that over 60% of TAICBT participants were considered recovered from TAICBT, it is suspected that these women are less inclined to remit when compared to untreated individuals. Further, the MDO program includes a “Maternal Depression Recovery Plan” in the final module. This therapeutic exercise encourages the client to identify and document CBT strategies that they found helpful during the program and to create a plan to implement such strategies in the event of future depressive thoughts or feelings. Arguably, this exercise will not only assist with maintaining the client’s therapeutic skills, but also reduce the occurrence of symptom remittance in the future.

Reducing general stress and parental distress. Findings from this research also indicated that participants working through the TAICBT program evidenced a significantly greater reduction in general stress symptoms (as assessed DASS-stress subscale; see also Appendix C) and parental distress (as assessed by the PSI subscale; see also Appendix D) when compared to the WLC group. This is an important finding given that a recent study reported that Canadian prenatal women are approximately seven times
more likely to experience symptoms of PPD when “very stressed” and twice as likely to develop symptoms of PPD when “somewhat stressed” (Lanes, Kuk, & Taminm, 2011, p. 302). Thus, even a minor reduction in stress may have resulted in a reduction in PPD symptoms. With respect to the reduction in parental distress, Sheeber and colleagues (2012) also reported that TAICBT for women of young children was effective at reducing parental stress and harsh parenting behaviours as well as increasing parental satisfaction and efficacy. Further, literature suggested that face-to-face CBT for PPD may improve cognitions around parenting and child behaviour (Ammerman et al., 2011). While the TAICBT program did not directly target stress or parental distress, strategies aimed to reduce depression and anxiety were likely helpful to ameliorate these symptoms. For instance, the problem-solving and relaxation modules may have contributed to the reduction in stress and parental distress. Future dismantling research could further investigate the effectiveness of a variety of strategies aimed to reduce stress and parental distress associated with PPD.

**Reducing anxiety.** Contributing to the literature, findings from this research also indicated that participants working through the TAICBT program evidenced a significantly greater reduction in anxiety symptoms (as assessed by the EPDS-Anxiety subscale; see Appendix E) over time when compared to the WLC group. This was consistent with findings reported by Morrell and colleagues (2011), who found a reduction in anxiety symptoms resulting from face-to-face CBT and face-to-face person-centred therapy for PPD. However, previous Internet intervention studies for PPD did not investigate the impact of Internet therapy on anxiety symptoms (e.g., O’Mahen et al., 2013; Sheeber et al., 2012). Interestingly, unlike depression symptoms, participants in the
WLC group did not evidence a reduction of anxiety symptoms over the wait period, suggesting that anxiety was more stable over time than depression.

The reduction of anxiety symptoms reported by TAICBT participants is an important finding given that 40% of women who meet diagnostic criteria for PPD also meet criteria for a comorbid anxiety disorder (Austin et al., 2010). It is speculated that the relaxation module, in particular, included in the TAICBT program assisted with the reduction in anxiety symptoms. Future dismantling research could investigate the effectiveness of a variety of relaxation strategies aimed to reduce anxiety reported in postnatal populations. For instance, the MDO program includes relaxation exercises ranging from time-efficient strategies (e.g., “Relaxation on the Run”, deep breathing) to time intensive exercises (e.g., guided imagery, progressive muscle relaxation). Stemming from the unpredictable time demands of motherhood, it is speculated that time efficient relaxation exercises may be more realistic and effective for postnatal anxiety as opposed to time-intensive exercises. Researchers could investigate this area in an effort to improve future treatment programs for postnatal disorders.

**Changes in Quality of Life**

With respect to quality of life, results approached statistical significance for group differences concerning psychological health and environmental quality of life. It is predicted that these results would have been statistically significant had a larger sample size been utilized. These findings have suggested that participants who received the TAICBT program tended to report greater change with respect to cognitive factors (i.e., thinking, learning, memory, and concentration) as well as differences concerning self-esteem and body image. Further, following completion of the TAICBT program,
participants were more inclined to report changes related to environmental factors (i.e., recreation and leisure activities, physical safety and security, financial stability, and social care). While significant group differences were not reported for the other quality of life domains (i.e., spirituality, level of independence, and social relationships), the results indicated that participation in TAICBT can more broadly impact other important areas in a woman’s life. Resulting from the minimal time frame between the administration of the measures (i.e., approximately seven to 10 weeks), it is possible that a greater magnitude of change with respect to quality of life, as well as other areas, may have been detected had a longer follow-up been implemented.

Secondary outcome measures. When comparing the TAICBT group to the WLC group, significant improvement on the other secondary outcome measures was relatively low, including general depression, general anxiety, overall parental stress, and select domains of quality of life. Interestingly, while the results found significant group differences in depression and anxiety symptoms when assessed using the EPDS, the results were not statistically significant when measuring these symptoms using the DASS-21. This may have been the result of the sensitivity of the DASS-21 to assess postnatal depression and anxiety. Indeed, Boyd, Le, and Somberg (2005) identified that general depression measures can rely on somatic symptoms of depression, which significantly overlap with physical symptoms associated with the postpartum period. Further, general measures do not often include common postpartum fears and worries such as concerns regarding postnatal changes to personal and marital life (Austin et al., 2010). In other words, the DASS-21 may have not been as sensitive as the EPDS (i.e., a specialized measure designed for postnatal populations) to detect the unique experiences
and symptoms reported by the postnatal participants. A review of eight self-report measures used to assess symptoms in the postpartum period found that the EPDS is the most extensively studied measure with postpartum women and the measure demonstrates moderate psychometric soundness (Boyd et al., 2005).

While statistically significant group differences were revealed with respect to parental distress, group differences were not identified for the other parental stress subscales (i.e., the dysfunctional parent-child interaction and difficult child subscales). While these findings were not expected, the measure selected to assess parental stress (i.e., the Parental Stress Inventory; see also Appendix D) may not have adequately tapped into the parental stress reported by women with PPD. Of note, the measure was validated by Abidin (1995) on a sample of mothers of young children (mean age under four years) and a variety of questions focused on parental stress related to caring for an older child. For instance, rating items on a Likert scale based on participant agreement, one item asked: “My child rarely does things that make me feel good”, while another item posed “Sometimes my child does things that bother me just to be mean.” Arguably, these questions are targeted at parents of older children and lack validity for women with children under the age of one. To elucidate our understanding of parental stress, future research validating a measure for parental stress reported specifically in the postpartum period is warranted.

**Long-term impact of TAICBT.** It was speculated that for participants treated with TAICBT, PPD symptom improvements would be maintained four weeks following the conclusion of treatment. This hypothesis was supported, thus providing preliminary evidence in support of the durability of the program effects. Although the follow-up
period was limited, this finding aligned with a recent review of 22 computer therapy programs for anxiety and depression that found no evidence of relapse ranging from four to 52 weeks (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010). Previous Internet therapy programs for women with PPD and mothers of young children have also reported that the intervention effects were maintained at 12- and 15-week follow-up (O’Mahen et al., 2013; Sheeber et al., 2012). Given the fluctuating demands of parenting and that PPD is directly related to future episodes of clinical depression (Phillipps & O’Hara, 1991), more extensive follow-up assessment (e.g., one year) to further understand the long-term efficacy of TAICBT for PPD is warranted. Additionally, although a follow-up comparison of TAICBT and WLC participants was not conducted due to ethical reasons, the trajectory of changes evident in the lattice plot (see Appendix R) suggested greater symptom reduction over time evidenced in the TAICBT group when compared with the WLC group. To further explore the long-term impact of TAICBT, future research could investigate TAICBT compared to an active online treatment condition using a longer follow-up period. This research would determine whether TAICBT is more efficacious than other online treatments over the longer term.

**TAICBT treatment variables.** The goal of hypothesis four was to determine satisfaction with and feasibility of the TAICBT program. In accordance with this hypothesis, the results were promising, with approximately 75% of participants who completed the TAICBT program rating the program as useful, while close to 72% reported enjoying working through the modules. Participants who reported satisfaction with the program evidenced a greater reduction in PPD symptoms over time. Also supporting this hypothesis, over three quarters of the participants described their
symptom reduction as “good”, reported satisfaction with the overall program, and noted enjoying communicating with their Internet therapist. Participants varied with respect to the number of days they accessed the program, ranging from 8 to 129 days. This variability highlighted the importance of offering flexibility in clinical practice with respect to TAICBT treatment completion. To enhance our understanding, future research should explore whether treatment duration is related to PPD symptom reduction.

These findings are promising given the numerous face-to-face treatment barriers that are reported by women afflicted with PPD (e.g., Maloni, Przeworski, & Damato, 2013). It is speculated that the high ratings of treatment satisfaction may be attributed to the TAICBT program overcoming unique face-to-face treatment barriers for postnatal women. For instance, the participants completed the therapy at a convenient time and around childcare duties. Indeed, review of the time emails were sent, as documented on the website applications, showed participant emails were often sent in the early morning, after 11 pm, or on the weekends. Arguably, these times would not be available to schedule face-to-face therapy.

Another potential factor that may have contributed to satisfaction with TAICBT was that the participants completed the therapy from home. Some participants resided in rural Saskatchewan, while others completed the program between the winter months of January and April. The TAICBT program presented an option to receive treatment for PPD from the convenience and safety of the participants’ homes, regardless of driving conditions or the extreme winter climate. The high treatment satisfaction reported in this study aligned with Maloni and colleagues (2013), who found that 90% of women who self-reported PPD indicated that they would use the Internet to learn treatment strategies
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

for PPD, and over half reported a willingness to access an Internet-facilitated intervention for PPD. Given this information, it would be interesting for future research to compare client preference of TAICBT with face-to-face CBT for PPD. Stemming from the multiple demands of parenting and the unique treatment barriers associated with face-to-face treatment, it is possible that postnatal clients may report greater satisfaction with TAICBT and potentially greater adherence to TAICBT when compared to face-to-face treatments.

With regard to feasibility, attrition was exceptionally low, with less than 20% of participants terminating the study. Further, TAICBT participants evidenced very high levels of program engagement, completing on average more than 80% of the modules, and nearly 60% of participants completed all seven modules. These finding were promising given that O’Mahen et al. (2013) had exceptionally high attrition rates for an Internet behavioural activation intervention for PPD that included weekly email reminders and not therapist assistance. On the other hand, for a TAICBT program offered to mothers of young children that included weekly telephone calls from a therapist, 63% of participants completed all treatment modules (Sheeber et al., 2012). Collectively, these findings were in accordance with a meta-analysis that demonstrated that for clients diagnosed with major depression, when compared with self-administered ICBT, some form of guidance is superior (i.e., TAICBT; Spek et al., 2007).

With respect to maternal depression, it appears that planned, scheduled therapeutic contact improves treatment adherence and reduces attrition. Often, as demonstrated in the current study, an online therapist will contact their client on a weekly basis, and this frequency of Internet therapeutic contact has been validated in a sample of
clients diagnosed with panic disorder (Klein et al., 2009). Research, however, has yet to establish the ideal frequency of therapist-client contact to achieve the greatest symptom reduction for women afflicted with PPD. Given the multiple demands and challenges of parenting (particularly for first time parents), coupled frequently with low levels of social support (Xie et al., 2009), women with PPD may reap additional benefits from more frequent therapeutic contact (e.g., twice a week). This is an area of research that warrants future investigation.

While not all participants completed MDO, conceivably some participants who did not complete all modules may have gained sufficient information and skills they needed from the program. It would have been helpful to evaluate treatment satisfaction throughout participation in TAICBT, rather than only at one time point (i.e., Time 2, post-treatment). It is speculated that participants who terminated early were satisfied with the information they received and were not interested in the additional modules. Further, a recent development in the field is to tailor TAICBT treatments according to client profile, which has the potential for clients to select therapeutic modules of interest and to potentially address comorbid conditions such as anxiety (e.g., Andersson et al., 2011). More research is required regarding the tailoring of computerized programs to the needs of women with PPD. Perhaps treatment adherence would have been even higher had the participants been able to select modules and tailor MDO according to their unique needs and preferences.

Therapeutic Alliance

The final hypothesis posited that participants would report a strong therapeutic alliance, and post-treatment therapeutic alliance would be related to reduction in
symptoms of PPD. In line with previous research suggesting that a strong therapeutic relationship can be established in TAICBT for depression (Preschl et al., 2011; Sheeber et al., 2012), the results were confirmed. Specifically, participants established a high level of therapeutic alliance proving a rating of over 86%. This finding suggests that, for postnatal clients, it is possible to build an online therapeutic relationship based on an average of 69 days involved in the program, receiving 11 therapeutic emails, and sending 5 messages to their therapist. While participants reported a strong therapeutic alliance, the results indicated that therapeutic alliance was not significantly related to change in PPD symptoms over time. This result replicates Preschl et al. (2011), who found that working alliance did not significantly predict change in depression symptoms at mid or post-treatment for a TAICBT program. It should be noted that there are limited validated measures to assess Internet therapeutic or working alliance. It could be possible that the Therapeutic Alliance Questionnaire (TAQ) did not adequately capture therapeutic alliance established online in this study. Indeed, the TAQ was originally validated on face-to-face therapeutic alliance (Luborsky et al., 1996). Further, Knaevelsrud and Maecker (2007) highlighted the importance of investigating the process of the therapeutic relationship to elucidate the relationship between therapeutic alliance and treatment outcome. Thus, using a validated measure of Internet therapeutic alliance, future research could explore therapeutic alliance throughout the treatment, rather than at one time point, to further investigate the relationship between therapeutic alliance and treatment outcome for PPD treatment programs.

These findings are promising given literature to suggest that postnatal women commonly experience difficulty communicating with face-to-face practitioners and the
stigma associated with seeking mental health treatment (Goodman, 2009). Corresponding with an online therapist while participating in TAICBT may assist with overcoming these challenges. Moreover, it is speculated that the participants may have experienced an enhanced comfort expressing their emotions anonymously through text, or through perceived anonymity, which may foster therapeutic alliance by increasing the amount of personal self-disclosure over the Internet. Indeed, the fear of rejection that may prevent disclosure in face-to-face relationships is arguably less apparent over the Internet. Of note, the participants in this study were highly educated and, therefore, may be more comfortable expressing their thoughts via text when compared to a less educated sample. To further understand the nature of therapeutic alliance, future research should compare therapeutic alliance reported by postnatal women receiving face-to-face therapy to TAICBT using a more representative sample. Moreover, research should also investigate email exchanges shared between clients afflicted with PPD and their Internet therapist to enhance our understanding of the development of a supportive Internet therapeutic relationship.

Given the satisfaction with the online program, the findings lend support to the notion of patient-centered care. The Institute of Medicine described patient centered care as “care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions” (2001, p. 40). Offering TAICBT as an evidence-based treatment for PPD could provide an additional treatment option that may suit many women’s preferences, needs, and values.
Qualitative Analysis Examining Participants’ Experiences

Thematic analysis of 12 participants’ accounts of the TAICBT program suggested that postnatal women generally reported positive experiences with TAICBT but also noted challenges related to TAICBT. Confirming the quantitative findings regarding satisfaction with the program, a positive aspect echoed by the majority of participants was the accessibility, flexibility, and convenience of TAICBT. These findings demonstrate that Internet therapy has the ability to address several face-to-face treatment barriers that have been previously reported (Dennis & Chung-Lee, 2006). Arguably, if treatment for PPD can be accessed from the convenience of a woman’s residence, she may not only be more inclined to pursue treatment, but also be more likely to complete the treatment as she can work through modules at a time that suits a demanding and unpredictable schedule.

Another promising finding reported in the open-ended responses that was not captured in the quantitative analyses was that, while the TAICBT program targeted depressive symptoms, participants noted the program indirectly benefited parenting. More specifically, women expressed that the TAICBT program was helpful for parenting, resulted in greater enjoyment with childcare, and enhanced coping skills with respect to parenting. This finding corresponds with existing literature suggesting that face-to-face CBT for PPD may improve cognitions around parenting and child behaviour (Ammerman et al., 2011) and that TAICBT for maternal depression is effective at reducing parental stress, harsh parenting behaviours, as well as increasing parental satisfaction and efficacy (Sheeber et al., 2012). It would be thought provoking to explore whether a TAICBT program with a module directly targeting parenting skills results in
even greater parental benefits than a standard TAICBT program for PPD, particularly for first-time parents.

In line with the qualitative findings and previous research suggesting that a strong therapeutic relationship can be established in TAICBT for depression (Preschl et al., 2011; Sheeber et al., 2012), responses to open-ended questions revealed that most participants described their Internet therapist favourably. Former qualitative research has identified statements exchanged between therapists and clients participating in TAICBT for generalized anxiety disorder, such as task reinforcement, self-efficacy shaping, and alliance bolstering (Paxling et al., 2013). Future research should investigate email exchanges shared between clients afflicted with PPD and their Internet therapist to further understand the development of a supportive Internet therapeutic relationship.

This research also resulted in unique findings that were not captured by the quantitative analyses and have not been reported in the literature. For instance, a variety of TAICBT modules were perceived as an asset to the program, and the program appeared to present something appealing for all participants. Indeed, some women described the behavioural activation module as the most beneficial, while other women reported benefiting from the cognitive modules. Given this finding, to reduce attrition, it may be important for facilitators of future TAICBT programs to inform participants that they may find some modules more helpful than others. Similar to other TAICBT for PPD programs (e.g., Sheeber et al., 2012), this specialized program offered had a greater emphasis on behavioural activation and lesser focus on cognitive restructuring. Future dismantling studies could investigate whether the order of module content and the amount of attention devoted to behavioural and cognitive strategies impacts TAICBT
outcome. An additional unique finding that emerged was that women appreciated the anonymity and privacy offered through TAICBT. This is an important result, as many women struggling with PPD report fearing stigmatization with respect to seeking mental health treatment (Rochlen, Beretvas, & Zach, 2004). Arguably, if postnatal women feel comfortable addressing their concerns in an anonymous fashion through Internet therapy, they may be more inclined to seek out services.

While participants’ positive experiences with the program were a prominent theme of our results, participants also described experiencing some challenges with TAICBT. These challenges may be helpful with respect to creating and improving TAICBT programs for PPD. For instance, participants reported that they struggled with establishing a habit of logging online consistently, particularly when starting treatment. This was an important finding, as results from a recent study suggest that participants with major depression who report lower motivation to work independently appear to be less well suited for TAICBT (Bendelin et al., 2011). It may be useful to assess frequency of program access and motivation on an ongoing basis to improve the outcomes of TAICBT for PPD. If motivation appears to be low for women interested in TAICBT, future research could determine if starting TAICBT treatment with motivational interviewing results in greater treatment outcomes, as found in other clinical populations, prior to starting face-to-face CBT (Westra & Dozois, 2006).

In line with findings from an Internet behavioural activation treatment program for PPD (O’Mahen et al., 2013), our analyses suggested that participants described the pace of TAICBT as challenging and also reported difficulty completing the assigned exercises due to childcare challenges. An important consideration for future research
would be to explore the optimum recommended pace and magnitude and number of assigned exercises/homework for TAICBT for PPD. While most research studies using other clinical populations have suggested clients complete one module a week (e.g., Klein, Meyer, Austin, & Kyrios, 2011), this does not necessarily reflect participant preferences. Given the multiple demands of motherhood (i.e., feeding schedules, lack of sleep), it is possible that women working through TAICBT for PPD may require additional time and less-demanding assigned exercises when compared to other clinical populations.

Although most participants expressed positive experiences with their Internet therapist, several women shared that they missed face-to-face therapist contact and noted that a face-to-face therapist could have personalized the treatment. Research examining clients’ perceptions of their Internet therapist has yielded mixed findings. While some researchers have found no difference between Internet therapy and face-to-face treatment with respect to therapeutic alliance (Cook & Doyle, 2002), others have shown an advantage of face-to-face treatment (Leibert et al., 2006). Strategies to enhance therapeutic alliance between an Internet therapist and a woman with PPD warrant investigation.

As a potential future addition to the TAICBT program, participants indicated an interest in an Internet-facilitated forum to connect with other mothers. This finding aligned with past qualitative research demonstrating that women with PPD describe support groups as an avenue to connect with “like persons”, alleviate loneliness, bolster self-esteem, and provide a “safe” environment to express thoughts (Holopainen, 2002, p. 41). However, preliminary research did not support Internet-facilitated forums offered...
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

in conjunction to Internet therapy. In a recent study, only 7% of participants posted on a chat room/online clinic that was offered in conjunction with Internet treatment for women with PPD (O’Mahen et al., 2013). Further exploration of Internet-facilitated forums is needed to discern if they in fact contribute to the efficacy of TAICBT.

Contributions

Considering the limited amount of literature with respect to Internet therapy for the treatment of PPD, this study has offered several important contributions. First, while past efficacy research has provided evidence in support of TAICBT for the treatment of major depressive disorder (for a review, see Johansson & Andersson, 2012) and depression reported by mothers of children less than five years (Sheeber et al., 2012), no published study has investigated TAICBT specifically for PPD (i.e., women who have given birth in the past year). Through conducting a randomized control trial, the results from a mixed-model analysis, computation of clinically significant change, examination of the maintenance of gains, and qualitative analysis of the post-treatment responses have indicated that TAICBT should be considered a promising intervention for the treatment of PPD. Further, MDO was evaluated on women afflicted with sub-clinical and clinical PPD; therefore, the results may suggest that this form of treatment fits well into the stepped-care model. In this model, TAICBT could be offered to women with less severe symptomatology (i.e., mild to moderate PPD), while the more intensive treatments are kept reserved for women with greater symptomatology (e.g., severe depression, suicidal symptoms; Newman, 2000).

A second contribution was the findings regarding satisfaction and therapeutic alliance with TAICBT in a sample of women afflicted with PPD. Given that no study to
date has investigated postnatal women’s experience with TAICBT and their perceptions of working with an online therapist, these findings may assist researchers and clinicians with the development and improvement of specialized TAICBT programs.

Third, the qualitative responses provided further information in support of TAICBT for PPD. These findings provided valuable and rich insight into the participants’ perceptions and experiences with a TAICBT program for PPD. Further, barriers and facilitators of this innovative treatment approach were revealed that were not captured through the quantitative findings. This information can be used to create and improve future TAICBT programs.

Limitations

Although this research has advanced the literature on the efficacy and experience of TAICBT for PPD, there were a number of methodological limitations that should be considered. The sample utilized in this research was relatively small, providing power to detect only medium and large effects. The small sample also prohibited an examination of other factors such as severity or complexity of the disorder (e.g., comparing sub-clinical versus clinical PPD, examining comorbid anxiety symptoms). A larger sample of participants may have been more sensitive to detect small change and would have allowed for additional analyses. Increasing power and sample size, however, is challenging, as recruitment to clinical research is time consuming, costly, and arduous, particularly for the specificity of this disorder and the size of the dissertation research. Indeed, recruitment for this study occurred over a 10-month period in a small western Canadian city and entailed multiple forms of advertisement (e.g., posters, newspaper advertisements, radio and television appearances, presentations to support groups).
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

conducted at multiple time points. With successive recruitment attempts, there was a notable decrease in interest in the online treatment, suggesting that the novelty of the online approach may have reduced. Over time, it was also more challenging to attract free media attention, such as news stories, television appearances, and online advertisements.

A second limitation of this research was the homogeneity of the sample with respect to demographic characteristics. Indeed, all of the participants resided in Saskatchewan, and the majority were Caucasian and well-educated. Given these demographic factors, it is possible that the sample in this research may have been more technologically savvy than other more heterogeneous samples. Future research should replicate the current study using a more diverse sample including participants from varying provinces, ethnic backgrounds, socio-economic statuses, and ranging in educational attainment.

A third limitation of the research was the absence of long-term follow-up for the WLC group and the limited long-term follow-up for the TAICBT group (i.e., four weeks). A comparison of the WLC condition to the active treatment at follow-up was not conducted, which would have been informative given that PPD is often a spontaneously remitting condition (Whitewood et al., 2013) and, therefore, may improve over time irrespective of treatment. While having the WLC group complete the four-week follow-up questionnaires would have enabled a longer-term comparison of the treatment groups, for ethical reasons, we did not want the distressed WLC participants to wait to receive TAICBT treatment longer than 10 weeks. In addition, while a longer follow-up is clearly warranted, only a four-week post-treatment follow-up for the TAICBT group was
conducted due to the time constraints of conducting doctoral research. However, a 12-month follow-up would have enabled an evaluation of TAICBT over the longer-term.

A fourth limitation was that these findings are specifically related to one TAICBT program (i.e., Maternal Depression Online) and thus may not be representative of other TAICBT programs. Furthermore, with respect to therapeutic alliance, the Internet therapist (principal investigator, N. Pugh) and her supervisor in the TAICBT program are trained in clinical psychology. Participants may report varying experiences when working with therapists trained in other specialities, such as GPs, social workers, or coaches (e.g., Johnston, Titov, Andrews, Spence, & Dear, 2011; Shandley et al., 2008).

Fifth, only self-report measures were included in the design. Aiken (2002) indicated that individuals may over-report symptoms in order to make their situation seem worse, or they may under-report the severity or frequency of symptoms in order to minimize their problems. Unfortunately, there are few practical and well-standardized indirect and non-reactive measures of the psychological variables of interest in this study.

Finally, the qualitative results should be considered with caution. The nature of questioning posed a limitation to the current study. While the questions were open-ended, they were completed online, and follow-up questions were not queried. Conducting in-person interviews with follow-up questioning may have resulted in a richer description of participants’ experiences. The open-ended questions regarding future directions for TAICBT programs formed another limitation, as the questions focused primarily on asking participants about the addition of an online forum and did not inquire about other avenues. It is also recognized that text involves multiple meanings; therefore, the qualitative results are dependent on the interpretation of the researchers (Graneheim &
Lundman, 2004). To address the issue of bias, the data analysis was conducted by two coders to achieve some objectivity in generating the results.

**Future Research Directions**

Given the dearth of literature in the area of TAICBT for PPD, future research directions are abundant. To begin, additional well-designed trials of TAICBT for PPD are required. It is suggested that these studies include a larger, more diverse sample, longer-term follow-up times, varying online therapeutic contact and styles (e.g., weekly versus bi-weekly therapist contact, telephone versus email versus audio/video correspondence), and an investigation of a moderated online forum. Additionally, future trials should not only explore whether the specialized program is effective, but also investigate the efficacy of the different therapeutic modules through dismantling strategies (e.g., the amount of attention devoted to behavioural versus cognitive strategies). This research may shed light on the unique mechanisms of change associated with TAICBT for PPD.

The comparison of TAICBT to face-to-face CBT for PPD as well as other online treatment modalities (e.g., online behavioural activation treatment, online cognitive therapy) would also be beneficial, as not all participants responded favourably to TAICBT.

Given the efficacy of TAICBT for PPD and the qualitative results indicating satisfaction with the accessibility, flexibility, and convenience of TAICBT, future research exploring TAICBT for the treatment of other perinatal clinical disorders is warranted. For instance, while case studies have focused on TAICBT for prenatal anxiety (Hantsoo, Epperson, Thase, and Kim, 2013) and online therapy after pregnancy loss (Kersting, Kroker, Schlicht, & Wagner, 2011), controlled clinical trials are needed to
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

determine the efficacy of such treatments. Further, recent research has explored transdiagnostic TAICBT for general depression and anxiety (Titov et al., 2011). Given the high comorbidity between postnatal anxiety and PPD (Austin et al., 2010), a TAICBT program that presents more general treatment ingredients could target multiple postnatal conditions, such as postnatal anxiety and PPD.

The qualitative results revealed that most participants described their Internet therapist favourably. Former qualitative research has identified statements exchanged between therapists and clients participating in TAICBT for generalized anxiety disorder, such as task reinforcement, self-efficacy shaping, and alliance bolstering (Paxling et al., 2013). Future research should investigate email exchanges shared between clients afflicted with PPD and their Internet therapist to further understand the development of a supportive Internet therapeutic relationship.

Although only a small number of participants (i.e., three) dropped out of TAICBT and some participants indicated drawbacks of TAICBT in the post-treatment qualitative questions, future therapy trials should include a more comprehensive assessment of treatment acceptability. More specifically, it would be helpful to understand what participants did not find helpful so that other alternative treatment options could be developed. Finally, to facilitate healthcare planning and economic evaluation of postnatal treatments, future trials should include an assessment of the impact of TAICBT on the utilization of healthcare resource.

Conclusions

In summary, this study was the first to investigate the efficacy of TAICBT for women afflicted with PPD. Although the results were mixed, overall, the findings
indicated that TAICBT is effective for reducing symptoms of PPD, postnatal anxiety, parental distress, and improving some domains of quality of life. Follow-up analyses indicated that the PPD symptom reduction evidenced in the TAICBT group was not only maintained, but continued to reduce over time. Further, the magnitude of change differed according to groups, with more TAICBT participants meeting the “recovery” and “improved” criteria compared to the WLC group. The results indicated that participants were satisfied with TAICBT and established a strong alliance with their online therapist. Finally, the qualitative findings provided valuable and rich insight into women’s perceptions and experiences with TAICBT. Future research should replicate this study using a larger, more diverse sample and investigate the efficacy of TAICBT for the treatment of other perinatal disorders.
REFERENCES


INTERNET THERAPY FOR POSTPARTUM DEPRESSION


INTERNET THERAPY FOR POSTPARTUM DEPRESSION


INTERNET THERAPY FOR POSTPARTUM DEPRESSION


Henshaw, C. (2003). Mood disturbance in the early puerperium: A review. *Archives of Women’s Mental Health*, 6(Suppl. 2), S33-S42. doi:10.1007/s00737-003-0004-x


*Qualitative Health Research, 15*, 1277-1288. doi: 10.1177/1049732305276687


*Behavior Therapy, 15*, 336-352.


INTERNET THERAPY FOR POSTPARTUM DEPRESSION


INTERNET THERAPY FOR POSTPARTUM DEPRESSION


behavioural counselling for post-natal depression. *Australasian Psychiatry, 9*,
255-259. doi:10.1046/j.1440-1665.2001.00330.x

Preschl, B., Maercker, A., & Wagner, B. (2011). The working alliance in a randomized
controlled trial comparing online with face-to-face cognitive-behavioral therapy
for depression. *BMC Psychiatry, 11*, 189-244X-11-189. doi:10.1186/1471-244X-
11-189

Reck, C., Stehle, E., Reinig, K., & Mundt, C. (2009). Maternity blues as a predictor of
DSM-IV depression and anxiety disorders in the first three months postpartum.
*Journal of Affective Disorders, 113*, 77-87. doi:10.1016/j.jad.2008.05.003

and alliance in internet based psychotherapy: Preliminary results. *Counseling and
Psychotherapy Research, 6*, 164-168.

the inclusion of stress management information improve end-state functioning?
*Clinical Psychologist, 10*, 2-15.

Postpartum depression and mother–infant relationship at 3 months old. *Journal of
Affective Disorders, 70*, 291-306. doi:10.1016/S0165-0327(01)00367-6

Ritterband, L., Cox, D., Gordon, T., Borowitz, S., Kovatchev, B., Walker, L., & Sutphen,
J. (2006). Examining the added value of audio, graphics, and interactivity in an
internet intervention for pediatric encopresis. *Children’s Health Care, 35*(1), 47-
59.


INTERNET THERAPY FOR POSTPARTUM DEPRESSION


APPENDIX A. ADVERTISEMENT

DO YOU HAVE A NEW BABY?
ARE YOU CONCERNED ABOUT FEELING DOWN OR DEPRESSED?

YOU ARE NOT ALONE.

If you are experiencing symptoms of depression, have a child under the age of one, are over 18 years of age, and have access to a computer with the internet, you may be eligible to participate in a research study that evaluates the effectiveness of online therapy.

Eligible participants will receive therapist-guided online cognitive behavior therapy over approximately seven weeks. This service is provided at no cost.

This is the first therapist-guided internet treatment for maternal depression offered in Canada and has been approved by the University of Regina, University of Saskatchewan, and the RQHR Research Ethics Boards.

FOR MORE INFORMATION
Contact: pugh200n@uregina.ca or 306.585.5369
WWW.ONLINETHERAPYUSER.CA
APPENDIX B. EDINBURGH POSTNATAL DEPRESSION SCALE (EPDS)\textsuperscript{16}

As you have recently had a baby, we would like to know how you are feeling. Please \underline{underline} the answer which comes closest to how you have felt \textbf{IN THE PAST 7 days, not just how you feel today.}

\textbf{In the Past 7 days:}
1. I have been able to laugh and see the funny side of things
   As much as I always could
   Not quite so much now
   Definitely not so much now
   Not at all

2. I have looked forward with enjoyment to things
   As much as I ever did
   Rather less than I used to
   Definitely less that I used to
   Hardly at all

3. I have blamed myself unnecessarily when things went wrong
   Yes, most of the time
   Yes, some of the time
   Not very often
   No, never

4. I have been anxious or worried for no good reason
   No, not at all
   Hardly ever
   Yes, sometimes
   Yes, very often

5. I have felt scared or panicky for no very good reason
   Yes, quite a lot
   Yes, sometimes
   No, not much
   No, not at all

6. Things have been getting on top of me
   Yes, most of the time I haven’t been able to cope at all
   Yes, sometimes I haven’t been coping as well as usual
   No, most of the time I have coped quite well
   No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping
   Yes, most of the time
   Yes, sometimes
   Not very often
   No, not at all

8. I have felt sad or miserable
   Yes, most of the time
   Yes, quite often
   Not very often
   No, not at all

9. I have been so unhappy that I have been crying
   Yes, most of the time
   Yes, quite often
   Only occasionally
   No, never

10. The thought of harming myself has occurred to me
    Yes, quite often
    Sometimes
    Hardly ever
    Never
APPENDIX C. DEPRESSION ANXIETY STRESS SCALE (DASS-21)\textsuperscript{17}

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

\textit{The rating scale is as follows:}

0 Did not apply to me at all  
1 Applied to me to some degree, or some of the time  
2 Applied to me to a considerable degree, or a good part of time  
3 Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I found it hard to wind down</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I was aware of dryness of my mouth</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>I couldn’t seem to experience any positive feeling at all</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>I experienced breathing difficulty (e.g., excessively rapid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>breathing, breathlessness in the absence of physical exertion)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I found it difficult to work up the initiative to do things</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>I tended to over-react to situations</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>I experienced trembling (e.g., in the hands)</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>I felt that I was using a lot of nervous energy</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>I was worried about situations in which I might panic and make</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>a fool of myself</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I felt that I had nothing to look forward to</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>I found myself getting agitated</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>I found it difficult to relax</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>I felt down-hearted and blue</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

\textsuperscript{17}From “The Structure of Negative Emotional States: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories,” by, P. F. Lovibond & S. H. Lovibond, 1995. In \textit{Behaviour Research and Therapy}, 33, 335-343.
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>15</td>
<td>I felt I was close to panic</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>16</td>
<td>I was unable to become enthusiastic about anything</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>17</td>
<td>I felt I wasn’t worth much as a person</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>18</td>
<td>I felt that I was rather touchy</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>19</td>
<td>I was aware of the action of my heart in the absence of physical exertion</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td></td>
<td>(eg, sense of heart rate increase, heart missing a beat)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>I felt scared without any good reason</td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>21</td>
<td>I felt that life was meaningless</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>
APPENDIX D. PARENTAL STRESS INDEX-SHORT FORM (PSI-SF)\textsuperscript{18}

The PSI Short Form Kit is available for purchase for $126.00 from Psychological Assessment Resources (http://www4.parinc.com/Products/Product.aspx?ProductID=PSI-SF). The kit includes the PSI Professional Manual and the PSI Short Form. This product is copyright protected and will not be included in this Appendix.

\textsuperscript{18}The Parenting Stress Index: Short Form (PSI/SF). Available from http://www4.parinc.com/Products/Product.aspx?ProductID=PSI-SF
APPENDIX E. WORLD HEALTH ORGANIZATION QUALITY OF LIFE ASSESSMENT BREF (WHOQOL-BREF)\textsuperscript{19}

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. Please choose the answer that appears most appropriate. If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life in the last four weeks.

<table>
<thead>
<tr>
<th></th>
<th>Very poor</th>
<th>Poor</th>
<th>Neither poor nor good</th>
<th>Good</th>
<th>Very good</th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>How would you rate your quality of life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>How satisfied are you with your health?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The following questions ask about how much you have experienced certain things in the last four weeks.

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>A moderate amount</th>
<th>Very much</th>
<th>An extreme amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>To what extent do you feel that physical pain prevents you from doing what you need to do?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>How much do you need any medical treatment</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

The following questions ask about how completely you experience or were able to do certain things in the **last four weeks**.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5. How much do you enjoy life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. To what extent do you feel your life to be meaningful?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. How well are you able to concentrate?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. How safe do you feel in your daily life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. How healthy is your physical environment?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<p>| | | | | |
|   |   |   |   |   |
|---|---|---|---|
| 10. Do you have enough energy for everyday life? | 1 | 2 | 3 | 4 |
| 11. Are you able to accept your bodily appearance? | 1 | 2 | 3 | 4 |
| 12. Have you enough money to meet your needs? | 1 | 2 | 3 | 4 |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Not at all</th>
<th>A little</th>
<th>Moderately</th>
<th>Mostly</th>
<th>Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>How available to you is the information that you need in your day-to-day life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14.</td>
<td>To what extent do you have the opportunity for leisure activities?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very poor</td>
<td>Poor</td>
<td>Neither poor nor good</td>
<td>Good</td>
<td>Very good</td>
</tr>
<tr>
<td>15.</td>
<td>How well are you able to get around?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very dissatisfied</td>
<td>Dissatisfied</td>
<td>Neither satisfied nor dissatisfied</td>
<td>Satisfied</td>
<td>Very satisfied</td>
</tr>
<tr>
<td>16.</td>
<td>How satisfied are you with your sleep?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17.</td>
<td>How satisfied are you with your ability to perform your daily living activities?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18.</td>
<td>How satisfied are you with your capacity for work?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19.</td>
<td>How satisfied are you with yourself?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.</td>
<td>How satisfied are you with your personal relationships?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21.</td>
<td>How satisfied are you with your sex life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
22. How satisfied are you with the support you get from your friends?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

23. How satisfied are you with the conditions of your living place?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

24. How satisfied are you with your access to health services?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

25. How satisfied are you with your transport?

<table>
<thead>
<tr>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

26. How often do you have negative feelings such as blue mood, despair, anxiety, depression?

<table>
<thead>
<tr>
<th>Never</th>
<th>Seldom</th>
<th>Quite often</th>
<th>Very often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
APPENDIX F. THE THERAPEUTIC ALLIANCE QUESTIONNAIRE (TAQ)\textsuperscript{20}

There are ways that a person may feel or react in relation to another person. Consider carefully your relationship with your therapist, and then place a score in the rating column (based on the scale below), according to how strongly you agree or disagree. Please score every one.

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating (0-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I found I was able to rely on my therapist.</td>
<td>________</td>
</tr>
<tr>
<td>2 I felt my therapist understood those concerns that were important to me.</td>
<td>________</td>
</tr>
<tr>
<td>3 I felt my therapist was helping me to achieve my goals.</td>
<td>________</td>
</tr>
<tr>
<td>4 My therapist and I worked well together throughout the treatment program.</td>
<td>________</td>
</tr>
<tr>
<td>5 I believe that my therapist and I viewed my concerns in a similar way.</td>
<td>________</td>
</tr>
<tr>
<td>6 I felt comfortable with my therapist’s ability to guide me through the program.</td>
<td>________</td>
</tr>
<tr>
<td>7 I believe that the techniques used in the program were beneficial.</td>
<td>________</td>
</tr>
<tr>
<td>8 I developed a respect for my therapist.</td>
<td>________</td>
</tr>
<tr>
<td>9 I felt that my therapist and I were able to communicate effectively.</td>
<td>________</td>
</tr>
<tr>
<td>10 Our communications seemed to slow my treatment progress.</td>
<td>________</td>
</tr>
<tr>
<td>11 I regarded my therapist’s view about me.</td>
<td>________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating (0-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I felt that I developed a good relationship with my therapist.</td>
<td></td>
</tr>
<tr>
<td>My therapist appeared to be competent in helping people.</td>
<td></td>
</tr>
<tr>
<td>I had meaningful communications with my therapist.</td>
<td></td>
</tr>
<tr>
<td>At times, I had fruitless exchanges with my therapist.</td>
<td></td>
</tr>
<tr>
<td>I believed the therapist respected me.</td>
<td></td>
</tr>
<tr>
<td>At times, I felt that my therapist appeared distant.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX G: THE TREATMENT SATISFACTION QUESTIONNAIRE (TSQ)\textsuperscript{21}

Part A:

Instructions: Using the scale shown in the box below, please rate ‘how useful’ you found the various treatment components to be.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>A little</td>
<td>Somewhat</td>
<td>Quite a lot</td>
<td>Very much so</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rating (0-7)

1. How useful did you find the information on postpartum depression?

2. How useful did you find the information regarding the available medical and psychological treatments for depression?

3. How useful did you find learning about the causes of depression?

4. How useful did you find developing your depression profile?

5. How useful did you find the activity planning exercises?

6. How useful did you find the problem solving exercises?

7. How useful did you find the relaxation exercises (e.g., mindful breathing, visualization)?

8. How useful did you find Cognitive Behaviour Therapy (CBT) for learning to change the way you think and feel?

9. How useful did you find the thought diary for identifying unhelpful thinking styles?

10. How useful was the five steps for problem solving (i.e., SOLVE)?

---

Part B:
Instructions: Using the scale shown in the box below, please rate ‘how much you personally liked’ the various treatment components.

<table>
<thead>
<tr>
<th>Rating (0-7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>Not at All</td>
</tr>
</tbody>
</table>

1. How much did you personally like the information postpartum depression? 

2. How much did you personally like learning about the available medical and psychological treatments for postpartum depression? 

3. How much did you personally like learning about the causes of postpartum depression? 

4. How much did you personally like developing your depression profile? 

5. How much did you personally like the mood monitoring exercise? 

6. How much did you personally like the activity planning exercises? 

7. How much did you personally like the problem solving exercises? 

8. How much did you personally like the relaxation exercises (e.g., mindful breathing, visualization)? 

9. How much did you personally like Cognitive Behaviour Therapy (CBT) for learning to change the way you think and feel? 

10. How much did you personally like the thought diary for identifying unhelpful thinking styles? 

11. How much did you personally like using the five steps for problem solving (i.e., SOLVE)? 

12. How much did you personally like planning and engaging in social activities?
**Part C:**

Instructions: Using the scale shown in the box below, please rate ‘how much you think you improved’ with respect to your depression symptoms.

<table>
<thead>
<tr>
<th>Rating (0-7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>Not at all</td>
</tr>
</tbody>
</table>

1. How much do you think you improved with respect to depression symptoms? ________
2. How much do you think you improved with respect to the frequency of your depressed mood symptoms? ________
3. How much do you think you improved with respect to the severity of your depressed mood? ________
4. How much do you think you improved with respect to identifying your negative thoughts and feelings? ________
5. How much do you think you improved with respect to your overall mood? ________

**Part D:**

Instructions: Using the scale shown in the box below, please rate how ‘your life has changed’ in the various areas described below.

<table>
<thead>
<tr>
<th>Rating (0-7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>Not at all</td>
</tr>
</tbody>
</table>

1. How do you think your life has improved with respect to your participation in leisure activities? ________
2. How do you think your life has improved with respect to your participation in family activities? ________
3. How do you think your life has improved with respect to your participation in job-related activities? ________
4. How do you think your life has improved with respect to your participation in social activities? ________
5. How do you think your life has improved with respect to your ability to be alone? ________
Part E:
Instructions: Using the scale provided, please rate the following treatment evaluation questions.

<table>
<thead>
<tr>
<th>Rating (0-7)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td></td>
<td>A little</td>
<td>Somewhat</td>
<td>Quite a lot</td>
<td>Very much so</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. How much did you like the treatment program? __________
2. How much did you enjoy communicating with your therapist? __________

General Comments:

1. What was the best part of the program? ______________________________________
2. What was the worst part of the program? ______________________________________
3. How could the program be improved? ______________________________________

Overall, how much improvement do you believe occurred, after completing the treatment program? (Please Circle)

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Improvement at All</td>
<td>Most Improvement Possible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. How many hours did you spend in total reading and re-reading the content in the Maternal Depression Online Program?

Please circle one

1-5 hours  6-11 hours  12-17 hours  17-23 hours  24-29 hours  30 hours or Over
APPENDIX H. CREDIBILITY/EXPECTANCY QUESTIONNAIRE (CEQ)\textsuperscript{22}

We would like you to indicate below how much you believe, \textit{right now}, that the therapy you are receiving will help to reduce your anxiety. Belief usually has two aspects to it: (1) what one \textit{thinks} will happen and (2) what one \textit{feels} will happen. Sometimes these are similar; sometimes they are different. Please answer the questions below. In the first set, answer in terms of what you \textit{think}. In the second set answer in terms of what you really and truly \textit{feel}. Your therapist will not see these ratings.

Set I

1. At this point, how logical does the therapy offered to you seem?

1 2 3 4 5 6 7 8 9
not at all logical somewhat logical very logical

2. At this point, how successfully do you think this treatment will be in reducing your depression symptoms?

1 2 3 4 5 6 7 8 9
not at all logical somewhat logical very logical

3. How confident would you be in recommending this treatment to a friend who experiences similar problems?

1 2 3 4 5 6 7 8 9
not at all logical somewhat logical very logical

4. By the end of the therapy period, how much improvement in your depressive symptoms do you think will occur?

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Set II

For this set, close your eyes for a few moments, and try to identify what you really feel about the therapy and its likely success. Then answer the following questions.

1. At this point, how much do you really feel that therapy will help you to reduce your depressive symptoms?

   1  2  3  4  5  6  7  8  9
   not at all  somewhat  very much

2. By the end of the therapy period, how much improvement in your anxiety symptoms do you really feel will occur?

   10%  20%  30%  40%  50%  60%  70%  80%  90%  100%
APPENDIX I. FOLLOW-UP INTERVIEW

1. Can you tell me about your overall experience with using Maternal Depression Online?

2. What did you find most helpful with Maternal Depression Online?

3. What did you find unhelpful with Maternal Depression Online?

4. What specific aspect of the program did you like the most?

5. What particular aspect of the program did you dislike the most?

6. How did you find the support you received once a week from your e-therapist?

7. Do you feel the program could be improved with a forum of other mothers that you could correspond with online through the program?

8. Do you think the program was as effective had you seen an in-person CBT therapist?

9. Would you recommend this program to a friend struggling with postpartum depression?

10. How did participation in the program impact your ability to parent your infant?
APPENDIX J. ETHICS APPROVAL DOCUMENTATION

University of Regina Research Ethics Board Approval

OFFICE OF RESEARCH SERVICES
MEMORANDUM

DATE: February 14, 2012

TO: Nicole Pugh
Psychology

FROM: Dr. Bruce Plouffe
Chair, Research Ethics Board

Re: A Randomized Controlled Trial of a Therapist-Assisted Internet Cognitive Behaviour Therapy Program for Women with Postpartum Depression (File # 4451112)

Please be advised that the University of Regina Research Ethics Board has reviewed your proposal and found it to be:

☐ 1. APPROVED AS SUBMITTED. Only applicants with this designation have ethical approval to proceed with their research as described in their applications. For research lasting more than one year (Section 1F), ETHICAL APPROVAL MUST BE RENEWED BY SUBMITTING A BRIEF STATUS REPORT EVERY TWELVE MONTHS. Approval will be revoked unless a satisfactory status report is received. Any substantive changes in methodology or instrumentation must also be approved prior to their implementation.

☐ 2. ACCEPTABLE SUBJECT TO MINOR CHANGES AND PRECAUTIONS (SEE ATTACHED). Changes must be submitted to the REB and approved prior to beginning research. Please submit a supplementary memo addressing the concerns to the Chair of the REB. ** Do not submit a new application. Once changes are deemed acceptable, ethical approval will be granted.

☐ 3. ACCEPTABLE SUBJECT TO CHANGES AND PRECAUTIONS (SEE ATTACHED). Changes must be submitted to the REB and approved prior to beginning research. Please submit a supplementary memo addressing the concerns to the Chair of the REB. ** Do not submit a new application. Once changes are deemed acceptable, ethical approval will be granted.

☐ 4. UNACCEPTABLE AS SUBMITTED. The proposal requires substantial additions or redesign. Please contact the Chair of the REB for advice on how the project proposal might be revised.

Dr. Bruce Plouffe

cc: Dr. Heather Hadjiistavropoulos - Psychology

** supplementary memo should be forwarded to the Chair of the Research Ethics Board at the Office of Research Services (Research and Innovation Centre, Room 523) or by e-mail to research.ethics@uregina.ca

Phone: (306) 585-4775
Fax: (306) 585-4893
www.uregina.ca/research
Regina Qu’appelle Health Region Research Ethics Board Approval

Certificate of Approval
Research Ethics Board

<table>
<thead>
<tr>
<th>PRINCIPAL INVESTIGATOR</th>
<th>Department of Psychology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. H. Hadjistavropoulos</td>
<td>University of Regina</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPROVAL DATE</th>
<th>A randomized controlled trial of a therapist-assisted internet cognitive behaviour therapy program for women with postpartum depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 19, 2012</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RQHR PROJECT #</th>
<th>APPROVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>REB-12-19</td>
<td></td>
</tr>
</tbody>
</table>

CERTIFICATION

The protocol and consent form for the above named project have been reviewed by the Chair of the Regina Qu’Appelle Health Region Research Ethics Board and the experimental procedures were found to be acceptable on ethical grounds for research involving human subjects.

The Regina Qu’Appelle Health Region Research Ethics Board meets the standards outlined by Canada’s Tri-Council Policy Statement for Ethical Conduct for Research Involving Humans.

The Regina Qu’Appelle Health Region Research Ethics Board has met the criteria for purposes of Section 29 of the Health Information Protection Act.

Please note that all future correspondence regarding this project must include the RQHR project number.

Best wishes in your continuing research endeavours.

Dr. Michelle McCarron, Acting Chair
Regina Qu’Appelle Health Region
Research Ethics Board

This Certificate of Approval is valid provided there is no change in the experimental procedures. Any significant changes to the protocol must be reported to the Chair for the Board’s consideration, in advance of implementation of such changes. You are required to provide a status report on an annual basis.
INTERNET THERAPY FOR POSTPARTUM DEPRESSION

University of Saskatchewan Research Ethics Board Approval

UNIVERSITY OF SASKATCHEWAN

Behavioural Research Ethics Board (Beh-REB)

Certificate of Approval

PRINCIPAL INVESTIGATOR
Heather Hadjistavropoulos

DEPARTMENT
Off-campus

INSTITUTION(S) WHERE RESEARCH WILL BE CONDUCTED
University of Regina
3737 Wascana Parkway
Saskatoon SK

STUDENT RESEARCHER(S)
Nicole Pugh

FUNDER(S)
CANADIAN INSTITUTES OF HEALTH RESEARCH (CIHR)

TITLE
A Randomized Controlled Trial of a Therapist-Assisted Internet Cognitive Behaviour Therapy Program for Women with Postpartum Depression

ORIGINAL REVIEW DATE
15-Mar-2012

APPROVAL ON
25-May-2012

APPROVAL OF:
Application for Approval of Research Procedures

EXPIRY DATE
24-May-2013

Full Board Meeting ☒ Date of Full Board Meeting: 15-Mar-2012
Delegated Review ☐

CERTIFICATION
The University of Saskatchewan Behavioural Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol or consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: http://www.usask.ca/research/ethics_review/

John Rigby, Chair
University of Saskatchewan
Behavioural Research Ethics Board
APPENDIX K. THE MINI-INTERNATIONAL NEUROPSYCHIATRIC INTERVIEW (MINI)\textsuperscript{23}

The M.I.N.I. 6.0 is available for purchase to students for a one-time fee of $19.95. The produce is available from Medical Outcome Systems, Inc (https://www.medical-outcomes.com/index.php). This product is copyright protected and will not be included in this Appendix.

APPENDIX L. DEMOGRAPHIC QUESTIONS

Demographic Data

Client Name:  Date of Birth (DD/MM/YYYY)

Address:  Appt #:

City:  Postal Code:

Phone No.: (home)  Can we contact you by: (Y or N)

(work)  Phone _______  Letter_____

(other)  Leave Message____  Email_____

Phone No. during the day:

Health Card No.:

Date of Screening:

Are you currently on any medication for any of the problems that I asked you about today?

☐ Yes (List medications) __________________________________________________________

..................................................................................................................

..................................................................................................................

..................................................................................................................

☐ No

If ‘YES’: For how long have you been taking the medication? ________________________

..................................................................................................................

When did you last have a change in the dosage? _________________________________

..................................................................................................................

(If less than 1 month: inform the person that we will need to wait until the medication has been stabilized for 1 month)
Will you inform us if your medication changes or if you begin a new medication?  
☐ Yes  ☐ No

Are you currently in (psychological) treatment for any of the problems that I asked about today?  ☐ Yes  ☐ No

Will you tell us if you begin treatment for any of the problems that I asked you about today?  ☐ Yes  ☐ No

Have you previously been in treatment for any of the problems that I asked about today?  ☐ Yes  ☐ No

If ‘Yes’, when? ______________________________________________________________________

What kind of therapy was it? ______________________________________________________________________

Do you have involvement with other agencies:  (Addiction Services, Crisis Services,  
RCMP, Social Services) ______________________________________________________________________

Do you have any illnesses or medical conditions? (List below) ______________________

Is there a possibility that this/these could interfere with your ability to participate in this 
Online Therapy USER program?  ☐ Yes  ☐ No

In order to provide some background information to your therapist, can I ask you a few 
personal questions?

Personal History:

Ethnicity: ______________________________________________________________________

Marital Status: ______________________________________________________________________

Spouse/Partner ______________________________________________________________________

Significant Other: ______________________________________________________________________

Length of relationship: ______________________________________________________________________

Spouse Age: ______________________________________________________________________

Spouse Occupation: ______________________________________________________________________
Spousal or partner problems: 

Will your partner know that you are participating?  ☐ Yes  ☐ No

Children: (names, ages, sex)

Vaginal Delivery: ☐ Yes  ☐ No

Breastfeed: ☐ Yes  ☐ No

Twin Births: ☐ Yes  ☐ No

Problems:

Family Psychiatric/Medical History (e.g. Depression, Addictions etc.)

Abuse Within/Outside the Family (e.g. Sexual, Physical, Verbal, Emotional)

Who do you turn to for support?

Occupation: ___________________________  Employer ___________________________

How long have you done this? ___________________________ months / years

Living Arrangement:  ☐ Alone  ☐ With Family  ☐ With Friends  ☐ Other:

Are you facing any current legal difficulties right now?: ___________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Medical History:

Prescription Drugs: ________________________________________________

______________________________________________________________

Non-Prescription Drugs: __________________________________________

______________________________________________________________

Addictions:

Tobacco Use: ____________________________________________________

Alcohol Use: _____________________________________________________

Illicit Drugs: ____________________________________________________

Gambling: _______________________________________________________  

Treatment: ______________________________________________________

______________________________________________________________

Thanks for answering these questions.

Do you have any questions for me?
Are you enjoying pregnancy or being the mother of a new baby?  
If you answered “no” to this question, you might be depressed.

Having several of the following symptoms for more than two weeks could mean you are depressed ...
- Less interest in things you usually like
- Crying for no reason
- Irritable, angry, or more sensitive
- More tired or hyper
- Not sleeping or sleeping too much
- Problems concentrating
- Not able to cope
- Anxious or panicked
- Thoughts of harming yourself, your baby, or others

If you think you might be depressed, talk to someone, ask for help.

For help, contact:
- A health care professional – your doctor, nurse, or midwife
- Healthline: 1-877-800-0002

Depression is treatable and there is help!  
www.skmaternalmentalhealth.ca

Taking Care of You
- Be kind to yourself
- Ask for and accept help with baby and housework
- Keep active... go for a walk
- Get enough sleep - at least 6 hours in a 24 hour period
- Eat healthy and regularly
- Avoid alcohol, tobacco, and other drugs
- Take medications as prescribed
- Try yoga or other activities to help you relax
- Look for a support group or other supports in your community
- Talk to a health care provider

Partners, family, and friends, you can also help ...
- Listen to her and support her feelings
- Ask her how you can help
- Encourage her to seek professional help
- Develop a relationship with your baby
- Educate yourself about maternal mental health

Partners can also experience depression ...
- it is important that they also get the support they need.

For more information, visit the following websites:
Saskatchewan Maternal Mental Health  
www.skmaternalmentalhealth.ca
Best Start Resource Centre  
www.lifewithnewbaby.ca

For information about medication use in pregnancy and while breastfeeding:  
Saskatchewan Drug Information Services  
1-800-655-DRUG (3784)

APPENDIX N. INFORMATION PAGE AND CONSENT FORM FOR WAITLIST CONTROL PARTICIPANTS

Information Page

Please take the time to carefully read the following information. If any of the presented information is unclear, please e-mail the Principle Investigator, Nicole Pugh, at pugh200m@uregina.ca, for clarification. You may also phone her at 337-3331. If you understand and accept the terms and conditions of the Online Therapy USER program, your informed consent will be required before you can participate. The consent form is located at the end of this document.

Project Title: A Randomized Controlled Trial of a Therapist-Assisted Online Therapy Program for Women with Postpartum Depression

Background: Previous research has shown that therapist-guided Online Cognitive Behaviour Therapy (online-CBT) can be used to effectively treat major depression and anxiety. Such services have not been consistently available in Canada to date. Further, research has not investigated treating postpartum depression through online-CBT. The Online Therapy Unit has since adapted online-CBT programs that were developed and tested by a team in Australia for use in Saskatchewan. The current research project has adapted the online-CBT program for depression to specifically treat women with postpartum depression. This study will test how effective this program is in treating women with postpartum depression.

Procedure: To test the effectiveness of this program, participants will be randomly assigned to one of two groups: Online-CBT or Pamphlet Waitlist. You have been randomly assigned to the pamphlet Waitlist group. You will receive a pamphlet that is offered by to pregnant and postpartum women around Saskatchewan. This pamphlet provides strategies to help manage depressive symptoms and contact numbers and websites of postnatal support services offered in Saskatchewan. You will be offered online-CBT in approximately 10-weeks.

Questionnaires: You will be asked to complete questionnaires about your levels of depression, anxiety, general and parental stress, and quality of life on two different occasions: once when the study begins and then again 10-weeks later. These questionnaires are linked to this website and will take approximately 15-30 minutes to
complete. After you finish reading this information page and provide consent to participate, you will be taken to the first set of questionnaires.

**Time 2 Questionnaires / Phone Call:** After you complete the first set of questionnaires, your responses will be submitted to the researcher. After ten weeks, the researcher will e-mail and/or phone you to ask you to complete the same online questionnaires for a second time. This will help us to determine how you are feeling and whether your mood or other symptoms have changed over this 10-week period. You will also receive a phone call from the researcher that will involve a mini-assessment of your anxiety symptoms. This phone call will take approximately 15 minutes of your time.

**Online-CBT:** After you complete the second set of questionnaires and mini-phone assessment, you will be offered the opportunity to receive Online-CBT, which is designed to take 7-10 weeks. At this time, you will be assigned an online therapist and provided with a username and password for the onlinetherapyuser.ca website.

**Voluntary Participation:** Participation in this study is voluntary. Should you choose not to participate, or if you wish to withdraw from the study at any time after starting, you may do so without any consequences to your present or future healthcare.

**Confidentiality:** Only the researchers who are involved in this project will know of your participation. Your responses to the questionnaires, along with the responses of other participants, will be accessed only by the primary researcher, Nicole Pugh. Your name and other identifying information will not be associated with any of your responses, so the researcher will not be aware of your identity when examining information from the questionnaires.

**Confidentiality and Internet Surveys:** There is a very small chance that your privacy may not be guaranteed by participating in this online study. Descriptions of the risks are listed below:

a. In order to protect the integrity of the study and to prevent multiple submissions from the same source, this survey will record your computer’s Internet address. All Internet Service Providers assign an identification number to every computer. This number will be temporarily stored in a file until the research is completed. After completion of the research, the primary researcher will delete the entire file. The researcher will not have access to this information, and it will not be used to identify individuals.

b. When submitting your survey answers via the Internet, there is a small possibility your information will be intercepted by unauthorized third parties using sophisticated tools. It should be noted that this rarely occurs and is a risk that can occur at any time, not just with online surveys, when using a computer connected to the Internet.
c. Any computer connected to the Internet will store information about visited websites on the Internet browser’s history list and its disk cache. The responses to this survey are only temporarily store on your computer until you close down your browser window. In other words, after you complete and submit your survey, your computer will automatically delete this information. You may also delete the information by clearing your history list and disk cache.

d. After completion of your survey, the information will be sent directly to the survey software website. The information will then be sent to a private folder that is only accessible by the primary researcher. All responses will be downloaded at the completion of the study and then kept in a secure location by the researcher. The information will not be linked to your Internet address.

**Storage of Research Information:** Responses to questionnaires will be kept in a computer file. This file will not contain any identifying information. This file will be available to the research team; however, individual information is confidential.

- For research purposes, scores from any questionnaires you respond to will be summarized across all participants, so that individual responses will not be linked to a specific person in any publication of our results. Therefore, you as an individual will not be identifiable.

- Any details that could potentially reveal your identity will be excluded from discussions, study reports, and presentations.

- All information collected for this study will be kept in a locked office at the University of Regina and held for 5 years

**Possible Benefits & Risks:** There are no anticipated risks associated with this online battery of questionnaires. The only cost to you will be the time required to complete the questionnaires and the mini-assessment by phone at the end of the study. This research may help women to address their postpartum depression. Further, if the treatment program is found to be effective, it may help other women who experience postpartum depression.

**Questions and Contact Information:** Please feel free to contact any of the researchers if you have any additional questions about the procedures or purpose of this research.

- If you have questions about this study, feel free to e-mail the researcher, Nicole Pugh, at pugh200n@uregina.ca or call (306) 585-5369.

- You may also contact her research supervisor, Dr. Heather Hadjistavropoulos, at Heather.Hadjistavropoulos@uregina.ca or call (306) 585-5133.
Ethics Approval: This research project has been approved on ethical grounds by the Research Ethics Boards (REBs) of the University of Regina, the University of Saskatchewan, the Regina Qu’Appelle Health Region (RQHR), the Cypress Health Region, the Five Hills Health Region, the Sun Country Health Region, and the Sunrise Health Region. Any questions regarding your rights as a participant may be addressed to that committee through the University of Regina Ethics Board at (306) 585-4775 or email: research.ethics@uregina.ca. Out of town participants may call collect.

Access to Study Results: A summary of this study’s results will be posted on this website (www.onlinetherapyuser.ca) once all data have been collected and analyzed. This will likely take over a year. If you have any further questions about the research findings, please feel free to contact the Online Therapy Unit using the information listed below:

Nicole Pugh
Department of Psychology
University of Regina
3737 Wascana Parkway
Regina, SK S4S 0A2
Ph: (306) 585-5369
E-mail: pugh200n@uregina.ca
Consent Form

**Project Title:** A Randomized Controlled Trial of a Therapist-Assisted Online Therapy Program for Women with Postpartum Depression

I, the Participant, state the following:

1. I am 18 years of age or older  **Yes  No**

2. I have read the Information Page and have had any questions answered to my satisfaction.  **Yes  No**

3. I am aware that I can contact the research team through Nicole Pugh, at pugh200n@uregina.ca or call (306) 337-3331.  **Yes  No**

4. This research project has been approved on ethical grounds by the Research Ethics Boards (REBs) of the University of Regina, the University of Saskatchewan, the Regina Qu’Appelle Health Region (RQHR), the Cypress Health Region, the Five Hills Health Region, the Sun Country Health Region, and the Sunrise Health Region. I am aware that any questions regarding my rights as a participant may be addressed to that committee through the University of Regina Ethics Board at (306) 585-4775 or email: research.ethics@uregina.ca. Out of town participants may call collect.  **Yes  No**

5. I understand that my participation is voluntary and that I am free to withdraw at any time.  **Yes  No**

**Do you freely and voluntarily consent to take part in this research study?**
**That is, do you consent to receive online-CBT and routinely complete outcome assessments pre-treatment and post-treatment?**

**Yes  No**
APPENDIX O. TREATMENT QUESTIONS ADMINISTERED TO THE WAITLIST GROUP

During the 10-week period, did you seek any of the following services?

1. Treatment from a medical doctor (e.g., general practitioner)?  
   □ Yes  □ No  
   • If yes, approximately how many appointments? _____  
   • Were the appointments specifically related to Postpartum Depression?  
     □ Yes  □ No

2. Treatment from a psychologist or mental healthcare worker?  
   □ Yes  □ No  
   • If yes, how many sessions did you receive? _____  
   • Were the sessions private or publically covered? □ Private  □ Public

3. Treatment from a support group?  
   □ Yes  □ No  
   • If yes, what was the support group for (Postpartum Depression, Mother Support group)? ______________

4. Begin a psychotropic medication (e.g., antidepressant, antianxiety)?  
   □ Yes  □ No  
   • If yes, what medication did you take?______________  
   • What was the dosage of this medication?__________  
   • For how long did you take the medication? ________(months)

5. Begin taking naturopathic medicine (e.g., vitamins)?  
   □ Yes  □ No

6. Receive naturopathic or homeopathic procedures (e.g., acupuncture)?  
   □ Yes  □ No

7. Access other treatments for Postpartum Depression?  
   □ Yes  □ No  
   • If yes, please explain:____________________________

8. Access the Saskatchewan Maternal Mental Health website?  
   □ Yes  □ No
# APPENDIX P. COMPARISON OF DEPRESSION ONLINE TO MATERNAL DEPRESSION ONLINE

<table>
<thead>
<tr>
<th>Session Number</th>
<th>Depression Online</th>
<th>Maternal Depression Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Introduction</strong></td>
<td><strong>Introduction</strong></td>
</tr>
<tr>
<td></td>
<td>- Introduction to the purpose/content of <em>Depression Online</em></td>
<td>- Introduction to the purpose/content of <em>Maternal Depression Online</em>; Recognize the effort mothers have made to participate</td>
</tr>
<tr>
<td></td>
<td>- Psycho-education:</td>
<td>- Psycho-education:</td>
</tr>
<tr>
<td></td>
<td>- What is Major Depression?</td>
<td>- What is PPD?</td>
</tr>
<tr>
<td></td>
<td>- Different treatment options for Major Depression</td>
<td>- The transition into motherhood (i.e., adapting to physical, emotional, and social changes)</td>
</tr>
<tr>
<td></td>
<td>- Predisposing/Precipitating/Protective Factors</td>
<td>- Predisposing/Precipitating/Protective Factors</td>
</tr>
<tr>
<td></td>
<td>- Introduction to the cognitive-behavioural approach to treat Major Depression</td>
<td>- Introduction to the cognitive-behavioural approach to treat PPD</td>
</tr>
<tr>
<td></td>
<td>- An introduction to monitoring your mood</td>
<td>- An introduction to monitoring your mood</td>
</tr>
<tr>
<td></td>
<td>- Homework: Depression Profile</td>
<td>- Homework: PPD Profile</td>
</tr>
<tr>
<td>2</td>
<td><strong>Activity Planning: Getting the Balance Right</strong></td>
<td><strong>Pleasant Activities: How can I find the time?</strong></td>
</tr>
<tr>
<td></td>
<td>- Psycho-education:</td>
<td>- Psycho-education:</td>
</tr>
<tr>
<td></td>
<td>- Pleasant activities and depression</td>
<td>- Pleasant activities and depression (pleasurable activities that are enjoyable for the mother as an individual, as well as for the mother and her baby, and the mother and her partner)</td>
</tr>
<tr>
<td></td>
<td>- Activity planning strategies</td>
<td>- Goal setting and steps for activity planning with an infant (e.g., going to a friend’s house who also has a child rather than staying home alone)</td>
</tr>
<tr>
<td></td>
<td>- Benefits of physical activity</td>
<td>- Homework: Engage in activity planning and pleasant activities</td>
</tr>
<tr>
<td></td>
<td>- Barriers of physical activity</td>
<td>- Homework: Engage in activity planning and pleasant activities</td>
</tr>
<tr>
<td></td>
<td>- Goal setting and steps for activity planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Homework: Engage in activity planning and pleasant activities</td>
<td></td>
</tr>
<tr>
<td>Session Number</td>
<td>Depression Online</td>
<td>Maternal Depression Online</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------</td>
<td>---------------------------</td>
</tr>
</tbody>
</table>
| 3              | Exercise and Nutrition  
- Psycho-education:  
  - Lifestyle changes that improve mood  
  - Healthy eating for improved mood  
  - Exercise to enhance mood  
- Homework: Monitor eating habits and complete physical activity worksheet | Relaxation on the Run  
- Psycho-education:  
  - The connection between anxiety and depression  
  - Relaxation exercises (slow breathing, progressive muscle relaxation, visual imagery)  
  - Address the feelings of guilt some women experience when they allow themselves to do something just for themselves  
  - Relaxation on the run (techniques that can be used quickly in specific problem situations) and during high tension times (e.g., 5-7pm dinner time; getting baby to sleep; tantrums in the supermarket).  
- Homework: Practice relaxation techniques and continue to incorporate pleasurable activities into daily life |
| 4              | Relaxation  
- Psycho-education:  
  - The connection between anxiety and depression  
  - The triangle of health (healthy eating, relaxation, exercise)  
  - Relaxation exercises (slow breathing, progressive muscle relaxation, visual imagery)  
  - Mindfulness breathing and meditation  
- Homework: Practice a relaxation technique at least three times during the week | Thinking Styles  
- Psycho-education:  
  - Description of Cognitive Behaviour Therapy  
  - How depression affects thinking  
  - The role of perfectionism in depression (e.g., “mother knows best. No one can care for my baby well enough”)  
  - How to monitor unhelpful thinking  
- Homework: Record thoughts that come to mind when feeling flat or depressed |
<table>
<thead>
<tr>
<th>Session Number</th>
<th>Depression Online</th>
<th>Maternal Depression Online</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Improving Sleep</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Psycho-education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The relationship between poor sleep and depression;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How lifestyle and environmental factors impact sleep</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Introduction to a sleep diary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Homework: ½ hour walks three times during the week; start a sleep diary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thinking Styles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Psycho-education:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Unhelpful thinking styles (e.g., catastrophising-“getting up in the morning is too hard, there is an impossible amount of things to do for my infant and partner”)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Strategies for challenging unhelpful thoughts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strategies to challenge unhelpful beliefs and assumptions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Homework: Identify/challenge negative thinking; Identify/challenge negative assumptions and beliefs</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Thinking Styles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Psycho-education:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cognitive Behaviour Therapy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How depression affects thinking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The role of perfectionism in depression</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How to monitor unhelpful thinking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Homework: Record thoughts that come to mind when feeling flat or depressed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Problem Solving</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Psycho-education:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Poor problem solving skills and depression</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 5 steps to effective problem solving</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Homework: Fill-in and try to implement the problem solving solution</td>
<td></td>
</tr>
<tr>
<td>Session Number</td>
<td>Depression Online</td>
<td>Maternal Depression Online</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>7</td>
<td><strong>Thinking Styles</strong>&lt;br&gt;-Psycho-education:&lt;br&gt;  - Unhelpful thinking styles&lt;br&gt;  - Strategies for challenging unhelpful thoughts&lt;br&gt;  - Strategies to challenge unhelpful beliefs and assumptions&lt;br&gt;-Homework: Identify/challenge negative thinking; Identify/challenge negative assumptions and beliefs</td>
<td><strong>Putting it all together- travelling on</strong>&lt;br&gt;- Psycho-education:&lt;br&gt;  - Maintaining gains&lt;br&gt;  - The role of social support (family/friends) that can be of assistance to mothers. Generate a list of contacts.&lt;br&gt;  - Identification of and preparation for high-risk situations&lt;br&gt;    - Draw upon skills to address these situations&lt;br&gt;  - Generalization training- present novel situations that are similar to those previously discussed and generalize the skills to these situations.&lt;br&gt;-Identifying future goals&lt;br&gt;- Summary of the program and information on how the strategies work together.</td>
</tr>
<tr>
<td>8</td>
<td><strong>Problem Solving</strong>&lt;br&gt;- Psycho-education:&lt;br&gt;  - Poor problem solving skills and depression&lt;br&gt;  - 5 steps to effective problem solving&lt;br&gt;-Homework: Fill-in and try to implement the problem solving solution</td>
<td></td>
</tr>
<tr>
<td>Session Number</td>
<td>Depression Online</td>
<td>Maternal Depression Online</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------</td>
<td>---------------------------</td>
</tr>
</tbody>
</table>
| 9              | *Relationships and Social Support*  
- Psycho-education:  
  - The importance of relationships, social connection, and support  
  - Strategies to increase social interaction  
  - Strategies on how to communicate effectively and how to manage anger  
- Homework: Plan social activities; Challenge negative thoughts; use problem solving techniques | |
| 10             | *Mindfulness*  
- Psycho-education:  
  - Introduction to mindfulness and how it is important to treatment recovery  
  - Techniques for practicing mindfulness;  
  - Strategies to incorporate mindfulness into everyday life  
- Homework: Practice at least two mindfulness exercises during the week | |
| 11             | *Relapse Prevention*  
- Practical strategies for overcoming future episodes of depression  
- Core strategies for prevention depression relapse  
- The development of a depression management plan  
- Homework: Try the time management skills; Complete the depression management plan | |

**INTERNET THERAPY FOR POSTPARTUM DEPRESSION**
<table>
<thead>
<tr>
<th>Session Number</th>
<th>Depression Online</th>
<th>Maternal Depression Online</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Program Overview</strong></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>-Summary of the treatment modules</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Summary of the strategies that will help manage and treat future depressive episodes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-Information on how the strategies work together</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX Q: PHYSICIAN NOTIFICATION FORM

Date:

Dr. XX
XX Medical Clinic
Address

RE: Notification of client participation in the Online Therapy USER Program

Dear Dr. XX,

I am writing to inform you that your patient XX (DOB XX; Health Card Number XX) is participating in Maternal Depression Online and has provided your name as a contact in case of emergency.

The Online Therapy Unit is a new online mental health unit that allows trained therapists to provide Online Cognitive Behavior Therapy (Online-CBT) to residents of Southern Saskatchewan who have difficulties with maternal depression, major depression, generalized anxiety, and/or panic. Online-CBT involves helping clients learn how to identify and make changes to problematic thoughts (cognitions) and actions (behaviours). Clients who are screened to be appropriate for this service review educational material online (typically for a period of 7-12 weeks) and correspond with their therapist over a secure e-mail system. Online-CBT has been found to be effective and has many advantages including being more available, convenient and efficient than CBT delivered in person. If you are interested you can review our website at www.onlinetherapyuser.ca

If you have any concerns about this patient participating in treatment, please call us. Reasons for non-participation might include, but are not limited to:

1) the patient is not 18 years of age
2) the patient is at risk of suicide
3) the patient suffers from problems with alcohol or drugs
4) the patient suffers from psychotic symptoms
5) the patient suffers from mania

If you have any questions, please call the Online Therapy Unit at (306) 585-5369 or contact Dr. Heather Hadjistavropoulos at (306) 585-5133.

Sincerely,

Nicole Pugh, M.A.
Coordinator of Maternal Depression Online
APPENDIX R. LATTICE PLOTS OF INDIVIDUALS’ EPDS TOTAL OVER TIME (WEEKS)

With Simple Linear Regression Lines Plotted to Indicate Trajectories over Time

Legend: Treatment Group in Purple and Waitlist in Blue. ID indicated by Orange Vertical Bars.

Overall, compared to the Waitlist Group cases, the Treatment Group cases tend to have the smaller slopes (larger in magnitude negative slopes) indicating a larger decrease in EPDS Total and larger improvement in these clients’ health, as born out in the Mixed Models analysis.

(Please note: 45 cases are shown in the lattice plot above. 5 cases are not shown because simple linear regressions could be not be fit. All cases were used in the Mixed Models.)
**APPENDIX S. MULTILEVEL MODEL INCLUDING SEVERE CASE**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Std. Error</th>
<th>Df</th>
<th>t</th>
<th>p</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1: EPDS-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>15.65</td>
<td>.65</td>
<td>47.54</td>
<td>24.18</td>
<td>.000</td>
<td>14.35</td>
<td>16.96</td>
</tr>
<tr>
<td>Week</td>
<td>-.26</td>
<td>.06</td>
<td>20.84</td>
<td>-4.12</td>
<td>.70</td>
<td>.39</td>
<td>.13</td>
</tr>
<tr>
<td>Tx</td>
<td>.25</td>
<td>.90</td>
<td>46.65</td>
<td>.27</td>
<td>.79</td>
<td>-1.56</td>
<td>2.06</td>
</tr>
<tr>
<td>Severe case</td>
<td>7.63</td>
<td>2.96</td>
<td>42.26</td>
<td>2.58</td>
<td>0.007</td>
<td>1.67</td>
<td>13.59</td>
</tr>
<tr>
<td>Interaction (Week * Tx)</td>
<td>-.18</td>
<td>.077</td>
<td>12.23</td>
<td>-2.32</td>
<td>.019</td>
<td>-.35</td>
<td>-.01</td>
</tr>
</tbody>
</table>

*Note. Dependent variable = EPDS Baseline; Week = time measured in weeks; Df = degrees of freedom; Tx = treatment, 0 for WLC and 1 for TAICBT; p values for week and interaction are 1-tailed.*