Patient-initiated Strategies for Self-management of Depression and Low Mood: Understanding Theory and Changing Behaviour

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Abstract

Background: Depression is a major health concern and self-management of depressive symptoms using patient-initiated strategies has the potential to reduce the burden of this condition. A better understanding of behaviour change related to these patient-initiated strategies is needed.

Method: This randomized controlled trial study used an online survey and Knowledge Translation and Transfer theory-based educational intervention to examine the Theory of Planned Behavior model in the context of nine patient-initiated strategies for the self-management of depression and low mood.

Results: Perceived Behavioural Control was identified as the single greatest predictor of Intentions to engage in strategies. Attitudes predicted Intentions to a lesser degree. Subjective Norms were not identified as unique predictors. Theory of Planned Behavior antecedent variables together explained over one third of the variance in Intentions. Intentions to engage in patient-initiated strategies were shown, in some cases, to significantly predict actual engagement in strategies. Level of depressive symptoms did not meaningfully impact any of the antecedent variables or Intentions. Results also suggest that an educational intervention based on Knowledge Translation and Knowledge Transfer principles significantly improved both Attitudes and Subjective Norms – Physician towards patient-initiated strategies. Perceived Behavioural Control and Intentions were not improved as a result of the educational intervention.

Theoretical Conclusions: Findings suggest that the Theory of Planned Behavior functions well in the context of patient-initiated strategies for depression and low mood. Perceived Behavioural Control was identified as the greatest predictor of Intentions to engage in patient-initiated strategies. Results also suggest mood difficulties are not captured by the model's antecedent

variables but instead should be included as an additional variable in this model. The findings of the current study support an integrated model of Knowledge Translation and Transfer and Theory of Planned Behavior.

Practical Conclusions: The current study's findings provide a better understanding of behaviour change in the context of patient-initiated strategies and will help guide interventions aimed at improving engagement in these behaviours. Findings also provide support and recommendations for the use of Knowledge Translation and Transfer theory-based educational interventions to improve self-management of depression and low mood.

Patient-initiated Strategies for Self-management of Depression and Low Mood: Understanding Theory and Changing Behaviour

Introduction

Context

Depression has been identified by the World Health Organization as the single greatest cause of disease burden in the Western world (World Health Organization, 2004). In primary care settings, where the majority of depression cases are managed (Griffiths & Christensen, 2008), less than half of patients experiencing clinically significant levels of depressive symptoms are identified by general practitioners as having Major Depressive Disorder (Mitchell, Vaze, & Rao, 2009) and less than 60% of identified cases are provided with appropriate treatment (Craven & Bland, 2013; Pence, O'Donnell, & Gaynes, 2012). Various systemic limitations explain these oversights but they are ultimately due to the overburdening of the primary care system (Margolius & Bodenheimer, 2010). Patient self-management of depressive symptoms using empirically-based, patient-initiated strategies (Jorm, Christensen, Griffiths, & Rodgers, 2002), is an integral, cost effective component of successful stepped-care models (Richards, 2012) and a potential solution to the growing problem of depression in Canada. The challenge lies in understanding patients' attitudes and beliefs towards patient-initiated strategies and developing interventions that most effectively improve behavioural intentions and actual engagement in self-management of depressive symptoms. Using the Theory of Planned Behavior (TPB; Ajzen, 1991), the current study aims to understand patient attitudes and beliefs towards nine patient-initiated strategies and the effect of a Knowledge Translation and Knowledge Transfer theory-based educational intervention.

Background

Depression

Depression is a major health concern responsible for widespread impairment and diminished quality of life (Kessler, Merikangas, & Wang, 2007). Characterized principally by depressed mood and loss of interest in previously enjoyed activities, major depressive episodes can also include problematic changes in appetite and weight, increased fatigue, disrupted sleep routines, difficulties with concentration, physical agitation or slowed psychomotor functioning, feelings of worthlessness or guilt, and suicidal ideation or behaviour (APA, 2000). Major depressive episodes of moderate to severe intensity range from five to nine months in duration with more mild presentations generally enduring for longer periods (Furukawa, Konno, Morinobu, Harai, Kitamura, & Takahashi, 2000). Of those experiencing clinically significant severity of depressive symptoms, 41% are described as "severely depressed" and typically endorse most of the DSM-IV-TR criterion (Carragher, Adamson, Bunting, & McCann, 2009). Thirty-one percent of depressed individuals are described as "psychosomatic" and are most likely to endorse appetite and sleep disturbances as well as impaired concentration. The remainder are identified as "cognitive-emotional" (10.2%), exhibiting symptoms related to worthlessness, guilt, impaired concentration, and suicidality, or "non-depressed" (18.3%), endorsing few DSM-IV-TR symptoms (Carragher et al., 2009).

Estimates of lifetime prevalence rates are 12.2% in Canada (Patten et al., 2006) and 16.6% in the United States (Kessler et al., 2007) with a recent meta-analysis of depression epidemiology worldwide (Ferrari et al., 2012) suggesting increasing rates of prevalence in most Western countries. One-year incidence of depression in Canada was estimated at 2.7% with cumulative incidence in years two and three estimated at 5.7% and 7.2%, respectively (Wang,

Williams, Lavorato, Schmitz, Dewa, & Patten, 2010). According to the Global Burden of Disease, Injuries, and Risk Factors Study (Murray & Lopez, 1996), depression in 1990 accounted for 3.7% of disability-adjusted life years (DALYs), a measure incorporating the number of years of life lost due to premature death and the number of years lived with a disability. In 2000, the burden of depression had increased to account for 4.3% of DALYs making it the third greatest contributor to burden and the leading cause of disability (Üstün , Ayuso-Mateos, Chatterji, Mathers, & Murray, 2004). A later analysis by the World Health Organization suggests that depression is now the leading cause of burden in the Western world (World Health Organization, 2004).

Depression in isolation has proven to be a significant health concern but its common comorbidity with other medical and psychological conditions produces compounding effects in many areas of health. Ninety three percent of individuals with depression have at least one comorbid medical or psychological condition with the average depressed individual experiencing four other conditions (Gadermann, Alonso, Vilagut, Zaslavsky, & Kessler, 2012). The Canadian Network for Mood and Anxiety Strategies (CANMAT) identified several common comorbid physical conditions, including cardiovascular disease, cerebrovascular disease, cancer, human immunodeficiency virus, hepatitis C virus, migraine, multiple sclerosis, epilepsy, and osteoporosis, all of which are adversely affected by depressive symptoms. Rates of depression comorbidity range from 20% and 25% in cardiovascular disease (Thombs et al., 2005; Thombs et al., 2008) and cancer (Pirl, 2004), respectively, to as much as 42% and 50% in migraines (Breslau, Lipton, Stewart, Schultz, & Welch, 2003) and multiple sclerosis (Skokou, Soubasi, & Gourzis, 2012), respectively. If untreated, co-occurring depression in these medical conditions can significantly compromise prognoses and even increase the likelihood of death (CANMAT,

2012). A high rate of comorbidity is also observed between depression and other mental illnesses (Rohde, Lewinsohn, & Seeley, 1991). For example, 63% of individuals with anxiety also have depression (Lamers et al., 2011), half of those diagnosed with schizophrenia have co-occurring depressive symptoms (Buckley, Miller, Lehrer, & Castle, 2009), and over 27% of individuals with substance abuse also have a diagnosis of major depressive disorder (Cerda, Sagdeo, & Galea, 2008).

Depression experienced on its own or coupled with medical and other psychological conditions is a significant and mounting health care concern (Üstün et al., 2004) requiring effective, evidence-based treatment at all levels of health care (e.g., Kennedy, Lam, Cohen, Ravindran, et al., 2001; Segal, Whitney, Raymond, et al., 2001). Current treatments of depression not only reduce depressive symptoms (e.g., Forman, Shaw, Goetter, Herbert, & Park, 2012), they have also been shown to improve clinical outcomes of co-occurring medical and psychological conditions including, for example, cancer (Miovic & Block, 2007; Reich, Lesur, & Perdrizet-Chevallier, 2008; Sheard & Maguire, 1999), diabetes (Katon et al., 2008; Lustman & Clouse, 2005), cardiovascular disease (Rudisch & Nemeroff, 2003; Thombs et al., 2008), schizophrenia (e.g., Siris, Bermanzohn, Mason, & Shuwall, 1994) and substance abuse (e.g., Watkins, Hunter, Hepner, Paddock, Zhou, & Cruz, 2012). The literature underscores the importance of addressing depressive symptoms not only for the burden it causes on its own, but also for its impact on other physical conditions. It is imperative, therefore, that depression be managed effectively.

Depression Treatment in Primary Care

Given the magnitude of depression's impact, both in terms of the number of individuals affected by the condition and the wide variety of other medical and psychological conditions

affected by it, it is not surprising that depression is most often diagnosed and managed in primary care, the front line of the health care system (Griffiths & Christensen, 2008). It is estimated that 60% of all mental illness is treated by primary care providers (Reiger, Goldberg, & Taube, 1978). Forty-two percent of all primary care patients present with some form of mental illness (Ansseau et al., 2004) and up to 20% of all patients present with clinically significant depressive symptoms (Zung, Broadhead, & Roth, 1993). Major depressive disorder is found in 5 to 10% of primary care patients (Katon & Schulberg, 1992) and nearly 8% of all visits to a primary care physician are depression related (Stafford, Ausiello, Misra, & Saglam, 2000). Already overburdened (Margolius & Bodenheimer, 2010), primary care physicians face the daunting task of managing the vast majority of depression cases. With an average of 10.7 minutes engaged in face-to-face interactions with each patient (Gottschalk & Flocke, 2005), other time constraints, minimal knowledge of mental health issues, and limited opportunities for continuing education in diagnosis and treatment of mental health conditions (e.g., Brown & Wissow, 2012), primary care physicians are systematically handicapped in their ability to effectively detect (Simon & VonKorff, 1995; Williams et al., 1999) and manage (Kendrick, 2000) depression in their patients.

Pharmacotherapy remains the most commonly prescribed treatment by primary care physicians for depression (Stafford et al., 2000) despite the demonstrated effectiveness and recommendation of other interventions (e.g., National Collaborating Centre for Mental Health [NCCMH], 2006). Due to the many pressures placed on primary care physicians, prescribed treatments, even pharmacological treatments, often deviate considerably from clinical practice guidelines (CPGs) regarding the effective treatment of depression (Pincus et al., 2001; Seelig & Katon, 2008). Psychotherapy, psychoeducation and other patient-initiated strategies (e.g.,

exercise, bibliotherapy) are rarely prescribed despite convincing evidence of their effectiveness (e.g., Jorm, Christensen, Griffiths, & Rodgers, 2002). Clinical care gaps (Davis et al., 2007), discrepancies between evidence-based best practices and actual practice, such as those demonstrated here can result in suboptimal care (Hepner, 2007; Huttin, 1997), inefficiency, and excessive expenditures in the health care system (e.g., O'Brien, Jacobs, & Pierce, 2000). Providing care outside current practice guidelines also increases risk of litigation for malpractice (Larkin et al., 2007). While the burden of depression on the primary care system is immense (Üstün et al., 2004), poor management of depressive symptoms through the underutilization of all available evidence-based treatments only serves to increase that burden of depression on the system.

Since the burden of depression appears to exceed the capacity of the primary care system to manage it, a fundamental shift in the responsibility of depressive symptom management must occur. In the same way that public health campaigns have placed the onus of weight management and the management of symptoms related to common illnesses like the flu on patients themselves (e.g., Curry, Sung, Arroll, Goodyear-Smith, Kerse, & Norris, 2006; Katz et al., 2005), a shift towards the self-management of depressive symptoms provides a partial solution to the problem of depression in primary care. Public health campaigns, addressing both prevention and management of symptoms in common physical illnesses, have resulted in a decrease in the utilization of health services (e.g., Grilli, Ramsay, & Minozzi, 2002). It stands to reason, therefore, that a systemic effort to improve patient self-management of depressive symptoms is likely to reduce the burden of depression on the primary care system by reducing the usage of these services by depressed patients. Stepped-care models offer an established framework on which to build capacity among patients to manage their depressive symptoms.

Stepped-care Models

Stepped-care is a health care model that was developed with the view of reducing the burden of mental illness management on primary care (Richards, 2012). Bower and Gilbody (2005) describe stepped care as having two key features: "prescribing least restrictive" treatments and "self-correcting" (Bower & Gilbody, 2005, pp. 11). Treatments applied within a stepped-care approach are the "least restrictive" of those available in that they are the least costly to patients, monetarily and time-wise, and to specialists' time commitments while still providing effective treatment for the severity of mental illness presented. If the level of treatment is inadequate, systematic monitoring of symptoms permits self-correcting, or the ability of the system to increase the intensity of the treatment as required (Bower & Gilbody, 2005). In the context of primary care, the function of this model permits the continued referrals of severe cases of mental illness to tertiary services or specialists (e.g., psychiatry, psychology) while relieving primary care physicians of more mild cases of mental illness. Mild cases are directed to access community resources (e.g., social work, counsellors). This leaves moderately severe cases of mental illness for primary care physicians to manage, which, in the case of depression, is the level of severity most appropriate for and well managed by primary care physicians (e.g., McPherson & Armstrong, 2012). Stepped-care incorporates all levels of intervention in an effort to minimize the burden of mental health on the health care system (Franx, Oud, de Lange, Wensing, & Grol, 2012). Arguments for implementing stepped-care in Canada tout the model's more consistent application of low burden treatments such as patient-initiated strategies (i.e., self-management; Patten, Bilsker, & Goldner, 2008). Before stepped care can be introduced to the current system, however, a greater understanding of behaviour change in the context of these self-management strategies is necessary.

Patient-initiated Strategies for Depression and Low Mood

Clinical practice guidelines for the management of various mental health conditions consistently recommend the use of patient-initiated strategies for self-management (e.g., NCCMH, 2006; NCCMH, 2008; New Zealand Guidelines Group, 2008). Practice guidelines for depression also recommend patient-initiated strategies of which there are a number of evidence-based options (Jorm, Christensen, Griffiths, Parslow, Rodgers & Blewitt, 2004). Bibliotherapy (e.g., Naylor et al., 2010), exercise (e.g., Knubben, Reischies, Adli, Schlattmann, Bauer, & Dimeo, 2007), light therapy (Martiny, Lunde, Unden, Dam, & Bech, 2005), social support (Grav, Hellzen, Romlid, & Stordal, 2011), and monitoring of depressive symptoms (Katon et al., 2001) are all established evidence-based, patient-initiated strategies for depression and low mood. Used independently or adjunct to practitioner-led interventions, patient-initiated strategies have been shown to be effective in significantly reducing depressive symptoms in a variety of contexts (Jorm et al., 2004).

Bibliotherapy. Reading a self-help book (i.e., bibliotherapy) for depression has been shown to significantly improve mood. In a primary care study, 38 patients were each assigned to one of two groups (Naylor, 2010). The first group received treatment as usual from their physician (i.e., antidepressant medication). The second group was asked to read the self-help book *Feeling Good: The New Mood Therapy* by Dr. David Burns. Both groups improved equally well and those who read the book improved without pharmacological intervention (Naylor, 2010). Self-help books present information related to cognitive-behavioural therapy in an easily understood format. They provide information about depression and help individuals understand that they are not alone in their struggle with low mood. The use of self-help books is recommended by the Canadian Psychiatric Association (CPA, 2001).

Exercise. Regular physical exercise has been shown to decrease depressive symptoms. In a study with 38 depressed patients, half of the participants were placed in a group that completed 30 minutes of walking each day for a period of 10 days. The second group completed 30 minutes of relaxation exercises for the same period. Three times more patients in the walking group had significant improvement in their mood than did patients in the relaxation group (Knubben et al., 2007). There are many ways that exercise improves mood. Exercise releases chemicals in the brain that in turn trigger locations in the brain associated with good mood. Exercise improves body image and physical health, which improves self-esteem and mood. Exercise is a great stress reliever and less stress means improved mood. The Canadian Network for Mood and Anxiety Treatment (CANMAT, 2009) and the Canadian Psychiatric Association (CPA, 2009) both recommend exercise as treatment for depression.

Light Therapy. Regular exposure to full-spectrum light (i.e., light from the sun or a "light therapy" lamp) has been demonstrated to improve mood and functioning. One study placed 102 patients with non-seasonal depression into two groups (Martiny, 2004). One group received one hour of bright light each morning for five weeks. The other group received one hour of low light each morning. The bright light group had significantly improved mood following the study (Martiny, 2004). Natural light and light from light-therapy works in two ways to improve mood. First, it increases the amount of neurotransmitters (brain chemicals) associated with heightened mood (e.g., serotonin, dopamine). Second, when timed appropriately, every morning for example, light therapy helps synchronize the body's circadian rhythm with the sleep-wake cycle. The Canadian Network for Mood and Anxiety Treatment (CANMAT, 2009) recommends light therapy for people who experience depression primarily in the winter months. The American Psychiatric Association also recommends light therapy for nonseasonal depression (APA, 2010).

Psychoeducation. Educating patients about the nature, causes, and treatment of depression, even if done briefly and passively, has been demonstrated to significantly reduce depressive symptoms (e.g., Donker, Griffiths, Cuijpers, & Christensen, 2009). Psychoeducation can be a considered a patient-initiated strategy if patients are provided with educational material to read (e.g., Christensen, Griffiths, & Jorm, 2004) or are directed to seek out information on their own. In one study, 166 individuals with depression were asked to read a webpage that provided information about depression. Those individuals who learned more about depression saw a significant reduction in depressive symptoms. Furthermore, people who learned more about depression were more likely to make recoveries than those who had learned less (Christensen, Griffiths, & Jorm, 2004). Knowing more about low mood and depression can help one identify their symptoms more readily and allow them to apply other patient-initiated strategies or seek professional help sooner. Many organizations recommend education for people experiencing depression or low mood including the College of Family Physicians of Canada (CFPC, 2007) and the Canadian Network for Mood and Anxiety Treatment (CANMAT, 2009).

Socializing. Maintaining healthy relationships with friends and family and starting new relationships can be a great way to improve mood. In a study of over 40,000 Norwegians, researchers found that regardless of age or gender, those individuals with greater social support had more positive moods (Grav, Hellzen, Romild, & Stordal 2012). Social support in this study included emotional support or more tangible sources of support (e.g., help at home). When experiencing low mood some people isolate themselves and remove themselves from the company of others. This only serves to worsen one's mood with feelings of loneliness or rejection. Visiting with friends to do something enjoyable, even if one does not feel inclined to do so, has been demonstrated to improve one's mood. In their clinical practice guidelines for the

treatment of depression, the College of Family Physicians of Canada (CFPC, 2007) and the National Collaborating Centre for Mental Health - National Institute for Health and Clinical Excellence (NICE, 2009) both recommend increased social support and social activities to help improve mood.

Symptom Monitoring. Monitoring and being aware of one's depressive symptoms can actually help improve mood. In a study of 386 depressed patients who were prescribed antidepressant medication by the physician, those that took part in a relapse prevention program that included routine monitoring of depressive symptoms saw a greater increase in mood than those who did not monitor symptoms. Those patients who monitored their symptoms were also more likely to follow their physician's directions for treatment (Katon et al., 2001). Regularly monitoring symptoms of low mood or depression can help one recognize when they have made improvements and help identify strategies or experiences that have helped improve their mood. Monitoring symptoms can also help one recognize when their mood is deteriorating, allowing them to intervene sooner. The National Institute for Health and Clinical Excellence (NICE, 2009) recommends symptom monitoring in its latest clinical practice guidelines for the treatment of depression and low mood.

Other Patient-initiated Strategies. The stepped-care model has yet to be established in the Canadian health care system (Patten et al., 2008) and while the current system already contains the mechanisms for specialist referrals, a stepped-care model would serve to systematize this process and increase efficiency (Scogin et al., 2003). Until such a time that these referral mechanisms are more efficient, patients themselves must monitor and adhere to prescribed treatments on their own and seek out specialized services, like psychotherapy. In this way, routine adherence to medication prescriptions (Katon et al., 1995) as well as actively

seeking psychotherapy or counselling services (e.g., Fava, Rafanelli, Grandi, Conti, & Belluardo, 1998) can also be considered patient-initiated strategies.

Adhering to prescribed medications. Taking prescribed medication regularly as directed can significantly improve mood. In a study published in the Journal of the American Medical Association, it was discovered that the patients who took their antidepressant medication regularly were 25% more likely to feel that the medication helped improve their mood than those who did not take their medication regularly. Seventy-five percent of individuals who took their medication regularly had a 50% or greater reduction in their depressive symptoms. Less than half of those who did not take their medication regularly saw an increase in mood (Katon et al., 1995). Some of the most common medications prescribed for low mood and depression require time for the drug to build up in the body before it has the desired effect. Taking medication regularly allows the drug to function the way it is intended. Following prescription directions for taking medication is, therefore, important. All professional healthcare organizations recommend taking medications as prescribed including the Canadian Medical Association and the Canadian Psychiatric Association (CPA, 2001).

Seeking psychotherapy services. Psychotherapy is considered to be one of the most effective treatments for depression and low mood. Cognitive behaviour therapy (CBT) is widely considered to be a first-line psychological treatment for depression. In one study, 40 primary care patients with depression were randomly assigned to one of two groups (Fava, Rafanelli, Grandi, Conti, & Belluardo, 1998). The first group received CBT from a qualified mental health professional in addition to care as usual from their physician. The second group simply received care as usual from their physician. In addition to showing a greater reduction in depressive symptoms, the patients that received CBT were also more likely to be in remission and

medication free two years after completing psychotherapy. Patients who did not complete CBT were four times more likely to relapse (Beck, 2005; Fava et al., 1998). Through weekly 1-hour sessions with a qualified professional, CBT teaches skills that help one change their behaviour and the way they think. CBT has been shown to actually change the way parts of the brain function meaning the effects of CBT last long after psychotherapy has finished. The Canadian Network for Mood and Anxiety Treatment (CANMAT, 2009) recommends psychotherapy for depression as does the Canadian Psychiatric Association (CPA, 2001).

Patient-initiated Strategies in Stepped-care Models

In stepped-care models, patient-initiated strategies represent the lowest burden interventions with patients themselves administering treatment (Scogin, Hanson, & Welsh, 2003). Bibliotherapy, exercise, light therapy, social support, symptom monitoring, psychoeducation, adhering to medication prescriptions and seeking psychotherapy or counselling services are examples of the most effective patient-initiated strategies for depression. These evidence-based strategies have the capacity to reduce the burden of depression on the primary care system and lessen the burden of depression itself on patients.

Although patient-initiated strategies have been shown to be effective (e.g., Jorm et al., 2002), they are the most underused treatments in the management of depression (e.g., Taylor et al., 2009; Wang, Berglund, & Kessler, 2000). While usage rates for each individual patient-initiated strategy are not known, given the increasing prevalence of depression worldwide it is reasonable to assume that these strategies are not being employed effectively in the general population. Patients in primary care settings are rarely given information regarding evidence-based, patient-initiated strategies and are infrequently educated about depression. Primary care physicians neither have adequate time nor sufficient knowledge to effectively communicate the

nature and benefits of patient-initiated strategies for depression and low mood to their patients (e.g., Scogin, Hanson, & Welsh, 2003). This breakdown in the passage of useful, evidence-based knowledge to the providers of patient-initiated care, the patients themselves, is the result of an overburdened primary care system. The information exists, the providers exist, and the recipients exist. Facilitating the communication of information regarding patient-initiated strategies for depression between researchers and patients themselves is the challenge presented. An educational intervention aimed at improving the understanding of patient-initiated strategies among patients themselves appears to be a potential solution to this knowledge gap, and improved knowledge about patient-initiated strategies for depression and low mood is part of the solution to increasing engagement in these behaviours.

Theoretical Background

Low usage rates of patient-initiated strategies for depression and low mood suggest some impediment in the behaviour change process (i.e., from acknowledgement of mood difficulty to engagement in patient-initiated strategies). Given that primary care practitioners rarely educate patients with regard to depression in general and self-management through patient-initiated strategies, it appears that a lack of knowledge regarding these strategies may contribute to the low use of these strategies. Efforts to improve usage of these strategies must, therefore, include a better understanding of the passage of information from physicians, or other sources, to patients. K*, Knowledge Translation, and Knowledge Transfer theory offers that important perspective.

Knowledge Translation and Knowledge Transfer

Educational interventions. A significant empirical base supporting the use of patient-initiated strategies for depression exists in the scientific literature (e.g., Jorm et al., 2004). As

indicated previously, low usage rates of these strategies among patients likely stems from a lack of knowledge regarding the benefits of applying these strategies in the context of depression and low mood. It follows logically that educational interventions are an appropriate approach to remedy this gap in knowledge. Educational interventions have been found to be effective in improving clinician adherence to evidence-based practices in a number of different settings (e.g., Parrish & Rubin, 2010; Shirazi et al., 2013; Varnell, Haas, Duke, & Hudson, 2008). The same types of educational interventions may also be effective in improving patient adherence to patient-initiated strategies for depression and low mood. In the case of evidence-based information, educational interventions are optimally applied using K* mechanisms.

Definition of K*. The study and application of passing knowledge from one entity to another is a field that is relevant to many different disciplines and in many different contexts. As a result, this field of study is particularly diverse with different disciplines using different terminology to refer to different concepts. In an effort to consolidate the field, numerous organizations have attempted to establish common definitions for terminology. The United Nations University Institute for Water, Environment, and Health (Shaxson et al., 2012), in collaboration with other organizations, coined the term K* as a collective label for all concepts related to the study and application of knowledge passage.

Simply put, K* encompasses all the mechanisms by which one individual or organization is influenced by the experience of another individual or organization (Argote & Ingram, 2000). K* is often bi-directional. Information not only flows from researchers (typically knowledge sources) to decision makers (typically knowledge recipients), but also from decision makers to researchers, a process that helps form new research questions, new investigations and new information (e.g., Keifer et al., 2005). In the context of health care, K* has principally been used

to investigate the manner in which evidence-based, best care practices are communicated from health researchers to practitioners (Mitton et al., 2007). K*, health related and otherwise, also includes concepts related to the exchange of information between researchers and policy makers (e.g., Jones, Datta, & Jones, 2009), however, these concepts have little relevance in the current study and will not be discussed further here.

In a recent review of the different K* models currently described in the literature, Davison and the National Collaborating Centre for Determinants of Health (NCCDH; 2013) identified 48 different K* models. It is apparent from an independent review of the literature that the field is considerably disunited, with many terms being used to encompass all aspects of K*. In an effort to remedy this problem, Shaxson and colleagues (2012) undertook a thorough examination of the different terminology currently used and provided helpful definitions for each. Relevant to the issue of evidence-based educational interventions for patients, Knowledge Translation and Knowledge Transfer appear to be the most appropriate and useful terms. Concepts and definitions associated with each of these terms vary widely from discipline to discipline as well as between researchers and decision makers within disciplines. For the purposes of the current study, the term descriptions below will be used.

Knowledge Translation. Knowledge Translation refers specifically to the "process of translating knowledge from one format to another so that the receiver can understand it" (Shaxson et al., 2012, pp. 4). In this way, Knowledge Translation represents the first step in conveying knowledge derived from scientific investigation to patients. Rooted in the fields of applied linguistics and communication, Knowledge Translation involves a number of different processes including consolidation of research findings, increasing awareness among knowledge recipients, creation of messages that result in action, and the adaptation of research findings to

address the specific needs of knowledge recipients (Ottoson, 2009). In a word, Knowledge Translation refers most specifically to the "what" of K*, that is what knowledge is to be transferred, implemented, or utilized. While the function that Knowledge Translation holds in K* is seen by some to be a recurring process with a feedback loop that continuously informs future Knowledge Translation activities (Ottoson, 2009), it is viewed by others as a simple two step, unidirectional process (Hiss, 2004). As applied in the context of health related behaviours, Hiss (2004) argues that Knowledge Translation begins first with the translation of scientific discoveries into practices that can be applied at the point of care. Second, Hiss (2004) suggests, Knowledge Translation seeks to have these scientifically informed practices adopted by practitioners or patients in real-world circumstances. It seems, however, that Hiss' (2004) second phase of translation enters into the realm of Knowledge Transfer (Shaxson et al., 2012). As Ottoson points out, "[adoption and application of knowledge] is not a key determinant of translation success" (Ottoson, 2009, pp.12).

Knowledge Transfer. Knowledge Transfer is defined by Shaxson and colleagues as "a one-way process of sharing knowledge which can be construed as more of a teacher-student relationship than other knowledge-related activities" (Shaxson et al., 2012, pp. 3). In addition to considering the nature of the information to be transferred, Knowledge Transfer addresses the context of knowledge providers and knowledge recipients as well as the mechanisms by which information is transferred (Ottoson, 2009). Baldwin and Ford (1988) offer a proposed model of Knowledge Transfer in the context of education. Figure 1 is a graphical representation of this model. In this model, training design (i.e., mechanism of knowledge transfer), trainee characteristics (i.e., knowledge recipient characteristics), and work environment (i.e., context of location where learning occurs) are all considered training inputs. Each of these inputs is

believed to have a direct impact on learning and retention of the information itself. Learning and retention then has an effect on the application of knowledge in behaviour. Baldwin and Ford (1988) hypothesize that both the context in which learning occurs (work environment) and the characteristics of the knowledge recipients (trainee characteristics) have the potential to influence the application of knowledge directly. The Baldwin and Ford (1988) model of Knowledge Transfer provides a helpful framework to better understand the process of educating patients with evidence-based information. While Knowledge Transfer and Knowledge Translation both give consideration to the type of information being transferred, it is the expressed purpose of the latter concept and, therefore, matters related to the formation of the message in the current study will be considered Knowledge Translation.

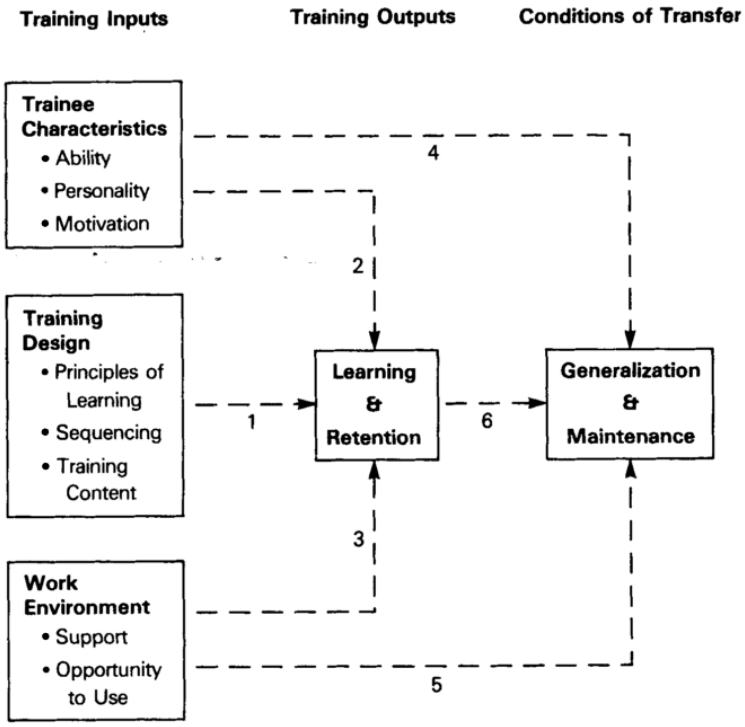

Figure 1. Diagram of Baldwin and Ford's (1988) model of educational knowledge transfer.

Knowledge Translation and Knowledge Transfer integrated. Although no unified theory of K* has been developed (Mitton et al., 2007), Lavis, Robertson, Woodside, McLeod and Abelson (2003) outline five key, commonly accepted elements of K* framework relevant to educational interventions for patients: the message, the audience, the messenger, the mechanism, and the evaluation of the effect of the passage of information. Most of these elements fit with the current study's understanding of Knowledge Translation and Knowledge Transfer. When applying this common understanding of K* along with the specific theoretical concepts related to Knowledge Translation and Knowledge Transfer, the audience (trainees, knowledge recipients) of an educational intervention focussed on patient-initiated strategies for depression and low mood are viewed as the patients themselves. Relevant characteristics of the audience in this context include their lay knowledge of evidence-based information and scientific investigation, depressive symptoms, and a moderate level of motivation to learn about the subject matter.

The messenger and the mechanism, as described by Lavis and colleagues (2003), appear to fit within Baldwin and Ford's (1988) concept of the mechanism in Knowledge Translation. Health care providers, and primary care physicians specifically, are the intended messengers in the primary health care system for information related to depression and patient-initiated strategies for depression (e.g., Jorm et al., 2002). The messenger of an educational intervention of this nature may also include the researchers themselves, as in the current study, or others through public health campaigns and human resource initiatives. Given the audience and the magnitude of the problem posed by depression and low mood, a messenger with sufficient authority and an ability to connect with a large number of people would provide the greatest impact. The mechanism for the transfer of this information can take many forms including in-person training, presentations, and publications. In the context of mental health, the use of

internet-based resources (e.g., websites, downloadable material) has been demonstrated to be effective in communicating reliable information (e.g., Zermatten, Khazaal, Coquard, Chatton, & Bondolfi, 2010) and is often the preferred mechanism of Knowledge Transfer (Reynolds, 2011). Using an internet-based mechanism for the Knowledge Transfer of evidence-based information related to patient-initiated strategies for depression is, therefore, suitable. Ideally, an internet-based educational intervention would present information in multiple modalities including visually, with videos or in-person presentations, and in text with written materials (Ginns, 2005). Information would also be presented to the audience on multiple occasions and would be readily accessible to audience members at any time.

While the audience, the messenger, and the mechanism are self-evident, determining the message to be transferred requires particularly careful consideration if it is to have the desired effect. This is the jurisdiction of Knowledge Translation theory. Firstly, the information in any educational intervention must be captured in a simple, easily understood package (e.g., Mitton et al., 2007). This point is doubly important in the context of presenting scientifically derived information to patients who, in general, have a lay understanding of scientific methods and concepts. A synthesis of various research findings into a message that can be acted upon is required (Ottoson, 2009). Specifically, the message must include evidence-based information regarding the “what”, “where”, “why”, “how”, and “who” relevant to specific behaviour or practice, which are the patient-initiated strategies in the case of the current study (Ebener et al., 2006). For example, the information contained in the message for a particular patient-initiated strategy might include an adequate description of the strategy (i.e., what), the scientific evidence that demonstrates the strategy’s efficacy in reducing depressive symptoms (i.e., where), the scientifically supported mechanisms for the strategy’s demonstrated efficacy (i.e., why),

evidence-based recommendations on applying the strategy in day-to-day life (i.e., how), and which professional organizations recommend the use of the strategy for reducing depressive symptoms (i.e., who).

In the case of patient-initiated strategies for depression, a properly structured message with an appropriate mechanism is ultimately meant to increase a patient's frequency of engagement in a particular strategy (e.g., exercise); however, as is observed in other K* literature, successful passage of information does not reliably change behaviour in the recipients of knowledge (e.g., Dobbins, Ciliska, Cockerill, Barnsley, & DiCenso, 2002). In Baldwin and Ford's (1988) model, knowledge successfully transferred (i.e., learned and retained) is shown to influence "generalization" and "maintenance" but behaviour change itself is not directly addressed. K* theory examines the nature of the passage of information, the push and pull of knowledge, from one entity to another (Mitton et al., 2007). K* theory implicitly assumes that knowledge received is immediately acquired and applied resulting in direct behavioural change. Although knowledge recipients in industry may be influenced by external motivators to change behaviour, for example corporate policy or the incentive of greater profits (Argote & Ingram, 2000), real attitude and behavioural change are known to be influenced by internal motivators (e.g., Miller & Rollnick, 1991). In health care K*, decision-makers are more likely to rely on their own experiences with, and opinions on, various practices in deciding whether or not to apply evidence-based information to their own behaviour (e.g., Bohannon & LeVeau, 1986; Luker & Kendrick, 1992). Efforts to change health related behaviour through K*, and specifically in the context of information regarding patient-initiated strategies for depression and low mood, therefore, require an additional theoretical framework that focuses explicitly on behaviour change.

The Theory of Planned Behavior

The Theory of Planned Behavior (TPB; Ajzen, 1991) was developed as a means of better understanding the factors associated with engagement in behaviour. Unlike the Transtheoretical Model of behaviour change (Prochaska & DiClemente, 1983) and other multi-stage models of behaviour change (see Armitage & Conner, 2000 for a review), which emphasize different aspects of behaviour change based on specific stages of readiness to change, TPB is applicable to persons at all stages of readiness to change. As such, TPB is more easily applied to generic educational interventions like those based on Knowledge Transfer and Knowledge Translation theory. Furthermore, TPB provides a common set of variables through which the impact of an educational intervention on behaviour change can be examined in this and other contexts. Finally, while TPB does not elaborate on the concept of intentions like Behavioural Enaction Models (e.g., Gollwitzer, 1993; Bagozzi, 1992), its extensive use in the context of behaviour change for other health behaviours (Armitage & Conner, 2000) permits investigations using this model to be more easily compared to other health behaviours and situated in the current literature.

History of the concept. Behaviour change has long been an interest of social and personality psychologists alike (Sherman & Fazio, 1983). The study of behaviour change began primarily with investigations into concepts related to behavioural dispositions (Ajzen, 1991; Campbell, 1963). Social attitude and personality trait in particular were both identified as early elements of behavioural dispositions. Attitudes, defined as "evaluative feelings of pro or con, favourable or unfavourable, with regard to an object" (Insko & Scholper, 1967, pp. 361-362 as cited by Wicker, 1969), were originally investigated in relation to specific behaviours under specific circumstances. Furthermore, the methodology used to measure attitudes were often

verbal and in many cases themselves introduced a wide variety of other factors, including, for example, affect, beliefs, and other behavioural dispositions (Wicker, 1969). The results of these studies, unsurprisingly, revealed a great deal of "attitude-behaviour inconsistency" and considerable scepticism towards attitude as a determinant of overt behaviour. This early research suggested that attitude towards a behaviour was but one element of an individual's dispositions towards a particular behaviour (Wicker, 1969).

The second popularly theorized determinant of behaviour in early investigations was personality trait (Ajzen, 1991). This research aimed to demonstrate the association between various personality traits and behaviour (Mischel, 1968). It was observed, however, that any significant consistencies between traits and behaviour were highly specific, not generalizable, and better explained by the situational circumstances of the behaviour. Furthermore, as was observed in the case of early attitude investigations, the measurement methodology for personality traits and behaviour often confounded results (Mischel, 1968). Weak correlations in other studies, once thought to be due to methodological issues, were viewed by some as disproof of the association between personality traits and behaviours. Ajzen (1991) explains that while many considered personality traits to no longer be an element of behavioural dispositions, others continued the pursuit of this association.

Both in the case of attitudes and personality traits, investigators turned to aggregation as a means of creating more generalizable results (Epstein, 1983). Aggregation refers to the act of removing the specificity of a particular behaviour by gathering related behaviours across occasions and situations and analyzing associations for these behaviours together. As a result, attitudes and personality traits were observed to influence behaviours at a general level (Ajzen, 1991). While beneficial for a general understanding of behavioural disposition, the principle of

aggregation applied here does not provide clarity regarding individual factors that influence behaviours in specific circumstances. This gap in knowledge led to the development of the Theory of Reasoned Action (Ajzen & Fishbein, 1980).

Theory of Reasoned Action. Pulling primarily from social psychology, Ajzen and Fishbein (1980) developed the Theory of Reasoned Action (Ajzen & Fishbein, 1980) as a model of behaviour disposition. As part of this theory, the authors hypothesized that intentions to engage in a behaviour served as an intermediary between antecedent variables and the behaviour itself. Intentions were believed to be the "immediate determinant" of a behaviour (Ajzen & Fishbein, 1980). Ajzen would later explain that intentions are intended to "capture the motivational factors that influence a behavior" (Ajzen, 1991, pp. 181). Numerous studies since the concept of intentions was first introduced have demonstrated the causal relationship between intentions and behaviour (e.g., Webb & Sheeran, 2006). Indeed, the introduction of intentions represented a significant step in the field of behaviour disposition and behaviour change theory.

Ajzen and Fishbein's (1980) Theory of Reasoned Action also postulated that attitude and subjective norms comprised the antecedent factors that lead to intentions to engage in a specific behaviour. In their theory, attitudes are described as a function of one's belief regarding the consequences of engaging or not engaging in a particular behaviour and the evaluation of those consequences. Subjective norms are identified as a function of one's assessment of whether others important to that individual approve or disapprove of their engagement in a particular behaviour and the degree to which individual is inclined to be influenced by what those important others wish for them. In brief, the theory of reasoned action suggests that attitudes and subjective norms together determine intentions, which in turn determines engagement in behaviour. At the time of its conception, this theory was believed to "explain virtually any

human behaviour" (Ajzen & Fishbein, 1980); however, it did not take long for criticism to befall this new theory.

In his critical assessment of the Theory of Reasoned Action, Sarver (1983) pointed out that Ajzen and Fishbein's (1980) theory failed to consider what he termed the context of opportunity. In essence, Sarver argued that although an individual's beliefs may have lead to a positive attitude towards a particular behaviour and they may also believe that important and influential others approve of their engagement in that same behaviour, circumstances beyond their control may prevent them from engaging in the behaviour despite their best intentions. In this way, Sarver explained that the causal nature of the Theory of Reasoned Action breaks down and intentions fail to predict actual engagement in a behaviour. While Ajzen and Fishbein (1980) acknowledged this in a cursory manner in the Theory of Reasoned Action referring to "idiosyncratic events", Sarver (1983) suggested that context of opportunity should be elevated to a systematic consideration in the model. Others in the field echoed this concern (e.g., Liska, 1984; Kuhl, 1985).

Sarver (1983) also voiced some reservation regarding the object of the Theory of Reasoned action, that being the behaviour itself. Sarver argued that an individual not only has beliefs about a behaviour, but also the context in which that behaviour occurs. Therefore, according to Sarver (1983), the object of the causal nature of the theory is not the actual behaviour but instead an anticipated behaviour. Furthermore, an individual's belief regarding the context of a particular behaviour has the potential to change over time thus causing additional complications. In effect, beliefs about the context in which a behaviour occurs have the potential to influence whether or not an individual actually engages in that behaviour. For these reasons, Sarver rejected the causal nature of Ajzen and Fishbein's (1980) theory. While some of the

Sarver's (1983) and other's concerns regarding the Theory of Reasoned Action were later addressed, the problems around anticipated behaviour were not.

Theory of Planned Behavior. To address the issue of context of opportunity, Ajzen (1991) revised the Theory of Reasoned Action to include a variable that captured the resources and opportunities available and required by an individual to engage in a behaviour. Drawing on Bandura's work, Ajzen applied the concept of perceived self-efficacy in creating "perceived behavioural control" as a third antecedent variable. Together with the variables from the original Theory of Reasoned Action, Ajzen (1991) began to develop the Theory of Planned Behaviour (TPB). Like its predecessor, TPB (Ajzen, 1991) proposes that an individual's intention to engage in a particular behaviour is the main determinant in the behaviour exhibited by that individual. The theory incorporates three factors that are said to impact intentions to engage in a behaviour: 1) attitudes, a function of one's belief regarding the consequences of engaging or not engaging in a particular behaviour and the evaluation of those consequences, 2) subjective norms, a function of one's assessment of whether important others approve or disapprove of their engagement in a particular behaviour and the degree to which the individual is inclined to be influenced by what those important others wish of them, and 3) perceived control over the behaviour. The three antecedent variables are said to influence each other as well as influence intentions.

Ajzen (1991) elaborates on the concept of perceived behavioural control linking it to the construct of self-efficacy and its impact on such factors as activity preparation, amount of effort expended during engagement, and cognitive and emotional reactions. The positive impact that self-efficacy (i.e., perceived behavioural control) made on Ajzen's behaviour change model made it an important addition to Ajzen's (1991) theory of behaviour change. In addition to having an effect on intentions, perceived behavioural control has also been demonstrated to

directly impact actual engagement (Ajzen, 1991; Terry & O'Leary, 1995). To clarify, Ajzen (1991) explains that perceived behavioural control becomes a relevant predictor of intentions only if an individual does not have complete volitional control over the behaviour in question. According to Ajzen, if an individual is completely capable of engaging in a particular behaviour, intention, as influenced by attitudes and subjective norms, is the greatest predictor of actual engagement. When an individual does not have complete volitional control over a behaviour, intentions and perceived behavioural control together become predictors of actual engagement in the behaviour (Ajzen, 1991).

Criticisms of the Theory of Planned Behavior. As with the Theory of Reasoned Action, TPB received criticism (Ajzen, 2011). While the theory appears to work well under many circumstances with high correlations between antecedent variables and intentions and between intentions and behaviour engagement observed, the intentions-behaviour correlation is occasionally poor. Ajzen (2011) points to the example of a study in which TPB variables were investigated in relation to sleep hygiene behaviours (Kor, & Mullan, 2011). The results of the study suggested that intentions only weakly predicted actual engagement in sleep hygiene behaviours. Ajzen (2011) explains that in the case of some behaviours, actual control over a behaviour is a more accurate predictor of engagement in the behaviour than perceived behavioural control. In the example of the sleep hygiene study, Azjen suggests difficulties self-regulating and an inability to avoid distressing thoughts or anxiety prevented individuals in the study from truly being in control of their sleep hygiene behaviour, even though their perceived behaviour control for those behaviours may have been high (Ajzen, 2011; Kor * Mullan, 2011). A low intention-behaviour correlation is a problem and "a warning that we may be reaching the limits of reasoned action" (Ajzen, 2011, pp. 1115).

From the earliest conceptualizations of behaviour change theory, affect was identified as a possible determinant of future behaviour (e.g., Wicker, 1969). Therefore, it did not go unnoticed that TPB did not explicitly include affect or emotional variables in its model. Ajzen (2011) pointed to this omission as a chief concern among his critics who claimed that his theory focussed solely on rationale decision-making and neglected the effect of emotions. Ajzen (2011) argued that while affect is not an explicit variable in the Theory or Planned Behaviour, it is likely to influence the beliefs that lead to one's attitude, subjective norms, and perceived behavioural control (e.g., McGee et al., 2003 as cited in Ajzen, 2011). Ajzen (2011) focuses more attention on anticipated affect, the affect expected during or following the behaviour in questions. While anticipated affect appears to be related to the early criticisms of Sarver (1983) around beliefs related to the context of a behaviour, it does not address the issue of prior affect in TPB. The variance that prior affect has on non-health related behaviour may be of little consequence, but the potential for prior affect, and more specifically mood difficulties, to impact health behaviour, and mental health behaviour in particular, is considerable. While some studies have demonstrated the effect of affect on TPB (e.g., Catellier & Yang, 2013), no studies to date have clearly addressed the issue of mood difficulties (e.g., depression or low mood) on TPB.

Applications of the Theory of Planned Behavior. While there are a number of difficulties with TPB, it remains one of the most popular theoretical models for behaviour change and is widely used across a variety of settings (Ajzen, 2011). The most commonly used application of TPB in health care literature is its use in determining the ability of its three factors, attitude, normative beliefs and perceived behavioural control, to predict intentions of patients to engage in health behaviours (e.g., Kam, Knott, Wilson, & Chambers, 2012; Plotnikoff, Lubans, Costigan, & McCargar, 2012). While intention is shown to be a relatively consistent indicator of

actual behaviour (Ajzen, 2011), the power of each of the three antecedent variables to predict intention varies depending on the behaviour investigated. For example, perceived behavioural control and attitude were the greatest predictors of intention to engage in proper hand washing (Shapiro, Porticella, Jiang, & Gravani, 2010) whereas attitude and subjective norms towards premarital sex were most predictive of intentions to engage in premarital sex among females (Cha, Doswell, Kim, Charron-Prochownik, & Patrick, 2007). Understanding the variation in the ability of the three TPB factors to predict specific variables helps inform and tailor interventions specific to those behaviours.

Interventions based on TPB factors have been demonstrated to be effective in changing behaviour (e.g., Gerand & Shepherd, 2012) and to have lasting effects (e.g., Welsh et al., 2012). TPB-based interventions work best when TPB factors found to be the most predictive of intention to engage in a particular behaviour are the focus of the intervention. For example, in a study that evaluated the impact of a TPB intervention on hand washing, elements of the education intervention that specifically impacted attitude towards change, the TPB factor with the greatest ability to predict intention to engage in hand washing, were found to be the most effective in improving intentions to hand wash (Yardley, Miller, Schlotz & Little, 2011). Although many TPB-based interventions have demonstrated the ability to effect significant positive change on the three antecedent variables and, subsequently, intention and actual engagement in behaviour by providing information related to the health behaviour, many of these interventions fail to provide all of the types of evidence-based knowledge related to the behaviour (i.e., what", "where", "why", "how", and "who"; e.g., Gerand & Shepherd, 2012; Welsh et al., 2012). Neglecting to incorporate all types of knowledge in an educational intervention, according to K*, lessens the desired impact of the intervention (i.e., application of

knowledge). Integration of K* principles would likely add to the positive effect that TPB interventions already demonstrate.

As previously discussed, the context in which behaviours occur is of particular importance to the TPB model (Ajzen, 1991; Sarver, 1983). Context also includes affect. TPB has proven informative in studying a wide variety of health behaviours; however, examining intentions to engage in depression-related health behaviours presents unique challenges. Firstly, TPB does not directly address the influence of affect and emotion (e.g., Wolff, Nordin, Brun, Berglund, & Kvale, 2011). The nature of an individual's mood, positive or negative, is said to have an effect on their attitude towards a behaviour, their normative beliefs as well as perceived behavioural control (e.g., Johnson & Tversky, 1983; McKee, Hinson, Wall, & Bissonnette, 2003). This is true regardless of what health behaviour is being investigated but is likely to have the largest impact among individuals who are depressed and among individuals who are being asked to change behaviour related specifically to depression and low mood. As a result of these difficulties with the TPB model, it has rarely been used to investigate behaviours that contain an affective or emotional component and has never been used to investigate behaviour change in depressed individuals. Knowledge of the impact of affect and mood difficulties on the TPB model is essential to a better understanding of behaviour change in the context of patient-initiated strategies for depression and low mood.

Rationale for the Current Study

The current K* literature, and that of Knowledge Translation and Transfer specifically, offers a sound theoretical basis on which to develop and deliver an effective package of evidence-based information for educational interventions related to health behaviours. However, the K* literature does not address the beliefs and attitudes of knowledge recipients that

ultimately influence whether or not those recipients act on the knowledge they have received. The underlying implicit assumption of K* appears to be that knowledge recipients fully acquire received information and immediately modify behaviour in compliance with that information. Applications of K* have demonstrated mixed results regarding behaviour change (e.g., Dobbins et al., 2002; Mitton et al., 2007) suggesting that the effect of Knowledge Translation and Knowledge Transfer applications is dependent on factors outside the scope of K*. TPB offers a framework for better understanding the effect of K*-based educational interventions on behaviour change in health care. Applications of K* would benefit greatly from framing information to coincide with known internal factors related to intention and behaviour change (i.e., attitude, normative beliefs, perceived behavioural control). Reciprocally, TPB, a theory used primarily to describe the relationship between internal factors, intentions, and behavioural change, would benefit from applying K* principles to maximize the impact of educational interventions.

The current study aimed to examine TPB in the context of patient-initiated strategies for depression and low mood. In addition to better understanding the relationship between TPB variables and mood difficulties, this investigation also applied a Knowledge Translation and Knowledge Transfer-based educational intervention intended to target TPB antecedent variables as a means to improving intentions and actual engagement in patient-initiated strategies for depression and low mood. It was hoped that combining TPB and Knowledge Translation and Knowledge Transfer together in this way would inform the theoretical understanding of each and also demonstrate the utility of an integrated model for educational interventions intended to change behaviour.

Proposed Model of Knowledge Translation and Transfer-based Behaviour Change

Based on the strengths of Knowledge Translation and Knowledge Transfer theory and TPB, the objectives of the current study aimed to test an integrated model of behaviour change and the passage of information related to patient-initiated strategies for depression and low mood. Figure 2 is a visual representation of this hybrid model. In addition to examining the application of TPB in the context of depression and low mood, the current study integrated the behaviour change principles encompassed in TPB into the process of learning about patient-initiated strategies for depression using Knowledge Translation and Knowledge Transfer principles. In so doing, the current study was intended to develop insight into the mechanisms of behaviour change resulting from K*-based educational interventions and the effect of applying K* principles to target antecedents of intentions to engage in behaviour.

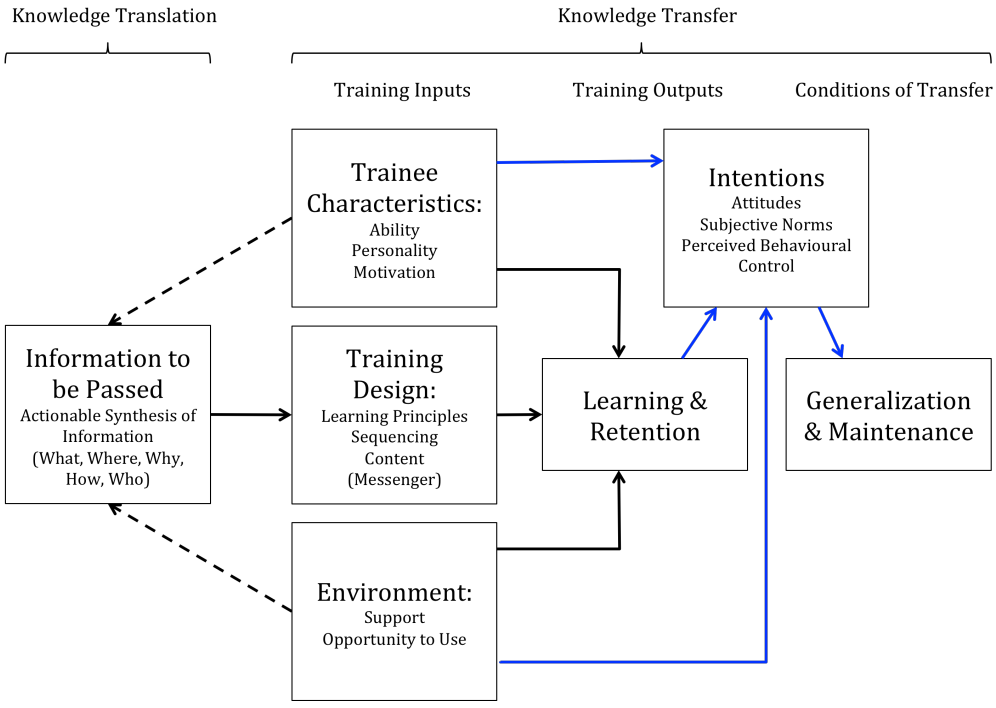

Figure 2. A visual representation of a proposed hybrid model including Knowledge Translation and Knowledge Transfer theory and the Theory of Planned Behavior.

Study Overview

Using an online survey and educational intervention delivery system, the current study aimed to first better understand the ability of the three TPB antecedent variables, attitude, subjective norms, related to both significant others and powerful others (i.e., family physicians), and perceived behavioural control, to predict intentions to engage in and actual engagement in eight different, evidence-based patient-initiated strategies for depression and low mood: bibliotherapy, exercise, light therapy, social support, symptom monitoring, psychoeducation, adhering to medication prescriptions, and seeking psychotherapy services. For the purposes of comparison, a ninth strategy, pet therapy, which does not have empirical evidence to support its use as a patient-initiated strategy for depression and low mood, was included in the examination of TPB variables.

Secondly, using Knowledge Translation and Knowledge Transfer principles, an educational intervention aimed at changing attitudes and beliefs (i.e., TPB antecedent variables) toward the patient-initiated strategies for depression and low mood was developed and delivered using the online system. For the eight strategies with evidence demonstrating their effectiveness or efficacy in reducing depressive symptoms, the educational intervention was intended to improve attitudes and beliefs. In the case of pet therapy, which does not have evidence supporting its use as a patient-initiated strategy, the educational intervention was intended to dispel positive attitudes and beliefs regarding its use to improve mood. The current study investigated the impact of this educational intervention on TPB antecedent variables and the subsequent effect on intentions to engage in and actual engagement in the patient-initiated strategies for depression. The addition of pet therapy and the negative educational intervention was intended not as a control but as a means of examining differences between evidence-based

and anecdotal strategies for self-management of depression or low mood and examining differences between similarly structured positive and negative educational interventions.

The educational intervention was implemented in a randomized control trial format. Based on K* principles, information that the intervention group received included a) an adequate description of the strategy, b) the scientific evidence that demonstrates the strategy's efficacy in reducing depressive symptoms, c) the scientifically supported mechanisms for the strategy's efficacy or effectiveness, d) evidence-based recommendations on applying the strategy in day-to-day life, e) which professional organizations recommend the use of the strategy for reducing depressive symptoms, f) practical suggestions for how to engage in the patient-initiated strategies, and g) resources to help participants engage in the behaviour more easily (e.g., website links, information sheets). This information was delivered by way of text on a website. The information included in the educational intervention was selected specifically to effect change on each of TPB antecedent factors. While each type of knowledge is intended to positively, or in the case of pet therapy negatively, impact each factor to some degree, some types of knowledge may have a greater effect on one TPB factor than the others (e.g., evidence-based recommendations on applying the strategy in day-to-day life is likely to have a stronger effect on perceived behavioural control than on attitude or normative beliefs). The K*-based information was intended to improve individuals' pre-existing ratings of attitudes, normative beliefs and perceived behavioural control toward patient-initiated strategies for depression and low mood, ultimately affecting intention to engage in these behaviours and actual engagement in these behaviours. Control groups received a sham intervention in lieu of the K*-based information. The sham intervention was a section of text, similar in length to the K*-based intervention text, focussed on a historical topic loosely related to each specific strategy (e.g.,

history of the Olympics for exercise). This content was extracted from Wikipedia entries. Ratings of TPB variables were collected before and after the intervention phase, both occurring at time point one. A follow-up was completed two to three weeks after completion of the first part of the study.

Novel Contributions

The novel contributions of the current study include, at a practical level, the investigation of TPB in the context of patient-initiated strategies for depression and low mood. This investigation provides a better understanding of the attitudes and beliefs that the participant population holds towards various patient-initiated strategies and also sheds light on the manner in which TPB variables interact with each other and ultimately predict intentions and actual engagement in these behaviours. This study provides a better understanding of the application of a Knowledge Translation and Knowledge Transfer-based educational intervention on TPB variables including actual engagement in patient-initiated strategies for depression and low mood. In summary, the current study examines the theoretical application of an integrated model of Knowledge Translation, Knowledge Transfer, and TPB in the context of patient-initiated strategies for depression and low mood.

Objectives of the Current Study

There are two primary objectives of the current study. The first objective is to evaluate the utility of TPB for understanding behaviour change in the context of patient-initiated strategies for depression and low mood as well as the extent to which variations in depressed mood affect the key antecedents of TPB on behaviour. This was accomplished by examining the ability of the four TPB antecedent variables (i.e., attitude, subjective norms – significant others, subjective norms – physician, perceived behavioural control) to predict intentions to engage in

nine different patient-initiated strategies for depression and low mood. Subsequently, the study aimed to examine the ability of intentions to predict actual engagement in these behaviours. The second objective of the current study was to examine the impact of applying a Knowledge Translation and Transfer-based educational intervention within a TPB framework. This educational intervention focussed on the nine patient-initiated strategies for depression and low mood being examined and aimed to change attitudes and beliefs (i.e., TPB antecedent variables) for each of these strategies.

Research Questions

Objective 1 – TPB and Patient-initiated Strategies

The first objective of this study is to better understand TPB in the context of patient-initiated strategies for depression and low mood. Research questions related to this first objective are as follows: 1) Do TPB antecedent variables (i.e., attitudes, subjective norms – significant others, subjective norms – physicians, perceived behavioural control) predict intentions in the context of patient-initiated strategies for depression and low mood? 2) Do intentions predict actual engagement in patient-initiated strategies for depression and low mood? 3) Does level of depressive symptoms influence attitudes, subjective norms – significant others, subjective norms – physicians, or perceived behavioural control at the composite or individual strategy levels? 4) Does level of depressive symptoms influence intentions to engage in patient-initiated strategies for depression and low mood? 5) Does level of depressive symptoms impact whether or not an individual engages in patient-initiated strategies for depression and low mood? 6) Does level of depressive symptoms moderate the relationship between intentions and actual behaviour?

Objective 2 – K* and TPB Intervention

The second objective of this study is to examine the impact of an educational intervention based on Knowledge Translation and Transfer principles and applied within the framework of TPB. Research questions related to this second objective are as follows: 1) Does an internet-based, TPB educational intervention based on Knowledge Translation and Knowledge Transfer principles influence ratings of TPB antecedent variables (i.e., attitudes, subjective norms – significant others, subjective norms – physicians, perceived behavioural control) for behaviours related to patient-initiated strategies for depression and low mood? 2) Does an internet-based, TPB educational intervention based on Knowledge Translation and Knowledge Transfer principles influence intentions to engage in patient-initiated strategies for depression and low mood? 3) Will individuals who receive an internet-based, TPB educational intervention based on Knowledge Translation and Knowledge Transfer principles be more likely to engage in patient-initiated strategies for depression and low mood?

Hypotheses

Objective 1 – TPB and Patient-initiated Strategies

Hypotheses related to the first objective of the current study are as follows: 1) Attitudes, subjective norms – significant others, subjective norms – physician, and perceived behavioural control, as measured by ratings of all TPB antecedent variable questions, will uniquely and positively predict intentions to engage in patient-initiated strategies for depression and low mood, as measured by ratings of TPB intentions questions, at a composite level as well as for each individual strategy. 2) Intentions to engage in patient-initiated strategies, as measured by ratings of TPB intentions questions, will significantly predict actual engagement in each of the individual patient-initiated strategies for depression. 3) Level of depressive symptoms, as

measured by the PHQ-9, will significantly change attitudes, subjective norms – significant others, subjective norms – physicians, and perceived behavioural control, as measured by ratings of TPB antecedent variable questions, at the composite and individual strategy levels. 4) Participants with different levels of depressive symptoms, as measured by the PHQ-9, will have significantly different ratings of intentions, as measured by TPB intentions questions. 5) Level of depressive symptoms will impact whether or not an individual engages in patient-initiated strategies for depression and low mood. 6) Intentions to engage in patient-initiated strategies, as measured by ratings of intentions questions, will be more predictive of actual behaviour in groups identified with greater levels of depressive symptoms.

Objective 2 Hypotheses – K* and TPB Intervention

Hypotheses related to the second objective of the current study are as follows: 7) A Knowledge Translation and Transfer-based TPB educational intervention will improve attitudes, subjective norms – significant others, subjective norms – physician, and perceived behavioural control towards these patient-initiated strategies, as measured by composite scores of TPB antecedent variable questions as well as similar scores related to individual patient-initiated strategies, when compared with a neutral sham intervention. In the case of pet therapy where the educational intervention aimed to demonstrate the strategy's lack of effectiveness in managing depressive symptoms, it is hypothesized that the educational intervention will result in lower attitudes, subjective norms – significant others, subjective norms – physician, and perceived behavioural control towards this strategy, as measured by ratings of TPB antecedent variable questions, when compared with a neutral sham intervention. These effects are expected based on the theoretical understanding that if an individual is presented with easily understood, actionable information synthesized from scientific literature, they will learn and retain this information,

which, in turn, will influence their attitudes and beliefs about a topic. 8) A Knowledge Translation and Transfer-based TPB educational intervention will improve intentions to engage in patient-initiated strategies, as measured by composite scores for TPB intentions questions as well as similar scores related to individual patient-initiated strategies, when compared with a neutral sham intervention. In the case of pet therapy, the educational intervention will result in lower intentions to engage in this strategy, as measured by ratings of TPB intentions questions, when compared with a neutral sham intervention. 9) Participants who are exposed to Knowledge Translation and Transfer-based TPB educational interventions for patient-initiated strategies for depression and low mood will engage more in those strategies than participants who were exposed to a neutral sham intervention. In the case of pet therapy, participants who were exposed to the educational intervention will engage less in that strategy than those participants who were exposed to the sham intervention.

Hypothesis Testing

Analytic model. The general analytic plan for the current study was to begin with correlational and regression analyses then examine data with omnibus analyses (e.g., MANCOVAs, structural equation modelling, etc.). These omnibus tests were to be followed by a series of more focussed General Linear Model ANOVAs to identify more specific effects (e.g., within individual patient-initiated strategies, within individual TPB variables). The significant heterogeneity in TPB variable ratings observed between the different patient-initiated strategies for depression and low created difficulties interpreting the results of many of the planned omnibus analyses. It was decided, therefore, to place greater attention on analyses that focussed on variables associated with individual patient-initiated strategies. As a result, a greater number

of analyses than originally planned were conducted. Due to the large sample size, partial eta squared values are presented to demonstrate the effect size associated with significant results.

Objective 1 – TPB and patient-initiated strategies. The first objective of this study is to better understand how TPB functions in the context of patient-initiated strategies for depression and low mood.

Hypothesis 1. (Ratings of all TPB antecedent variables will uniquely and positively predict ratings of intentions to engage in patient-initiated strategies for depression and low mood, at a composite level as well as for each individual strategy.) Analyses for this hypothesis included Pearson's r correlations between TPB antecedent variables and intentions. Linear regression analyses with the antecedent variables in one block as the predictors and intentions as the criterion variable were also conducted. Careful examination of Beta weights and part correlations was an important consideration in the results of the regression analyses.

Hypothesis 2. (Ratings of intentions will significantly predict actual engagement in each of the individual patient-initiated strategies for depression.) Logistic regression analyses for each individual strategy were conducted in order to address this hypothesis. Analyses on composite (i.e., global intentions) scores were not conducted since a composite score for actual behaviour, a dichotomous variable (i.e., yes or no to engagement in one or more of the patient-initiated strategies for depression and low mood), resulted in nearly all participants with a positive response (i.e., yes, engaged in at least one patient-initiated strategy) and, therefore, no variability on which to perform a logistic regression analysis.

Hypothesis 3. (Level of depressive symptoms as measured by the PHQ-9 will significantly change ratings of attitudes, subjective norms – significant others, subjective norms – physicians, and perceived behavioural control at the composite and individual strategy levels.)

In order to provide a response to this hypothesis, Pearson's r correlation analyses between depressive symptoms scores and composite/individual TPB antecedent variables were performed. A mixed model ANOVA for the four TPB antecedent variables at the composite level and at the level of each individual patient-initiated strategy were also conducted including level of depressive symptoms (i.e., minimal, mild, moderate, and moderately severe to severe) as a between subject variable.

Hypothesis 4. (Participants with different levels of depressive symptoms as measured by the PHQ-9 will have significantly different ratings of intentions.) Pearson's r correlation analyses between intentions, at the composite level and at the level of each individual patient-initiated strategy, and depressive symptoms scores were conducted to address this hypothesis. A between subjects ANOVA with a composite intentions score across the four different levels of depressive symptoms scores (i.e., minimal, mild, moderate, and moderately severe to severe) was also conducted. Finally, a mixed model ANOVA with individual strategy scores for intentions across the four different levels of depressive symptoms was performed.

Hypothesis 5. (Level of depressive symptoms will impact the whether or not an individual engages in patient-initiated strategies for depression and low mood.) In order to provide a response to this hypothesis, a Chi-square analysis compared the proportion of participants that indicated actual engagement in a patient-initiated strategy of depression and low mood across the four levels of depressive symptoms. This analysis was conducted for each of the nine patient-initiated strategies for depression and low mood.

Hypothesis 6. (Ratings of intentions to engage in patient-initiated strategies for depression and low mood will be more predictive of actual behaviour in groups identified with greater levels of depressive symptoms.) Moderator analyses with depressive symptom scores as a

moderator between intentions and actual behaviour were conducted for each of the nine patient-initiated strategies for depression and low mood.

Objective 2 – K* and TPB intervention. The second objective of this study is to examine the impact of an educational intervention based on Knowledge Translation and Transfer principles and applied within the framework of TPB.

Hypothesis 7. (A Knowledge Translation and Transfer-based TPB educational intervention will improve composite scores of TPB antecedent variables as well as similar scores related to individual patient-initiated strategies when compared with a neutral sham intervention. In the case of pet therapy where the educational intervention aimed to demonstrate the strategy's lack of effectiveness in managing depressive symptoms, it is hypothesized that the educational intervention will result in lower ratings of TPB antecedent variables scores when compared with a neutral sham intervention.) A mixed model ANOVA comparing the intervention and control group means at baseline and post-intervention was conducted for composite scores as well as scores for TPB variables related to each of the nine patient-initiated strategies in order to address this hypothesis.

Hypothesis 8. (A Knowledge Translation and Transfer-based TPB educational intervention will improve composite scores for intentions to engage in patient-initiated strategies as well as similar scores related to individual patient-initiated strategies when compared with a neutral sham intervention. In the case of pet therapy, the educational intervention will result in lower ratings of intentions to engage in the patient-initiated strategy.) Analyses for this hypothesis included mixed model ANOVAs comparing intervention and control group means at baseline and post-intervention for composite scores as well as individual patient-initiated strategy scores.

Hypothesis 9. (Participants who are exposed to Knowledge Translation and Transfer-based TPB educational interventions for patient-initiated strategies for depression and low mood will engage more in those strategies than participants who were exposed to a neutral sham intervention. In the case of pet therapy, participants who were exposed to the educational intervention will engage less in that strategy than those participants who were exposed to the sham intervention.) Chi square analyses comparing engagement and no engagement in the intervention and control groups were conducted for each individual patient-initiated strategy in order to provide a response to this hypothesis.

Methods

Participants

Recruitment

Participants were recruited from three sources: the University of Ottawa Integrated System of Participation in Research (ISPR) online portal, the Kijiji Ottawa website, and general practitioner offices (i.e., waiting rooms, direct physician referral) at the University of Ottawa and in the community. Participants from the University of Ottawa ISPR system were undergraduate students in the Psychology or Linguistics departments. Participants recruited through the Kijiji website were general internet users and those who were recruited in general practitioner offices were primary care patients. The study was offered in English only. Study advertisements and informed consents were offered in English and French. Advertisements were posted both on the ISPR system and Kijiji websites to recruit participants. In the case of primary care patients, participants were recruited with advertisements in the waiting room or by way of advertisements handed to patients by physicians. Depressive symptoms were not an inclusion criterion although individuals with possible depressive symptoms were encouraged through advertisements and

physician recruitment to participate. Children and senior adults (65 years of age or older) were excluded from participation as the presentation of depression in these populations varies significantly from that of an adult population (APA, 2000). Participants recruited through the Kijiji website or through their general primary care physician's office were eligible to be entered in a draw to win various gift certificates as compensation for their time. Undergraduate students were awarded with percentage points towards their final course grades as compensation for participation in accordance with ISPR system regulations.

Survey Completion Time Limitation Criterion

The survey system recorded the amount of time participants remained on each individual webpage of the survey and interventions. Following expert consultation (Huta, 2013), a three second minimum per question was established as the criterion for participant data to be included in analyses. Because students, Psychology students in particular, may have had exposure to the PHQ-9 depressive symptoms measure and the Locus of Health Control measure, the time limitations were not applied to these measures. The time limitations were also not applied to the baseline TPB questions, which were developed in table format for ease of use. The time limitation was applied to the first webpage of the intervention stage and the first webpage of the follow-up stage. Specifically, this included the first pages of the educational intervention and post-intervention TPB questions for psychoeducation for the intervention group or the first pages of the sham intervention and post-intervention TPB questions for psychoeducation for the control group. Thirteen participants were removed from the study for violating the time limitation criterion.

Attrition

See Figure 3 for a visual representation of attrition in the current study. The informed consent prompted participants to close their browser window if they desired to withdraw from the study. As a result, all participants who closed their browser windows prior to completion of either phase of the study (i.e., part 1 or follow-up) were assumed to have withdrawn from that phase of the study. Data from participants who completed part 1 but did not complete the follow-up were used for analyses related to part 1.

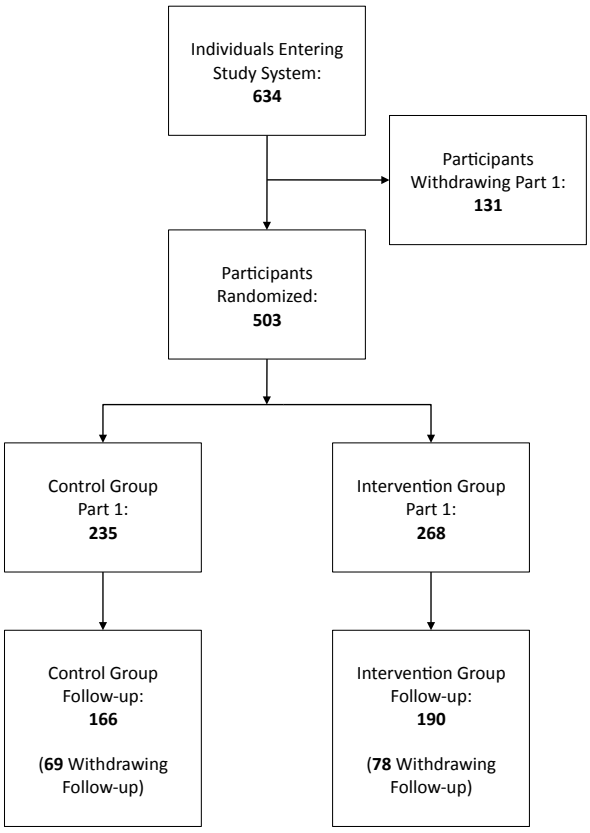

Figure 3. Participant flow and attrition from recruitment to completion.

The website offered a more detailed description of the study and a link for entry into the study system. Six hundred and thirty-four individuals entered the study website and consented to participate. A total of 131 participants withdrew before completing part 1 and were not randomized. The remaining 503 participants were randomized. Two hundred and thirty-five participants were assigned to the control group and 268 were assigned to the intervention group. Sixty-nine participants in the control group and 78 participants in the intervention group did not complete the follow-up phase of the study. A total of 356 participants completed the study in its entirety, 166 in the control group and 190 in the intervention group.

Study Sample

Data from 503 participants were analyzed for hypotheses related to part 1 of the study and data from 356 participants were analyzed for hypotheses related to the follow-up. In the total sample, three hundred ninety-seven (78.9%) of the participants were women and 106 (21.1%) were men. The age of participants ranged from 17 to 57 years (M = 20.7, SD = 5.9). The range of baseline depressive symptoms scores based on the PHQ-9 depressive symptoms measure was 0 to 23 (M = 8.0, SD = 5.3). Men and women in the sample did not significantly differ with respect to age or depressive symptoms scores. This finding is not surprising given recruitment material targeted individuals who were stressed or who were experiencing low mood. Approximately one third of participants (32.0%) rated their level of depressive symptoms as minimal (score range 0-4) and another third (33.8%) rated their depressive symptoms as mild (score range 5-9). The majority of the remaining participants rated themselves as having a moderate (score range 10-14) level of depressive symptoms (20.7%). A tenth of the sample (10.9%) reported depressive

symptoms falling in the moderately severe range (score range 15-19) and 2.6% scored in the severe range (score range 20-27).

Sample differences. The vast majority of participants were undergraduate Psychology and Linguistics students at the University of Ottawa (85.1%) recruited through the ISPR online portal. No distinction was made between students in the Psychology department and students in the Linguistics department at the data collection phase. The remaining participants were recruited through the Ottawa Kijiji website (11.7%) and the general practitioners' offices (3.2%). A one-way between subjects ANOVA revealed a significant difference in age between the three groups, $F(2, 500) = 49.5$, $p < .001$. Pairwise comparisons suggested that the Kijiji sample (M = 26.6 years, SD = 10.2 years) was significantly older than the undergraduate sample (M = 19.7 years, SD = 4.1 years), $t(60.6) = 5.2$, $p < .001$. The general practitioners' offices sample (M =25.3 years, SD = 9.2 years) was also found to be significantly older than the undergraduate sample, $t(15.2) = 2.4$, $p < .05$. The Kijiji sample and the general practitioners' offices sample did not differ from one another with regard to age, $t(73) = .46$, $p = .65$. There was no difference between the three groups on depressive symptoms scores, $F(2, 500) = 2.6$, $p = .074$. The Kijiji sample was found to have a greater proportion of men than the other two samples, $\chi^2(2) = 8.8$, $p < .05$. While some differences were noted, these samples of convenience were believed to have more similarities than differences. Therefore, for the purposes of all analyses, the three samples were analysed as one.

Control and intervention group differences. Forty-six percent (46.7%) of the sample was randomized to the control group with the remainder (53.3%) assigned to the intervention group. Results of an independent samples t-test suggested that the intervention group (M = 21.3 years, SD = 6.6 years) was significantly older than the control group (M = 19.9 years, SD = 4.7

years). The difference in age, although statistically significant, was considered to be marginal and was not expected to significantly influence the results of the current study. Control and intervention groups did not differ significantly on depressive symptoms measure scores and had similar proportions of men and women. Control and intervention group participants also had similar ratings of locus of mental health control and did not differ significantly on subscale scores related to internal, chance, physician, or other locus of mental health control, $p > .05$.

Completers and part 1-only participant differences. While 356 (70.8%) of the overall sample completed the study in its entirety (i.e., part 1 and the follow-up), a minority of participants, 147 (29.2%), completed part 1 but failed to complete the follow-up. While analyses revealed no significant differences between the completers and the part 1-only participants with regard to age and scores on the depressive symptoms measure, the part 1-only group had a significantly greater proportion of men than the completers group, $\chi^2(1) = 4.7$, $p < .05$. Since analyses revealed no meaningful differences between men and women on the variables relevant to the current study, differences in these group compositions were determined to be of little concern.

Completers control and intervention group differences. Of the 356 participants who completed the study in its entirety, 166 (46.6%) were in the control group and 190 (53.4%) were in the intervention group. As with the overall sample, those participants who competed the study in its entirety and were in the intervention group were significantly older ($M = 21.5$ years, $SD = 6.9$ years) than those participants in the control group who completed the study ($M = 19.5$ years, $SD = 3.4$ years), $t(291.3) = 3.5$, $p < .01$. Once again, although statistically significant, the difference in age between these two groups was not seen as meaningful and therefore was not considered as an explanation for differences observed in later analyses. Participants in both the

control group and the intervention group who completed the study in its entirety did not differ significantly on scores on the depressive symptoms measure and the proportion of men to women was similar.

No perceived depression. During part 1 data collection for TPB variables, when intentions for a particular patient-initiated strategy were identified as low participants were prompted to explain briefly why their intentions were low for that patient-initiated strategy. These questions were posed to both control and intervention groups following the experimental portion of part 1 of the study (i.e., following the educational intervention or the sham intervention). One hundred and fifty-seven participants (31.2%) of the overall sample indicated that their low intention to engage in one of the patient-initiated strategies was due to lack of perceived depressive symptoms. For analyses related to TPB variables, and intentions in particular, participants who rated intentions low due to a lack of perceived depressive symptoms were removed from analyses. Where the intentions were not implicated in analyses (e.g., Hypothesis 3), the full sample was used. Since TPB is only applicable to persons who believe a behaviour is relevant to their current situation, participants who do not believe they have depressive symptoms are not likely to rate intentions to engage in patient-initiated strategies for depression and low mood high regardless of their attitudes and beliefs, positive or negative, towards these strategies. Including these participants in analyses involving intentions was believed to confound the relationship of the variables among participants who identified patient-initiated strategies for depression and low mood as relevant to their current situation. Three hundred and forty-six participants (68.8%) of the total sample did not indicate that they lacked perceived depressive symptoms necessary to engage in patient-initiated strategies for depression and low mood.

Materials

The Optimizing Outcomes Website

Through the domain name OptimizingOutcomes.net, an online survey system was used to collect data during the part 1 and the follow-up phases of the study. This online system also delivered the Knowledge Translation and Knowledge Transfer-based TPB educational intervention for patient-initiated strategies for depression and low mood as well as the sham intervention. The online survey system was secure and permitted the confidential storage of participant information and study data.

Educational Interventions for Patient-Initiated Strategies

Positive educational interventions. Various evidence-based sources (Anderson et al., 2005; Jorm et al., 2002; McKendree-Smith et al., 2003; Patten et al., 2006), expert consultation, and Knowledge Translation principles were used to develop five types of information for each of eight patient-initiated strategies for depression and low mood. These types of information included a) an adequate description of the strategy, b) the scientific evidence that demonstrates the strategy's efficacy or effectiveness in reducing depressive symptoms, c) the scientifically supported mechanisms for the strategy's demonstrated efficacy, d) evidence-based recommendations on applying the strategy in day-to-day life, and e) which professional organizations recommend the use of the strategy for reducing depressive symptoms. Accompanying this information were brief directions on how to access the various strategies (e.g., a bookstore website link for the recommended self-help book). As mentioned previously, these types of information were selected specifically to effect change on each of the TPB antecedent factors (i.e., attitude, subjective norms – significant others, subjective norms – physician, perceived behavioural control), which in turn were expected to have an effect on

intentions and ultimately actual engagement in the strategy behaviour. The eight patient-initiated strategies for depression encouraged in this study were bibliotherapy, exercise, light therapy, adherence to medication prescription, psychoeducation, psychotherapy, social support, and symptom monitoring. The information presented in the educational intervention for each of these patient-initiated strategies can be viewed at appendix A. A short preamble on the benefits of and evidence supporting patient-initiated strategies for depression and low mood in general is offered to participants in the intervention group before the educational intervention was presented. This preamble can also be viewed at appendix A.

Negative educational intervention. In the case of pet therapy, a behaviour often believed to be an effective patient-initiated strategy for reducing depressive symptoms despite a lack of scientific evidence supporting this claim, the educational intervention aimed to dissuade participants from engaging in this behaviour for the purpose of improving mood. Using the same types of information that were the focus of the positive educational intervention, the negative educational intervention a) provided a description of pet therapy, b) described the scientific evidence that demonstrates pet therapy's ineffectiveness in reducing depressive symptoms, c) outlined the mechanisms of pet therapy falsely believed to reduce depressive symptoms, and d) provided a list of the professional organizations that do not recommend the use of pet therapy for reducing depressive symptoms. The information presented in the educational intervention for Pet Therapy can be viewed at appendix B. A short preamble describing the ineffectiveness of some behaviours thought to reduce depressive symptoms was offered to participants in the intervention group before the negative information related to pet therapy was presented. This preamble can also be viewed at appendix B.

Sham Interventions for Control Group

In order to control for expectancy bias and other effects, a sham intervention was created for the control group. The sham intervention was intended to be similar in nature to the educational intervention (i.e., a paragraph of text preceding the second set of TPB questions) but was designed to be neutral in its impact on TPB variables. In order to achieve this goal and to obtain relative consistency between the nine different sham interventions (i.e., one for each of the patient-initiated strategies for depression and low mood), Wikipedia excerpts detailing some historical aspect of the behaviour (e.g., history of the light bulb for light therapy) were presented to control group participants. The excerpts were carefully chosen so as to remain neutral in their impact on TPB variables. A short preamble was presented before the sham interventions asking participants to read the paragraphs related to the history of the different patient-initiated strategies. The Wikipedia source was identified at the end of each of sham interventions. The content of these sham interventions, as well as the preamble, can be viewed at appendix C.

Measures

Demographics

All participants were asked to complete a series of demographic questions including age and gender. Each participant's recruitment source (i.e., University of Ottawa ISPR, Ottawa Kijiji website, general practitioners' offices) was identified as part of the informed consent process. In order to keep the questionnaire at a reasonable length, additional demographic questions such as socioeconomic status and cultural background were not included in the current study.

Depression

The depressive symptoms questionnaire used in this study was the Primary Health Questionnaire depression scale (PHQ-9) developed by Kroenke, Spitzer, and Williams (2001).

The PHQ-9 is a nine-item self-report measure used principally in primary care settings to determine severity of depressive symptoms based on relevant criteria. This measure has been thoroughly tested for psychometric properties (e.g., Kroenke, et al., 2001; Wittkampf et al., 2009). Cameron, Crawford, Lawton, and Reid (2008) reported an internal consistency Cronbach's alpha ranging from .83 to .92 in a sample of primary care patients referred to mental health specialists. In the same sample, Cameron and colleagues (2009) reported strong convergent reliability with a similar measure of depressive symptom severity ($r = .68$, $p < .001$). The PHQ-9 has also been shown to have strong construct validity correlating strongly with a comparable measure of depressive symptom severity (r - .71, $p < .01$) when administered using a computer (Fann et al., 2009).

Sample items of the PHQ-9 include "Over the past two weeks, how often have you been feeling tired or having little energy?" and "Over the past two weeks, how often have you been moving or speaking so slowly that other people could have noticed?" Responses are made on a four-point Likert-type scale ranging from "0 – Not at all" to "3 – Nearly every day." Total scores range from 0 to 27. Based on analyses conducted by Kroenke and colleagues (2001), scores between 5 and 9 indicate mild depression, scores between 10 and 14 indicated moderate depression, scores between 15 and 19 indicated moderately severe depression, and scores greater than 20 indicate severe depression. A diagnosis of major depression was more often appropriate with patients who scored 15 or higher on the PHQ-9 (Kroenke et al., 2001).

For the purpose of this study, item nine of the PHQ-9, which measures suicidal ideation ("Over the past two weeks, how often have you had thoughts that you would be better of dead or hurting yourself in some way?") was not included in the questionnaire package. If a participant endorsed this item at home, an attending physician would not be made aware and would

therefore be unable to intervene. This scenario raises issues of liability. Since endorsement of the suicidal ideation item is infrequent (e.g., Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006; Williams, Heinemann, Bode, Wilson, Fann, & Tate, 2009), a decision was made to keep the same cut scores for the 8-item adaptation of the PHQ-9. Given that suicidal ideation is infrequently reported, prorating cut scores because of the removed suicidal ideation item would likely inflate the detection of all levels of depressive symptom severity. The adapted PHQ-9 can be viewed at appendix D.

Locus of Health Control Scale

Form C of the Multidimensional Health Locus of Control Scale (MHLC Scale) is an 18-item, self-report measure that assesses where an individual places responsibility (self, doctors, others, or chance) for the improvement of a specific health condition (Wallston, Wallston, & DeVellis, 1978; appendix E). Unlike other forms of the MHLC, form C is intended to be modified to assess health locus of control for any current medical condition simply by replacing the word "condition" in the original form of the scale with the name of the condition being examined. For purpose of this study, the words "mental health" replaced the word "condition." The internal and chance health locus of control subscales contain six items each and the doctors and powerful others subscales contain three items each. This measure is considered psychometrically sound. Moderate significant correlations ranging from $r = 0.65$ to $r = 0.55$ with similar scales on form B of the MHLC Scale suggest high concurrent validity (Wallston, Stein, & Smith, 1994). Furthermore, interventions that targeted internal health locus of control, for example, resulted in higher ratings of internal control after intervention than before intervention on form C. Internal consistencies were determined to be at least a Cronbach's alpha of 0.70 and

test-retest reliability was within expected ranges given the tendencies of health locus of control to shift, particularly over extended periods of time (Wallston, Stein, & Smith, 1994).

Respondents for the MHLC Scale - Form C are asked to rate their level of agreement with various statements. The same six responses are available for each statement and range from "Strongly Disagree" to "Strongly Agree." Higher subscale ratings indicate a greater belief in the influence of the subscales respective locus of control. No overall global score is derived from this measure.

Open Response Prior Knowledge Question

A brief open response question was presented aiming to determine each participant's prior knowledge regarding patient-initiated strategies for depression and low mood. Although this question is not directly related to any of the hypotheses of the current study, responses to this question provided a context to better understand participant ratings of attitudes and beliefs towards evidence-based strategies for patient-initiated strategies for depression and low mood. The following text was presented along with a text box in which the participants could provide a respond in writing: "We would like to know what strategies you are currently familiar with that might be used to deal with or treat sad or depressed mood. You are likely to be familiar with medication or counselling, as well as many other self-help strategies. Please list, in point form, any and all strategies that you believe are effective in helping deal with sad or depressed moods."

Theory of Planned Behavior Questions

Since no developed measures investigating TPB variables have been developed, TPB measures were created specifically for the purpose of the current study according to previously developed questionnaires of this nature as well as expert recommendation (Francis et al., 2004). Baseline and post-intervention versions of TPB questions were developed. A total of five distinct

TPB questions were created in order to obtain ratings for 1) attitude towards a behaviour, 2) subjective norms of significant others (i.e., family and friends), 3) subjective norms of physicians, 4) perceived behavioural control, and 5) intention to engage in a behaviour. Baseline TPB questions (appendix F) were organized in five tables, one table for each of the TPB questions. Participants were asked to rate their response to each question on a 7-point Likert scale with anchor descriptions for each of the nine patient-initiated strategies for depression and low mood examined in this study. Minimal information regarding these strategies was provided with the baseline TPB questions.

Post-intervention TPB questions (appendix G, intervention, and appendix H, control) each immediately follow the Knowledge Translation and Knowledge Transfer-based TPB educational interventions or the sham interventions provided for each of the nine patient-initiated strategies for depression and low mood. On a single page, participants were presented with the educational intervention or the sham intervention related to one strategy immediately followed by the five TPB questions related to that strategy. The wording of post-intervention TPB questions, and Likert scale anchors, was identical to that of the baseline TPB questions with the exception of a preface to each question that asks the participant to consider the evidence that supports the use of the strategy, in the case of the intervention group, or to consider the paragraph that was just read (i.e., the sham intervention), in the case of the control group. Additionally, the intervention group was provided with brief directions on how to access each patient-initiated strategy within the perceived behavioural control question (e.g., a bookstore link to the recommended self-help book). Post-intervention TPB questions were presented the same way across all nine patient-initiated strategies for depression and low mood.

Follow-up Questionnaires

Participants were presented with a second survey two to three weeks following their initial participation. Following a short introduction, all participants were asked to complete the adapted PHQ-9, the locus of health control questionnaire, the open-response question regarding knowledge of patient-initiated strategies for depression, a series of questions regarding frequency and experience related to actual engagement in the nine patient-initiated strategies for depression and low mood, and a third set of TPB questions identical to those presented at baseline.

Research Design

This study was conducted as a mixed design randomized controlled trial. Participants were randomly assigned to the control or intervention group using a randomization function that was integrated into the online survey system. The independent variable, receiving or not receiving Knowledge Translation and Knowledge Transfer-based TPB educational intervention for patient-initiated strategies for depression and low mood, was manipulated between the control group and the intervention group allowing for between group analyses. Baseline as well as follow-up data resulted in a variety of repeated measures allowing for within group analyses. Although random assignment of participants and manipulation of the independent variable (i.e., exposure to the educational intervention) took place in the experimental aspect of this proposed study, monitoring and control over extraneous variables was limited.

Procedure

Recruitment

Advertisements were posted on the University of Ottawa ISPR online portal as well as the Kijiji Ottawa website. Recruitment from the general practitioners' offices occurred through the family physicians themselves, who gave potential participants a study advertisement card, or

by way of potential participants retrieving a study advertisement card in the office's waiting room. Potential participants chose to direct themselves to the study website (i.e., www.OptimizingOutcomes.net) indicated on advertisements with no further prompting from researchers or physicians. Participation remained confidential throughout and physicians had no knowledge of their patients' participation in the study.

Study Entry and Informed Consent

Individuals who received study information through advertisements, on their own initiative, visited the www.OptimizingOutcomes.net website. Upon entry to the survey system website through a "Register" button, individuals were presented with an informed consent to participate in the study. If an individual did not provide consent to participate, they were automatically removed from the website (i.e., they were directed to an exit webpage and prompted to close their browser window). If an individual provided electronic consent to participate, they were prompted to identify their population-affiliation (i.e., University of Ottawa ISPR student, Kijiji Ottawa user, patient) and were prompted to enter their telephone number and email address. This information was stored on a secure server. Assurances regarding confidentiality were made in the informed consent and when entering contact information. Contact information was required for email, or telephone, alerts and prompts to complete the follow up survey.

Part 1 Data Collection

Following informed consent and contact information collection, participants were presented with a series of demographic questions. Next, all participants completed the depressive symptoms measure. All participants, regardless of level of depressive symptoms, were eligible to participate in the study. Following completion of the depressive symptoms measure, participants

were randomized into the control and intervention groups although the two groups are not differentiated until the intervention stage of part 1. Randomization occurred at this step due to an earlier iteration of the study that randomized participants based on level of depressive symptoms; however, this type of blocked randomization was not used in the study's final form and all participants regardless of level of depressive symptoms had an equal possibility of being assigned to the control or intervention group. Following randomization, all participants completed the locus of health control measure and went on to complete the open-response question asking them to explain their current knowledge regarding patient-initiated strategies for depression and low mood. Following completion of this one-item questionnaire, all participants were prompted to complete the baseline TPB questions. After completing the baseline TPB questions in table format, control and intervention group participants were directed to the intervention stage of part 1.

Participants in the control group were directed to the sham intervention immediately after completing the baseline TPB questions. Control group participants were offered a brief preamble explaining that they would be asked to read a small paragraph related to the history of each patient-initiated strategy. Control group participants were then presented with the Wikipedia historical paragraph related to each of the nine patient-initiated strategy for depression and low mood and then were prompted to complete the post-intervention TPB questions. After completing the intervention stage of part 1, control group participants were asked to choose two of the nine patient-initiated strategies for depression or low mood to engage in over the following two- to three-week period. Upon selecting two patient-initiated strategies, control group participants were thanked for their continued participation and informed that they will be contacted again in two to three weeks. They are then exited from the website.

After completing the baseline TPB questions, participants in the intervention group were presented with a brief text introducing patient-initiated strategies for depression and low mood. They were then presented with the Knowledge Translation and Knowledge Transfer-based TPB educational intervention for each of the nine patient-initiated strategies in turn, each of which was followed immediately by respective post-intervention TPB questions. After completing these questions, intervention group participants were also asked to choose which two of the nine patient-initiated strategies for depression and low mood they intend to try over the next two- to three-week period. While this set up an expectation that participants would be asked again about these behaviours, this experimental intervention is meant to mimic a similar intervention in primary care settings or public health campaigns in which these behaviours would be encouraged and, ideally, followed up. Participants were then thanked, informed that they will be contacted again in two to three weeks, and exited from the website.

Follow-up Data Collection

All participants were contacted through email by the researchers and asked to click on a hyperlinked text in the email that returned them to the study website to complete the follow-up survey. If participants who completed part 1 of the study did not complete the follow-up survey within 24 hours of receiving the first email prompt, additional emails were sent in a similar manner to a total of seven email prompts. After the seventh email prompt, participants were no longer contacted although their account remained opened for them to access the follow-up survey. In the follow-up survey, participants were presented again with the depressive symptoms measure, the locus of health control measure, and the open-response question regarding the participant's knowledge of patient-initiated strategies for depression and low mood. The participants were then asked a series of questions regarding their experiences with the

nine patient-initiated strategies for depression and low mood over the past two to three weeks. Following these questions, all participants completed a third set of TPB questions, identical to those presented at baseline in part 1 of the study. Following completion of these questions, all participants were thanked for their participation and, if eligible, asked if they wished to be entered in the draw to win a gift certificate. Participants were then exited from the study. Students registered in the ISPR system were granted course credits by the researcher as per ISPR guidelines.

Analyses

Screening and Cleaning

Screening and cleaning of the dataset was completed in accordance with common practices (Tabachnik & Fidell, 2007). Since incomplete surveys coincided with the closing of a browser window by a participant, the suggested action for withdrawal from the study, no missing data was present in the current study. Where surveys were found not to be completed by participants, all data was removed from that phase of the study (i.e., part 1 or the follow-up).

Prior to performing analyses, the following assumptions were tested: equal sample sizes, multivariate normality, absence of outliers, homogeneity of variance-covariance matrices, linearity, homogeneity of regression, reliability of covariate, sphericity, and absence of multicollinearity and singularity (Tabachnik & Fidell, 2007). Where the assumption of sphericity was violated in ANOVA analyses, the Greenhouse-Geisser correction was applied. For any multivariate analyses involving the Intentions variables, multivariate outliers were removed. In the case of the baseline TPB variables, a total of 43 participants were identified as multivariate outliers and were removed from multivariate analyses. Since the majority of multivariate analyses included the Intentions variable, multivariate outliers were determined using only those

participants who did not identify a lack of depressive symptoms as a reason for low intentions to engage in patient-initiated strategies for depression and low mood (as described in the Methods – Participants section).

Due to the exploratory nature of the current study, the decision was made to not control for study-wide error through Bonferroni correction or other methods. As a result, all analyses were tested for significance at the $p < .05$ level. Nevertheless, in the majority of instances where significance was observed, p values were found to be less than .01 or .001. Given the large number of analyses, caution is recommended when interpreting the results of analyses where significance approaches the .05 level.

Results

Descriptive Statistics

Open-response Self-management Knowledge

Qualitative responses from 480 participants were analyzed for the descriptive statistic purposes (data for 23 participants was not recorded for the open response question due to a technical malfunction with the survey system). Participants identified an average of two patient-initiated strategies for depression and low mood each and the number of strategies identified by each participant ranged from none to 11. A total of 43 different strategies were identified. Two hundred forty-two participants (50.4%) did not identify any patient-initiated strategies. These participants remained on the webpage that contained the open-respond question for a period of time, on average (M = 124.8 seconds, SD = 158.3 seconds), similar to that of participants who did respond to the question (M = 159.3 seconds, SD = 238.9 seconds), $t(410.7) = 1.8$, $p = .063$.

As indicated in Table 1, evidence-based patient-initiated strategies for depression and low mood were among the most frequently mentioned of all strategies. One hundred and sixteen

participants (24.2%) mentioned exercise as a patient-initiated strategy for depression and low mood. Over a fifth of participants (22.9%) mentioned social support from friends and family as a strategy. Therapy (17.7%) and medication (13.1%) were also mentioned frequently. Light therapy (1.7%), education (.6%), and self-help books (.2%) were infrequently mentioned. Socializing (i.e., visiting and engaging in various activities with friends and family, not necessarily for social support purposes; 14.8%) was the most common other strategy that was identified by participants. Engaging in various enjoyable activities including listening to music (9.0%), reading (5.0%), watching television or a movie (4.8%), meditation (4.4%) and a variety of other (7.7%), and unspecified enjoyable activities (14.8%) were also frequently mentioned. Healthy living strategies including dieting or eating healthy (10.0%), self-reflection (9.4%), sleep (7.7%), and positive thinking (7.3%) were also frequently mentioned by participants. Distraction or avoidance (6.4%), eating junk food (2.5%), pet therapy (2.1%), and a variety of other less helpful strategies were mentioned less frequently.

Table 1
Frequency of participants and percentage of sample mentioning different patient-initiated strategies for depression and low mood and other strategies. n = 503

	Mentions of strategy	
Strategy	*f* of participants	% of sample
Evidence-based strategy		
Exercise	116	24.2
Social support	110	22.9
Therapy	85	17.7
Medication	63	13.1
Light therapy	8	1.7
Education, Self-help books	4	.8
Enjoyable activity		
Socializing	71	14.8
Unspecified	57	11.9
Listen to music	43	9.0
Reading	24	5.0
Watch TV or a movie	23	4.8
Meditation	21	4.4
Other (Artistic expression, Cooking, Playing a musical instrument, Being in nature, Dancing, Shopping, Showering, Sex)	37	7.7
Health living strategy		
Healthy eating	48	10.0
Self reflection	45	9.4
Sleep	37	7.7
Positive thinking	35	7.3
Getting organized	18	3.8
Relaxation	17	3.5
Faith-related activities	10	2.1
Pet Therapy	10	2.1
Other (Relaxation exercises, Vitamins, Work breaks, Abstaining from drugs/alcohol, Reducing stress, Staying hydrated)	23	4.8
Other strategies		
Distraction or avoidance	31	6.4
Eating junk food	12	2.5
Other (Retail therapy, Crying, Smoking marijuana, Alcohol, Self-injury)	10	2.1

The results suggest that less than half of participants were able to readily identify patient-initiated strategies for the self-management of depression and low mood. Half of the participants who did identify self-management strategies mentioned evidence-based patient-initiated strategies. Many of the other strategies noted are related to general health living and are not specific to managing depression or low mood.

Theory of Planned Behavior Variable Ratings

Global scores. Composite scores for the four TPB antecedent variables and Intentions were calculated and compared (See Figure 4.). When participants were asked to indicate the degree to which they believed the strategies could be effective in improving depressed or sad mood (i.e., Attitudes) using the 1 (*not effective at all*) to 7 (*extremely effective*) Likert scale, the average score across all nine strategies was 4.9 (*SD* = .77). The mean Subjective Norms – Significant Others rating, related to the degree to which participants thought their significant other, friends, or family members believed different patient-initiated strategies for depression and low mood were effective in improving mood using the 1 (*they don't believe this at all*) to 7 *(they very much believe this*) Likert scale, was similar at 4.9 (*SD* = .88). The average rating of the degree to which participants thought their family physician believed patient-initiated strategies for depression and low mood were effective in improving mood (i.e., Subjective Norms – Physician) using the 1 (*my doctor doesn't believe this at all*) to 7 (*my doctor very much believes this*) Likert scale was determined to be 5.3 (*SD* = .92). When participants were asked to indicated their Perceived behavioural control for the strategies investigated, as measured using the 1 (*not at all able*) to 7 (*fully able*) Likert scale, the mean rating was 4.9 (*SD* = .99). Finally, the average rating of Intentions, using the 1 (*I have no intention of doing this*) to 7 (*I will try this in the next 2*

to 3 weeks) Likert scale, across the nine patient-initiated strategies for depression and low mood was found to be 4.2 *(SD* = 1.0).

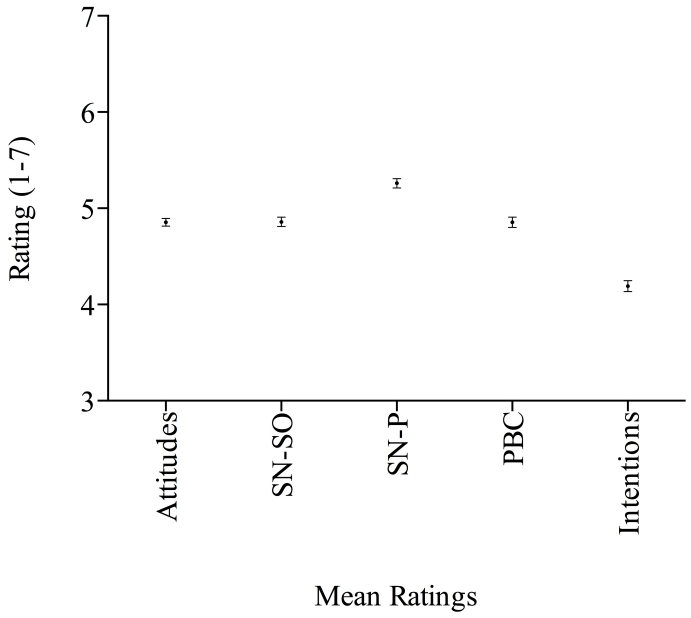

Figure 4. Mean scores of Theory of Planned Behavior antecedent variables and Intentions across the nine patient-initiated strategies for depression and low mood. Error bars represent the standard error of the mean (*SEM*). (Note: SN-SO = Subjective Norms – Significant Others, SN-P = Subjective Norms – Physicians, PBC = Perceived Behavioural Control), *n* = 346

A repeated measures ANOVA revealed that some of the ratings of TPB antecedent variables and Intentions at the composite level were significantly different from each other, $F(3.4, 1160.0) = 105.4$, $p < .001$, $\eta_p^2 = .23$. Post-hoc analyses indicated that the average rating of Subjective Norms – Physician was significantly greater than the ratings of all of the other variables in TPB model, $p < .001$. The mean Intentions score was found to be significantly lower than the ratings of all other variables, $p < .001$. Attitudes, Subjective Norms – Significant Others, and Perceived Behavioural Control were all rated similarly at the composite level. These results suggest that, in general, participants rated their physician's attitude towards patient-initiated strategies for depression and low mood as more favourable than their own or those of their

significant others, and also rated their physician's attitude higher than their own perceived control over these strategies in general. Intentions were rated to be significantly lower than all attitudes and beliefs.

Attitudes. Ratings of attitude (i.e., perceived effectiveness) towards the patient-initiated strategies for depression and low mood differed significantly between strategies, $F(6.9, 3475.7) = 141.5$, $p < .001$, $\eta_p^2 = .22$. As represented in Figure 5, when participants were asked to indicate the degree to which they believed a specific strategy could be effective in improving depressed or sad mood, Exercise ($M = 5.9$, $SEM = .06$) was rated significantly more effective than all other strategies, $p < .001$. The strategy rated the second most effective among participants was Social Support ($M = 5.6$, $SEM = .06$) followed by Psychotherapy ($M = 5.3$, $SEM = .06$), Pet Therapy ($M = 5.1$, $SEM = .07$), and Psychoeducation ($M = 4.9$, $SEM = .06$) each of which was rated significantly different from the others, $p < .05$-$.001$. Light Therapy ($M = 4.7$, $SEM = .07$) and Symptom Monitoring ($M = 4.6$, $SEM = .06$) were rated similarly by participants. Finally, participants rated Medication ($M = 4.2$, $SEM = .08$) significantly lower than all other strategy followed by Bibliotherapy ($M = 3.5$, $SEM = .07$), $p < .001$, which was rated significantly lower than Medication, $p < .001$. A significant interaction between Attitudes and gender was observed, $F(6.9, 3465.9) = 2.3$, $p < .05$. Post-hoc analyses revealed that women rated the perceived effectiveness of Pet Therapy (i.e., attitude; $M = 5.3$, $SEM = .08$) significantly higher than men ($M = 4.6$, $SEM = .17$), $t(501) = 3.55$, $p < .001$. The results suggest that attitudes towards patient-initiated strategies for depression and low mood vary considerably between the strategies themselves. These results suggest that attitudes are dependent on the specific behaviour (e.g., exercise, socializing, symptom monitoring) and not on the function of the behaviour (i.e., improving mood).

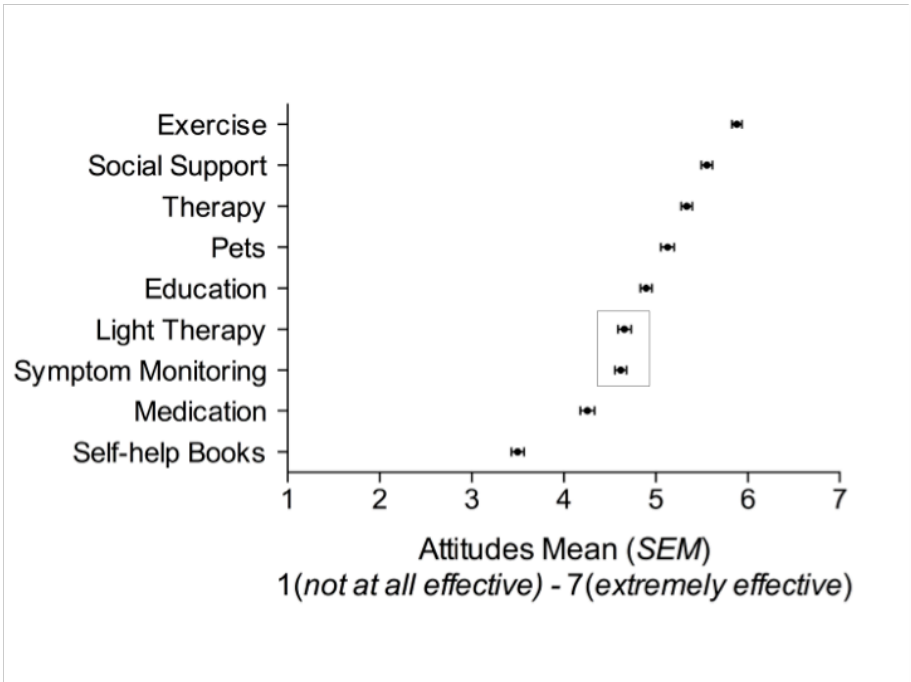

Figure 5. Average Attitudes rating for each of the nine patient initiated-strategies for depression and low mood. Anchors on the 7-point scale represent degree of response to the question "To what degree do you believe that (patient-initiated strategy for depression and low mood) could be an effective strategy for improving sad or depressed moods?" Error bars represent the standard error of the mean (*SEM*). Data points determined to be not statistically different from one another are enclosed in a box. $n = 346$

Subjective Norms – Significant Others. Ratings related to the degree to which participants thought their significant other, friends, or family members believed different patient-initiated strategies for depression and low mood were effective in improving mood varied significantly between strategies, $F(6.9, 3456.7) = 84.6$, $p < .001$, $\eta_p^2 = .14$ (Figure 6). Exercise ($M = 5.7$, $SEM = .06$) was rated significantly greater, $p < .001$, than all other strategies with the exception of Social Support ($M = 5.6$, $SEM = .06$). The strategy with the third highest rating for Subjective Norms – Significant Others was Therapy ($M = 5.3$, $SEM = .07$) followed, significantly, by Education ($M = 4.9$, $SEM = .07$), $p < .001$. Medication ($M = 4.7$, $SEM = .09$), Symptom Monitoring ($M = 4.6$, $SEM = .07$), and Pet Therapy ($M = 4.6$, $SEM = .09$) were rated

similarly and all significantly lower than Education, $p < .05$. Light Therapy ($M = 4.3$, $SEM = .08$) was rated significantly lower than Pet Therapy and Bibliotherapy ($M = 3.9$, $SEM = .08$) was rated significantly lower than Light Therapy and all other strategies, $p < .001$. There was no significant interaction between Subjective Norms - Significant Others and gender, $F(6.9, 3449.8) = 1.4$, $p = .21$. As with attitudes, the results of these analyses suggest that subjective norms for these strategies differ significantly based on specific behaviour.

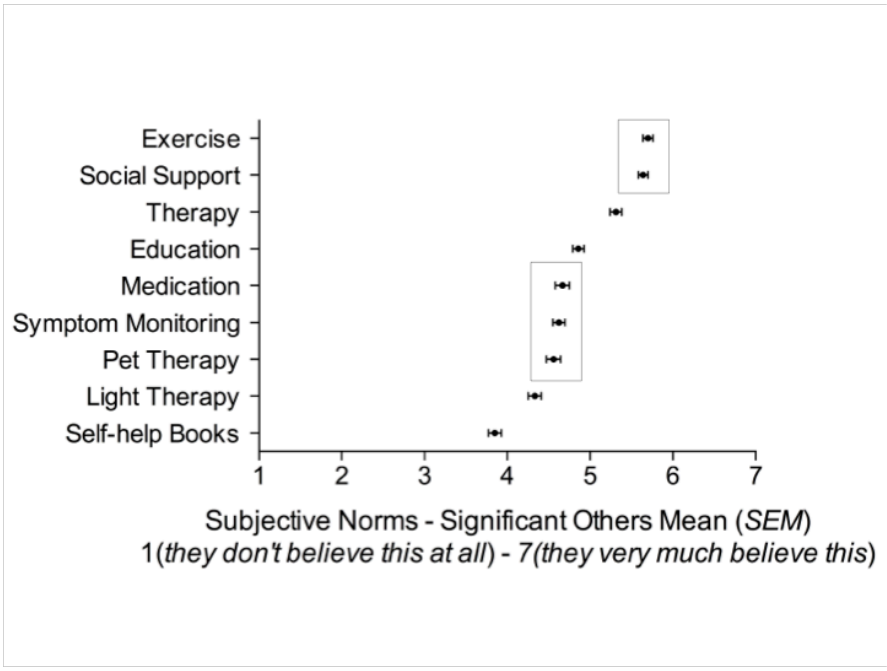

Figure 6. Average Subjective Norms – Significant Others rating for each of the nine patient initiated-strategies for depression and low mood. Anchors on the 7-point scale represent degree of response to the question "To what degree do you think that your significant other, friends or family believe that (patient-initiated strategy for depression and low mood) could be an effective strategy for improving sad or depressed moods?" Error bars represent the standard error of the mean (*SEM*). Data points determined to be not statistically different from one another are enclosed in a box. $n = 346$

Subjective Norms – Physician. Participant ratings of the degree to which they thought their family physician believed patient-initiated strategies for depression and low mood were effective in improving mood varied significantly across the nine self-help strategies investigated,

$F(6.5, 3282.3) = 170.1$, $p < .001$, $\eta_p^2 = .25$ (Figure 7). Exercise ($M = 6.1$, $SEM = .05$) was rated as the strategy that participants most strongly thought their physician believed was effective and was rated significantly higher than all other strategies, $p < .001$, with the exception of Medication ($M = 6.0$, $SEM = .06$). Psychotherapy ($M = 5.8$, $SEM = .06$) was rated the third highest with regard to Subjective Norms – Physician followed significantly by Symptom Monitoring ($M = 5.6$, $SEM = .06$), Psychoeducation ($M = 5.4$, $SEM = .06$), Social Support ($M = 5.2$, $SEM = .07$), Light Therapy ($M = 4.8$, $SEM = .07$), Pet Therapy ($M = 4.3$, $SEM = .08$), and Bibliotherapy ($M = 4.1$, $SEM = .08$) each of which was rated significantly different from the other strategies. The interaction between Subjective Norms - Physician and gender, $F(6.5, 3276.4) = .93$, $p = .48$, was not significant. Subjective norms of physicians differed significantly based on the specific behaviour associated with the patient-initiated strategy.

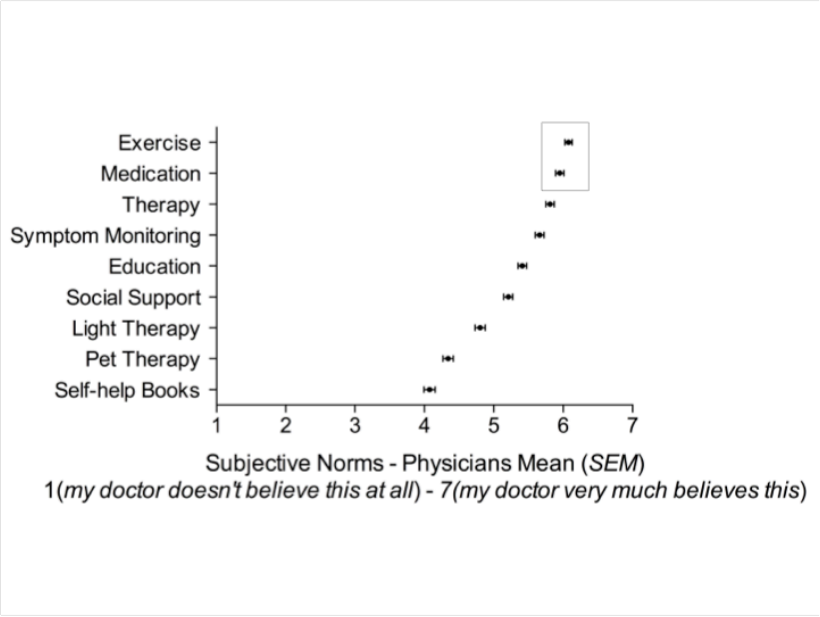

Figure 7. Average Subjective Norms - Physician rating for each of the nine patient initiated-strategies for depression and low mood. Anchors on the 7-point scale represent degree of response to the question "To what degree do you think that your doctor believes that (patient-initiated strategy for depression and low mood) could be an effective strategy for improving sad or depressed moods?" Error bars represent the standard error of the mean (*SEM*). Data points determined to be not statistically different from one another are enclosed in a box. $n = 346$

Perceived Behavioural Control. Ratings of Perceived Behavioural Control varied significantly across the nine patient-initiated strategies for depression and low mood examined, $F(6.7, 3360.6) = 58.8$, $p < .001$, $\eta_p^2 = .11$ (Figure 8). Participants rated Exercise ($M = 5.8$, $SEM = .06$) as the strategy they felt most capable of engaging in and rated Perceived Behavioural Control for this strategy significantly higher than for all other strategies, $p < .05$. Social Support ($M = 5.4$, $SEM = .07$) and Education ($M = 5.3$, $SEM = .07$) were rated similarly with regard to Perceived Behavioural Control and were rated significantly higher than all other strategies, $p < .001$. Pet Therapy ($M = 4.9$, $SEM = .09$), Psychotherapy ($M = 4.8$, $SEM = .08$), Light Therapy ($M = 4.8$, $SEM = .08$), and Symptom Monitoring ($M = 4.8$, $SEM = .08$) were all rated similarly in this respect. Medication ($M = 4.2$, $SEM = .1$) was rated significantly lower than all other strategies, $p < .001$, and Bibliotherapy ($M = 4.0$, $SEM = .1$) was rated significantly lower than Medication, $p < .05$. There was a significant interaction between Perceived Behavioural Control and gender, $F(6.7, 3354.6) = 2.1$, $p < .05$. Post-hoc analyses revealed that women rated Perceived Behavioural Control for Pet Therapy ($M = 5.1$, $SEM = .1$) higher than men ($M = 4.4$, $SEM = .2$), $t(501) = 3.2$, $p < .01$. Women were also found to have rated Perceived Behavioural Control for Psychotherapy ($M = 4.9$, $SEM = .09$) significantly higher than men ($M = 4.5$, $SEM = .17$), $t(501) = 2.11$, $p < .05$. The variability observed in the other antecedent TPB variables was also observed in the case of perceived behavioural control. Ratings of this variable differed significantly based on the specific behaviour in question.

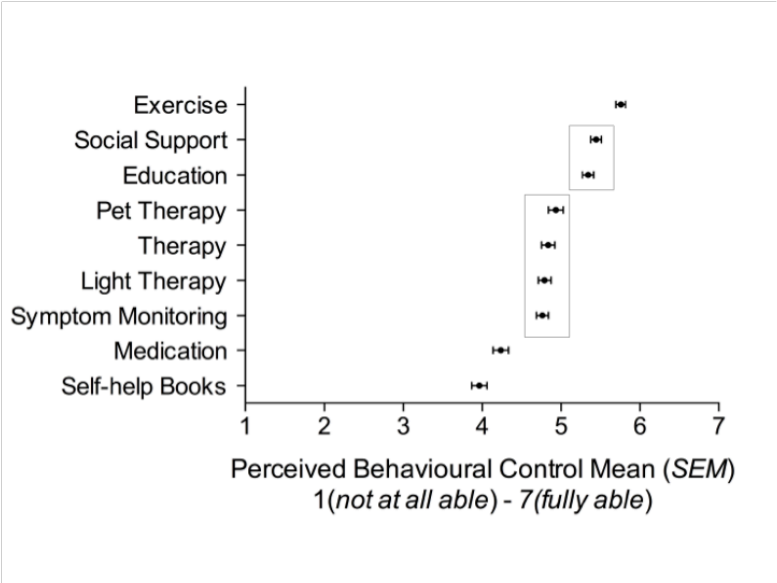

Figure 8. Average Perceived Behavioural Control rating for each of the nine patient initiated-strategies for depression and low mood. Anchors on the 7-point scale represent degree of response to the question "To what degree do you feel you would be able to (action related to patient-initiated strategy for depression and low mood)?" Error bars represent the standard error of the mean (*SEM*). Data points determined to be not statistically different from one another are enclosed in a box. $n = 346$

Intentions. Participants' rating of their intention to engage in patient-initiated strategies for depression and low mood varied significantly across strategies, $F(7.0, 3519.1) = 171.4$, $p < .001$, $\eta_p^2 = .26$ (Figure 9). Participants rated their intentions to engage in Exercise ($M = 5.8$, $SEM = .07$) significantly greater than all other strategies, $p < .05$, followed significantly by Social Support ($M = 5.6$, $SEM = .07$) and Education ($M = 4.6$, $SEM = .09$), which were significantly different from each other, $p < .001$. Pet Therapy ($M = 4.0$, $SEM = .1$), Light Therapy ($M = 4.0$, $SEM = .1$), and Symptom Monitoring ($M = 3.9$, $SEM = .09$) were all rated similarly with regard to intentions and significantly lower than Education. Psychotherapy ($M = 3.6$, $SEM = .1$) was rated significantly lower on intentions than Symptom Monitoring. Finally, the similarly rated Medication ($M = 2.8$, $SEM = .1$) and Bibliotherapy ($M = 2.7$, $SEM = .09$) strategies were rated significantly lower than all other strategies, $p < .001$. No interaction between ratings of intentions

and gender was observed, $F(7.01, 3514.5) = .91$, $p = .50$. As with the antecedent TPB variables, ratings of intentions differed significantly based on the specific behaviour under consideration.

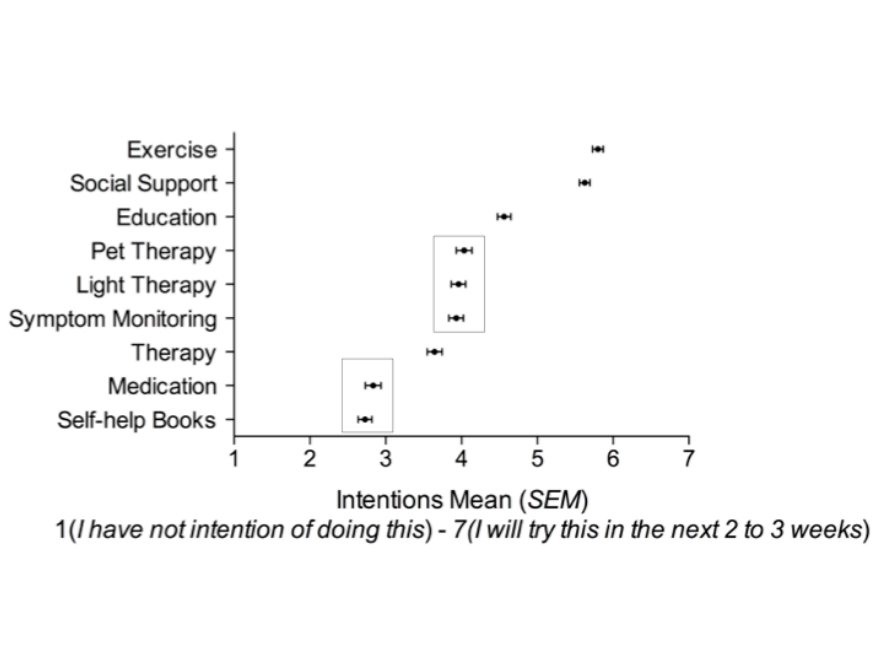

Figure 9. Average Intentions rating for each of the nine patient initiated-strategies for depression and low mood. Anchors on the 7-point scale represent degree of response to questions asking participants to indicate their intentions to engage in behaviour related to a patient-initiated strategy for depression and low mood over the next two to three weeks. Error bars represent the standard error of the mean (*SEM*). Data points determined to be not statistically different from one another are enclosed in a box. $n = 346$

Actual behaviour. Actual behaviour related to the nine patient-initiated strategies for depression and low mood was recorded for 356 participants. Figure 10 provides a visual representation of the frequency of participants, undifferentiated by control or intervention group status, attempting each of the different patient-initiated strategies over a two- to three-week period. The most popular strategy was Exercise with nearly three quarters (71.6%) of participants in the follow-up phase engaging in this behaviour at least once. Two hundred and twenty participants (61.8%) engaged in Social Support as a patient-initiated strategy for

depression. Pet Therapy (21.9%) was the third most frequently engaged in strategy. The least popular strategies were Medication (9.8%), Psychotherapy (7.6%), and Bibliotherapy (6.2%). Thirty-three participants (9.3%) indicated that they did not attempt any of the nine patient-initiated strategies for depression. On average, participants in the follow-up phases reported attempting two (M = 2.2, SD = 1.4) different patient-initiated strategies over the two- to three-week period. Figure 11 provides a visual representation of the frequency of participants, undifferentiated by control or intervention group status, engaging in one or multiple strategies.

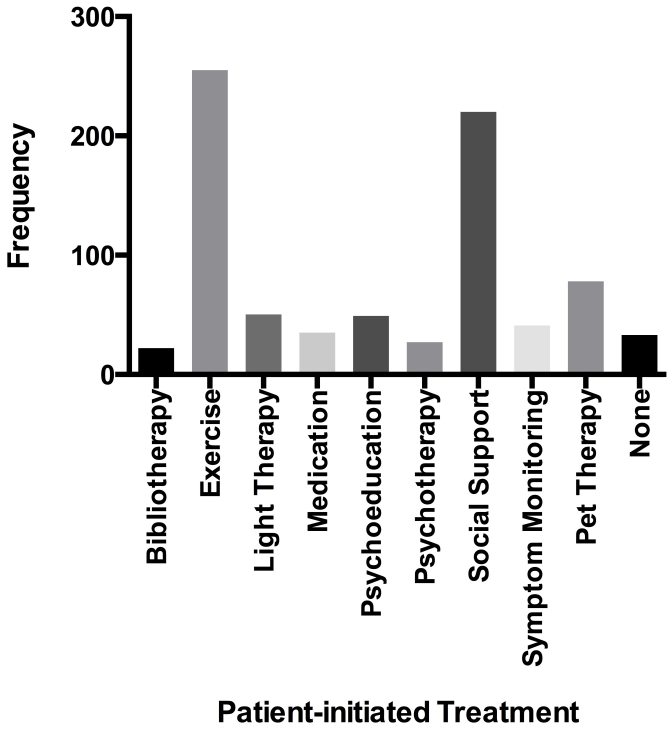

Figure 10. Frequency of participants attempting the nine different patient-initiated strategies for depression and low mood over a two- to three-week period undifferentiated by control or intervention group status. n = 356

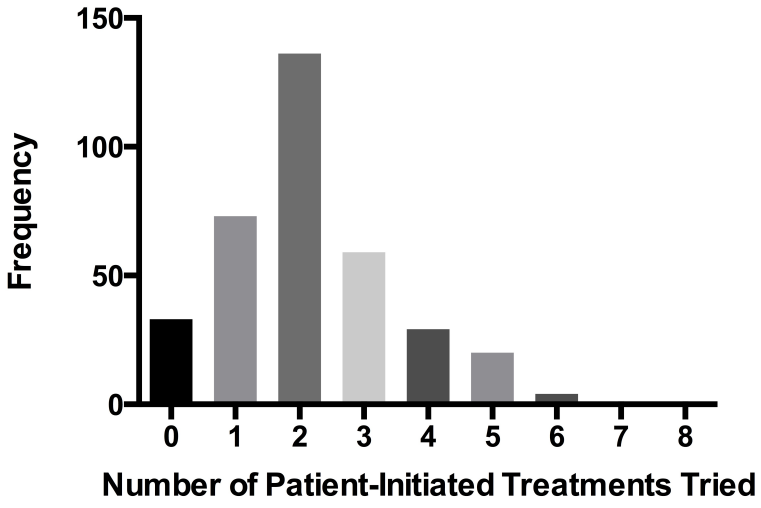

Figure 11. Frequency of participants attempting no, one, or multiple patient-initiated strategies for depression and low mood over a two to three week period undifferentiated by control or intervention group status. *n* = 356

In summary, analyses suggest that ratings of TPB antecedent variables and intentions are not uniform across the different patient-initiated strategies for depression and low mood. For example, attitudes towards Exercise as a patient-initiated strategy were significantly more favourable than they were towards bibliotherapy or medication adherence. Exercise was also believed by participants to be more favourably viewed by physicians than all other patient-initiated strategies with the exception of medication adherence. Results also indicate that ratings of attitudes, subjective norms – significant others, subjective norms – physician, perceived behavioural control, and intentions differ relative to one another depending on the patient-initiated strategy investigated. The heterogeneity of ratings for TPB constructs across patient-initiated strategies and relative to each other between strategies did not support the use of omnibus or full-model analyses as originally planned due to the potential of effects being masked and the conditions (i.e., statistical assumptions) required for such analyses.

Hypothesis Testing

Hypothesis 1

Hypothesis 1 was related to objective one of this study (i.e., examining TPB in the context of patient-initiated strategies for depression and low mood) and stated that ratings of all TPB antecedent variables will uniquely and positively predict ratings of intentions to engage in patient-initiated strategies for depression and low mood, at a composite level as well as for each individual strategy.

Correlation analyses. Correlation analyses were used first to determine the relationship of all TPB variables to each other. Pearson's r correlation analyses on overall composite scores for the four TPB antecedent variables and Intentions revealed significant, $p < .001$, positive inter-correlations among the four predictor variables and correlations between the four predictor variables and intentions (see Table 2). Significant, positive correlations were observed between antecedent variables (i.e., attitudes, subjective norms – significant others, subjective norms – physician, perceived behavioural control) and Intentions in all case at the level of each individual patient-initiated strategy (see Table 2). Correlations between composite scores of antecedent variables were generally of moderate strength, $r = .487$ to $r = .655$, with the exception of the relationship between Subjective Norms – Significant Others and Perceived Behavioural Control, $r = .388$, $p < .001$, and the relationship between Subjective Norms – Physician and Perceived Behavioural Control, $r = .322$, $p < .001$, both of which demonstrated weaker, although still significant, positive associations. The same pattern was observed in the results of correlation analyses at the level of individual patient-initiated strategies.

Table 2

Pearson's r correlations between Intentions and each of the Theory of Planned Behaviour antecedent variables (i.e., Attitudes, Subjective Norms – Significant Others, Subjective Norms – Physicians, and Perceived Behavioural Control). Results of correlation analyses between overall composite scores (means) are presented as are the range of results observed for individual patient-initiated treamtent scores.

	SN-SO		SN-P		PBC		Intentions	
	Overall	Range	Overall	Range	Overall	Range	Overall	Range
Attitudes	.655**	.356** - .606**	.516**	.277** - 431**	.487**	.405** - .661**	.444**	.317** - .544**
SN-SO	-	-	.575**	.357** - .461**	.388**	.131* - .442**	.387**	.161* - .409**
SN-P	-	-	-	-	.322**	.212** - .318**	.340**	.107 - .343**
PBC	-	-	-	-	-	-	.549**	.526** - .678**

Note. SN-SO = Subjective Norms – Significant Others
SN-P = Subjective Norms – Physician
PBC – Perceived Behavioural Control
**$p < .001$, *$p < .05$, $n = 303$

The relationship between composite scores of TPB antecedent variables and the composite score of Intentions was strongest between Perceived Behavioural Control and Intentions, r = .549, p < .001, a moderate correlation. Analyses at the level of each individual patient-initiated strategy revealed that the strongest relationship between antecedent variables and intentions was that between Perceived Behavioural Control and Intentions, which ranged from r = .526 to r = .678, p < .001. Composite and individual strategy scores of Attitudes were found to have a moderate correlation with respective scores on Intentions. The relationship between Attitudes and Intentions was consistently second strongest to the relationship between Perceived Behavioural Control and Intentions. With the exception of the relationship between Subjective Norms – Physician and Intentions in the case of Medication, r = .107, p = .063, the composite scores and individual strategy scores of Subjective Norms – Significant Others and Subjective Norms – Physician were shown to have a significant yet more modest positive association with respective scores on Intentions.

Linear regression analyses. In order to determine the amount of variance in intentions explained by the TPB antecedent variables, linear regression analyses were used. These analyses were also meant to identify the ability of individual variables to predict intentions. Linear regression analyses between the composite scores of the four TPB antecedent variables, as predictor variables, and the composite score of the criterion variable Intentions revealed that composite scores of Attitude, Subjective Norms – Significant Others, Subjective Norm – Physician, and Perceived Behavioural Control explained 35.4% of the variance in the composite score of intentions to engage in patient-initiated strategies for depression and low mood, $F_{change}(4, 298) = 40.8$, p < .001. Analyses of scores for individual strategies revealed the amount of variance in scores of Intentions explained by scores of the respective antecedent variables

ranged from 50.7% in the case of Social Support, $F_{change}(4, 298) = 76.6$, $p < .001$, to 29.5% in the case of Psychotherapy, $F_{change}(4, 298) = 31.1$, $p < .001$ (Table 3).

Table 3

Linear regression analyses predicting Intentions based on Attitudes, Subjective Norms – Significant Others, Subjective Norms – Physician, and Perceived Behavioural Control.

		Attitudes		SN-SO		SN-Physicians		PBC	
Strategy	Δr^2	*Beta*	$R_{Attitudes}^2$	*Beta*	$r_{SN\text{-}SO}^2$	*Beta*	$r_{SN\text{-}P}^2$	*Beta*	r_{PBC}^2
Composite	.354**	.142*	.0098*	.082	.0033	.085	.0045	.420**	.132**
Books	.365**	.205**	.027**	.067	.0030	.144*	.0166*	.379**	.109**
Exercise	.471**	.181**	.020**	.030	.0006	.133*	.0125*	.518**	.207**
Light Therapy	.370**	.263**	.044**	.125*	.010*	-.069	.003	.397**	.124**
Medication	.398**	.232**	.027**	.030	.0006	-.084	.0056	.457**	.116**
Education	.296**	.089	.0058	.043	.0014	.064	.0031	.461**	.173**
Therapy	.295**	.134*	.0121	-.015	.0002	.015	.0002	.468**	.171**
Social Support	.507**	.247**	.040**	.017	.0002	.025	.0004	.549**	.235**
Symptom Monitoring	.410**	.218**	.029**	-.015	.0002	.050	.0019	.490**	.176**
Pets	.486**	.124*	.0069*	.064	.0024	.066	.0034	.548**	.167**

Note. $r_{attitudes}$ = Part correlation attitudes, $r_{SN\text{-}SO}$ = Part correlation subjective norms – significant others, $r_{SN\text{-}P}$ = Part correlation subjective norms – physician, and r_{PBC} = Part correlation perceived behavioural control.
**$p < .01$, *$p < .05$, $n = 303$

Part correlation analyses, used to determine the amount of variance uniquely explained by each individual variable, suggest that the composite score of Perceived Behavioural Control is the most significant predictor of the composite score of Intentions, uniquely explaining 13.2%, $r_{PBC} = .364$, $p < .001$, of the variance in that variable. The composite score of Attitudes also uniquely predicted the composite score of Intentions, $r_{Attitude} = .099$, $p < .05$, but did so to a limited degree explaining less than 1% of the variance in Intentions. Composite scores of Subjective Norms – Significant Others and Subjective Norms – Physician did not significantly predict the composite score of Intentions on their own. The strength of the composite Perceived Behavioural Control score to predict the composite score of Intentions was also observed at the individual patient-initiated strategy level. The amount of variance in Intentions scores that was uniquely explained by scores of Perceived Behavioural Control ranged from 10.9%, in the case of Bibliotherapy, $r_{PBC} = .331$, $p < .001$, to as much as 23.5% with Social Support, $r_{PBC} = .485$, $p < .001$. Although scores on Attitudes were also found to uniquely predict scores of Intentions in the case of most individual strategies, the amount of variance in scores of Intentions explained by the score of Attitudes was never more than 4.4%, which was observed in the case of Light Therapy, $r_{Attitude} = .210$, $p < .001$. Scores of Subjective Norms- Physician were rarely identified as unique predictors of scores of Intentions in analyses at the level of the individual patient-initiated strategies and when identified as such explained less than 2% of the variance in scores of Intentions. Scores of Subjective Norms – Significant Others was identified as a significant predictor of Intentions only in the case of Light Therapy, however, the amount of variance explained was little more than 1%, $r_{SNSO} = .102$, $p < .05$. The results of the correlation and linear regression analyses above were replicated using post-intervention TPB question data.

The results of theses analyses partially support the first hypothesis that all TPB antecedent variables will significantly and uniquely predict intentions to engage in these behaviours. The results suggest that while ratings of TPB antecedent variables together explain a significant amount of variance in ratings of intentions, only Attitudes and Perceived Behavioural Control significantly and uniquely predict intentions on their own on a consistent basis.

Hypothesis 2

The second hypothesis was that ratings of intentions will significantly predict actual engagement in each of the individual patient-initiated strategies for depression.

Logistic regression analyses. Logistic regression analyses were intended to examine the ability of intentions to predict actual engagement, a binary variable (i.e., engaged in behaviour, did not engage in behaviour), in each individual patient-initiated strategy. Results of the logistic regression analyses at the level of each individual patient-initiated strategy revealed that scores of Intentions significantly predicted Actual Engagement in all cases (see Table 4). Of the nine patient-initiated strategies where scores of Intentions were found to significantly predict Actual Engagement, only two produced a meaningful change in the percentage of Actual Engagement predicted correctly from Block 0 of the analyses. Scores of Intentions to engage in Exercise, *OR* = 1.497 (95% *CI* = 1.286 – 1.742), and Medication Adherence, *OR* = 2.467 (95% *CI* = 1.881 – 3.235), were both found to meaningfully predict Actual Engagement in behaviour related to these patient-initiated strategies.

Table 4
Logistic regression analyses for Intentions to engage in patient-initiated strategies for depression and low mood predicting Actual Engagement in behaviours related to these strategies two to three weeks later.

	Odds Ratio	95% CI	Wald	*df*	*p*	Δ% Predicted Correct
Books	1.573	1.252 – 1.975	15.174	1	< .001	0
Exercise	1.497	1.286 – 1.742	27.184	1	< .001	2.3
Light	1.777	1.442 – 2.188	29.200	1	< .001	0
Medication	2.467	1.881 – 3.235	42.629	1	< .001	2.2
Education	1.900	1.495 – 2.415	27.535	1	< .001	0
Therapy	1.593	1.276 – 1.988	16.967	1	< .001	0
Social Support	1.240	1.095 – 1.404	11.434	1	.001	0
Symptom Monitoring	1.512	1.257 – 1.820	19.168	1	<.001	0
Pet Therapy	1.642	1.426 – 1.890	47.561	1	<.001	0

Note. CI = Confidence Interval, $n = 356$

The results of these analyses partially support the hypothesis that ratings of intentions would significantly predict actual engagement for patient-initiated strategies for depression and low mood. While intentions significantly predicted actual engagement for all behaviours, meaningful changes were noted in the case of only two behaviours.

Hypothesis 3

The third hypothesis of the study related to objective one was that level of depressive symptoms as measured by the PHQ-9 will significantly change ratings of attitudes, subjective norms – significant others, subjective norms – physicians, and perceived behavioural control at the composite and individual strategy levels.

Correlation analyses. Correlation analyses were used to determine the strength and nature of the relationship between depressive symptoms scores and the TPB antecedent variables. Pearson's r correlation analyses between composite scores of each of TPB antecedent variables and scores on the PHQ-9 depressive symptom measure revealed no significant associations (see Table 5). At the individual strategy level, two significant correlations were observed. A weak, negative correlation was revealed between scores on the depressive symptoms measure and scores of Perceived Behavioural Control for Social Support, $r = -.160$, $p < .01$. Also in the case of Social Support, a weak, positive association was found between Subjective Norms = Physician and scores on the depressive symptoms measure, $r = .124$, $p < .05$. No other associations between TPB variables scores and scores on the depressive symptoms measure were observed.

Table 5
Pearson's r correlations between level of depressive symptoms as measured by the PHQ-9 and the Theory of Planned Behavior antecedent variables (i.e., Attitudes, Subjective Norms – Significant Others, Subjective Norms – Physicians, and Perceived Behavioural Control). Results of correlation analyses between overall composite scores are presented as are the results of analyses with individual patient-initiated strategy scores.

	Attitudes	SN-SO	SN-Physician	PBC
Composite	-.064	-.066	-.004	-.110
Books	-.101	-.075	-.044	-.053
Exercise	-.019	-.080	.100	-.041
Light	.018	.024	-.023	-.039
Medication	.087	-.011	-.033	.038
Education	-.024	-.050	.029	-.036
Therapy	-.009	-.013	.111	-.070
Social Support	-.056	.002	.124*	-.160**
Symptom Monitoring	-.018	-.020	-.048	-.085
Pet Therapy	-.078	-.073	-.045	-.027

Note. SN = Subjective Norms, PBC = Perceived Behavioural Control, *$p < .05$, **$p < .01$
$n = 303$

Mixed model ANOVA analyses. For interaction analyses, scores of depressive symptoms were categorized into four levels (i.e., minimal, mild, moderate, moderately severe to severe). These categories were chosen for interaction analyses due to the qualitative differences between participants reporting with the different level of depressive symptoms as well as the more balanced distribution, as compared to the PHQ-9 five categories, of participants across these four categories.

These mixed model ANOVA analyses were conducted in order to determine depressive symptom group (i.e., minimal, mild, moderate, moderately severe to severe) differences on TPB antecedent variables. The mixed model ANOVA analysis of composite scores for the four TPB antecedent variables revealed no significant interaction with level of depressive symptoms, $F(7.872, 1309.33) = .705$, $p = .685$. Similar analyses at the level of individual strategies revealed significant interactions between scores for the four TPB predictor variables and level of depressive symptoms in one case and approached significance in another. Firstly, ratings of the four Theory or Planned Behaviour antecedent variables interacted significantly with level of depressive symptoms in the case of Social Support, $F(8.430, 1402.15) = 3.091$, $p < .01$, $\eta_p^2 = .018$ (Figure 12). Simple main effects for level of depressive symptoms were observed both in Subjective Norms – Physician and Perceived Behavioural Control for this patient-initiated strategy. Participants with a mild level of depressive symptoms rated Subjective Norms – Physician ($M = 5.11$, $SD = 1.51$) for Social Support significantly lower than participants with a moderately severe to severe level of depressive symptoms ($M = 5.54$, $SD = 1.50$), $t(236) = -2.0$, $p < .05$. With regard to Perceived Behavioural Control, participants with a moderately severe to severe range of depressive symptoms rated their ability to engage in Social Support significantly lower ($M = 4.96$, $SD = 1.75$) than participants in the minimal range of depressive symptoms ($M = 5.65$, $SD = 1.35$), $t(102.38) = -2.9$, $p < .01$, and participants in the mild range of depressive symptoms ($M = 5.54$, $SD = 1.48$), $t(236) = -2.6$, $p < .05$. No other significant differences in the scores of TPB antecedent variables between participants of different levels of depressive symptoms were observed in the case of Social Support.

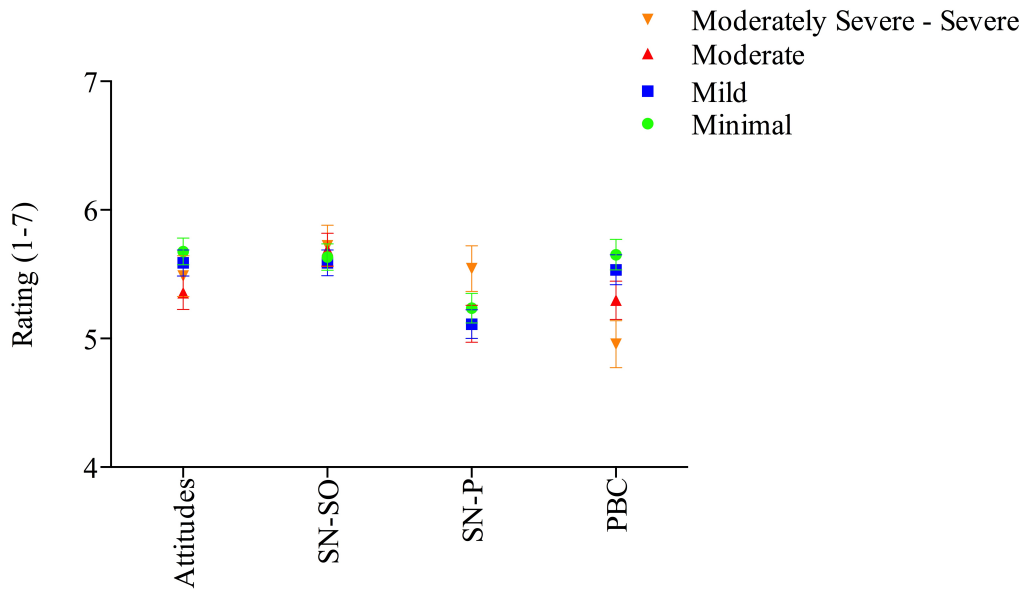

Figure 12. Comparison of mean Theory of Planned Behavior antecedent variable scores across the four levels of depressive symptoms, as measured by the PHQ-9 (i.e., minimal = 0-4, mild = 5-9), moderate = 10-14, and moderately severe to severe range =15-27), for Social Support patient-initiated strategy for depression and low mood. Error bars represent the standard error of the mean (*SEM*). *n = 503*

An interaction approaching significance was observed scores of the four TPB antecedent variables for Exercise and level of depressive symptoms, $F(7.93, 1318.56) = 1.94$, $p = .051$ (Figure 13). While no formal post-hoc comparisons were made to determine the significance of simple main effects, the graphical representation of this data suggests that participants with a minimal level of depressive symptoms rated their Perceived Behavioural Control regarding Exercise as a patient-initiated strategy for depression and low mood as higher ($M = 6.02$, $SEM = .109$) than participants in the mild range ($M = 5.72$, $SEM = .106$), participants in the moderate range ($M = 5.54$, $SEM = .136$), and participants in the moderately severe to severe range of depressive symptoms ($M = 5.56$, $SEM = .168$). No other simple main effects appeared to trend towards significance in the case of Exercise.

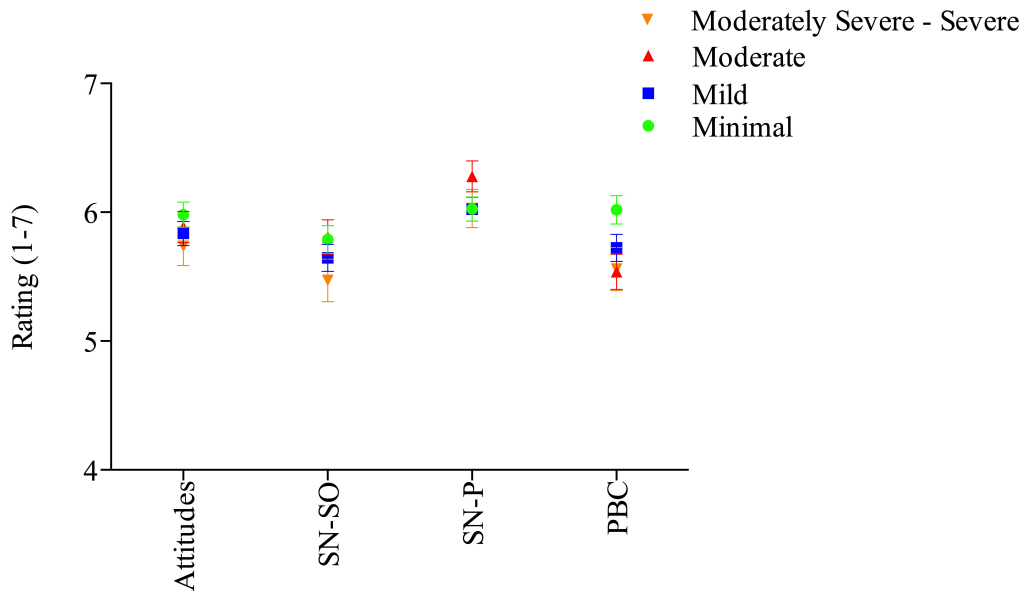

Figure 13. Comparison of mean Theory of Planned Behavior antecedent variable scores across the four levels of depressive symptoms, as measured by the PHQ-9 (i.e., minimal = 0-4, mild = 5-9), moderate = 10-14, and moderately severe to severe range =15-27), for the Exercise patient-initiated strategy for depression and low mood. Error bars represent the standard error of the mean (*SEM*). *n = 503*

These results do not support the third hypothesis and suggest that level of depressive symptoms does not have a significant impact on the composite scores of antecedent variables or the ratings of antecedent variables associated with the majority of individual patient-initiated strategies for depression and low mood.

Hypothesis 4

The fourth hypothesis of the study, which was related to objective one, was that participants with different levels of depressive symptoms as measured by the PHQ-9 will have significantly different ratings of intentions.

Correlation analyses. Correlation analyses were used to determine the strength and nature of the relationship between depressive symptoms scores and ratings of intentions. Pearson's r correlation analyses between scores on the PHQ-9 depressive symptoms measure and

a composite score of Intentions revealed no significant association between the two variables, r = .021, p = .715. Similar analyses between level of depressive symptoms and Intentions for individual patient-initiated strategies revealed one significant association. A significant, weak negative relationship was observed between depressive symptom scores and ratings of Intentions for Social Support, r = -.157, p < .01. No other significant associations between the depressive symptoms measure scores and Intentions scores was observed.

ANOVAs. ANOVA analyses were conducted in order to determine depressive symptom group (i.e., minimal, mild, moderate, moderately severe to severe) differences on ratings of intentions. A between subjects ANOVA comparing a composite score of Intentions across the four levels of depressive symptoms did not reveal a significant interaction, $F(3, 299) = 0.94$, p = .424. A mixed model ANOVA of ratings of intentions across all nine strategies with level of depressive symptoms as a between-subjects variable revealed did not reveal a significant interaction between ratings of intentions and level of depressive symptoms, $F(20.69, 2062.13)$ = 1.114, p = .326.

The results of these analyses do not support the hypothesis that level of depressive symptoms changes the ratings of intentions at the composite level or at the level of individual patient-initiated strategies for depression and low mood.

Hypothesis 5

The fifth hypothesis of the study related to objective one was that level of depressive symptoms will impact whether or not an individual engages in patient-initiated strategies for depression and low mood.

Pearson chi-square analyses. Chi-square analyses were conducted in order to determine if depressive symptom group (i.e., minimal, mild, moderate, moderately severe to severe)

resulted in different frequencies of engagement and no engagement in patient-initiated strategies than would have otherwise been expected. Crosstabs Pearson Chi-square analyses with Actual Engagement (yes, no) and level of depressive symptoms (i.e., minimal, mild, moderate, and moderately severe to severe) for each individual patient-initiated strategy revealed significant differences in three cases and approached significance in one case. Participants with a moderate level of depressive symptoms engaged in Medication Adherence significantly more than participants in the minimal range of depressive symptoms, $\chi^2(3) = 19.32$, $p < .001$. Participants with a moderately severe to severe range level of depressive symptoms were significantly more likely than all other participants to engage in Education as a patient initiated strategy for depression and low mood, $\chi^2(3) = 21.96$, $p < .001$. In the case of Psychotherapy, participants in the moderate range and the moderately severe to severe range were significantly more likely to seek psychotherapy services than other participants, $\chi^2(3) = 33.65$, $p < .001$. A trend towards significance was observed in the case of Light Therapy. Participants with minimal depressive symptoms were less likely to engage in light therapy than participants with greater levels of depressive symptoms, $\chi^2(3) = 7.06$, $p = .07$.

These analyses partially support the hypothesis that level of depressive symptoms impacts whether or not an individual engages in patient-initiated strategies for depression and low mood. Participants with more severe levels of depressive symptoms were more likely to engage in Medication Adherence, Psychoeducation, and Psychotherapy than participants with less severe levels of depressive symptoms.

Hypothesis 6

Hypothesis 6, the final hypothesis related specifically to objective one, was that ratings of intentions to engage in patient-initiated strategies for depression and low mood will be more predictive of actual behaviour in groups identified with greater levels of depressive symptoms

Moderation analyses. These analyses were used to determine whether or not level of depressive symptoms moderated the relationship between intentions and actual engagement. Moderator analyses using PROCESS by Dr. Hayes, a syntax developed for moderator analyses in SPSS, revealed no significant moderation of scores on the depressive symptoms measure on the ability of scores of Intentions to predict Actual Engagement in the any of the patient-initiated strategies for depression and low mood (Table 6).

Table 6
Results of moderator analyses using PROCESS syntax developed by Hayes (2013). Interaction coefficient represents the added value of the score on the depressive symptoms measure as a moderator in the relationship between Intentions and Actual Engagement in behaviours related to nine different patient-initiated strategies for depression and low mood.

	Interaction Coefficient	Standard Error	*p*	Lower Limit 95% CI	Upper Limit 95% CI
Bibliotherapy	.0289	.0307	.3472	-.0313	.0890
Exercise	.0146	.0226	.5175	-.0297	.0590
Light Therapy	-.0163	.0265	.5385	-.0681	.0356
Medication	.0136	.0285	.6322	-.0422	.0695
Education	.0288	.0343	.4000	-.0383	.0960
Psychotherapy	-.0473	.0315	.1340	-.1090	.0145
Social Support	.0017	.0188	.9268	-.0352	.0387
Symptom Monitoring	.0313	.0246	.2034	-.0169	.0795
Pets	.0075	.0167	.6525	-.0252	.0403

* $p < .05$, $n = 213$

The results of these analyses do not support the hypothesis that the association between intentions and actual engagement is moderated by level of depressive symptoms such that the association between the two variables would be stronger for participants with more severe levels of depressive symptoms.

Summary of Results for Objective 1 Hypotheses

The results of analyses for the hypotheses related to objective one of this study, the investigation of TPB in the context of patient-initiated strategies for depression and low mood, suggest that TPB functions well in the context of these behaviours with antecedent variables generally predicting intentions and intentions, albeit to a limited degree, predicting actual engagement. These results also suggest that level of depressive symptoms does not change the way TPB functions in the context of these patient-initiated strategy behaviours except in isolated cases.

Hypothesis 7

Hypothesis 7 is the first hypothesis associated with objective two of the current study. Objective two was to investigate the impact of a Knowledge Translation and Knowledge Transfer-based educational intervention on TPB variables. Hypothesis 7 stated that this educational intervention will improve composite scores of TPB antecedent variables as well as similar scores related to individual patient-initiated strategies when compared with a neutral sham intervention. In the case of pet therapy where the educational intervention aimed to demonstrate the strategy's lack of effectiveness in managing depressive symptoms, it is hypothesized that the educational intervention will result in lower ratings of TPB antecedent variables scores when compared with a neutral sham intervention.

Composite score mixed model ANOVA analyses. Composite score ANOVA analyses were intended to determine the effect of the educational intervention from baseline to post intervention on TPB antecedent variables. Mixed model ANOVA analyses with composite scores, excluding scores for pet therapy due to the intended negative effect of the educational intervention, revealed significant interactions between time (baseline and post-intervention) and group (control and intervention) for Attitudes, $F(1, 495) = 16.1$, $p < .001$, $\eta_p^2 = .031$, Subjective Norm – Significant Others, $F(1, 495) = 5.9$, $p < .05$, $\eta_p^2 = .012$, and Subjective Norm – Physician, $F(1, 495) = 12.4$, $p < .001$, $\eta_p^2 = .024$. See figures 14 through 16 for visual representations of these interactions. Post-hoc analyses revealed no significant difference between control and intervention group composite score means at baseline for Attitudes, $t(501) = .507$, $p = .613$, Subjective Norms – Significant Others, $t(501) = .783$, $p = .434$, and Subjective Norms – Physician, $t(501) = 1.03$, $p = .306$. At post-intervention, intervention group composite score means were significantly greater than control group means in the case of Attitudes, $t(501) = 2.30$, $p < .05$, $d = .21$ and Subjective Norms – Physician, $t(501) = 2.20$, $p < .05$, $d = .197$. The significant interaction observed in the case of Subjective Norms – Significant Others did not result in a significant difference between control and intervention group means at post-intervention. A significant interaction between time and group was not observed in the case of composite scores for Perceived Behavioural Control, $F(1, 495) = .27$, $p = .61$, $\eta_p^2 = .001$.

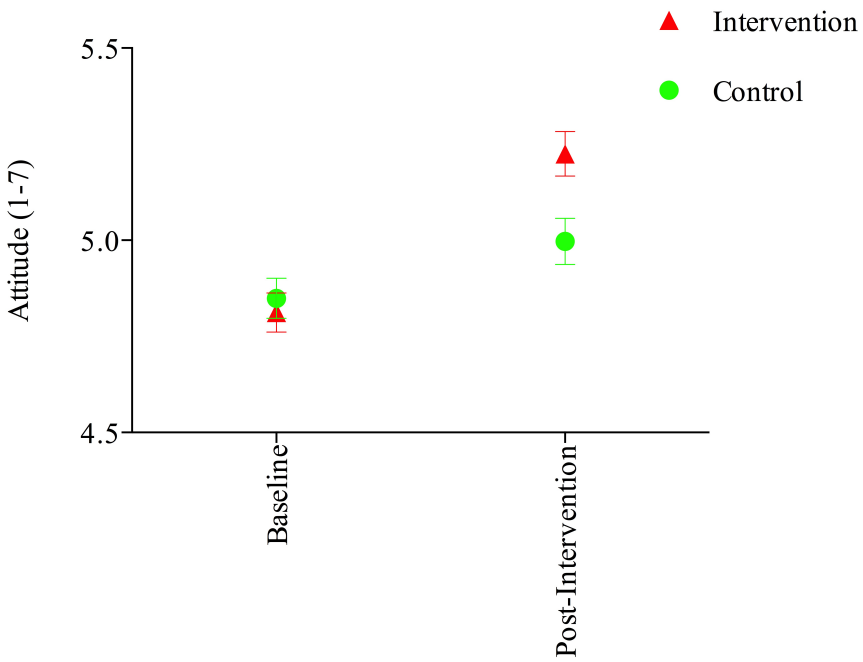

Figure 14. Interaction between time (baseline and post-intervention) and group (control and intervention) for a composite score of Attitudes. *n* = 503

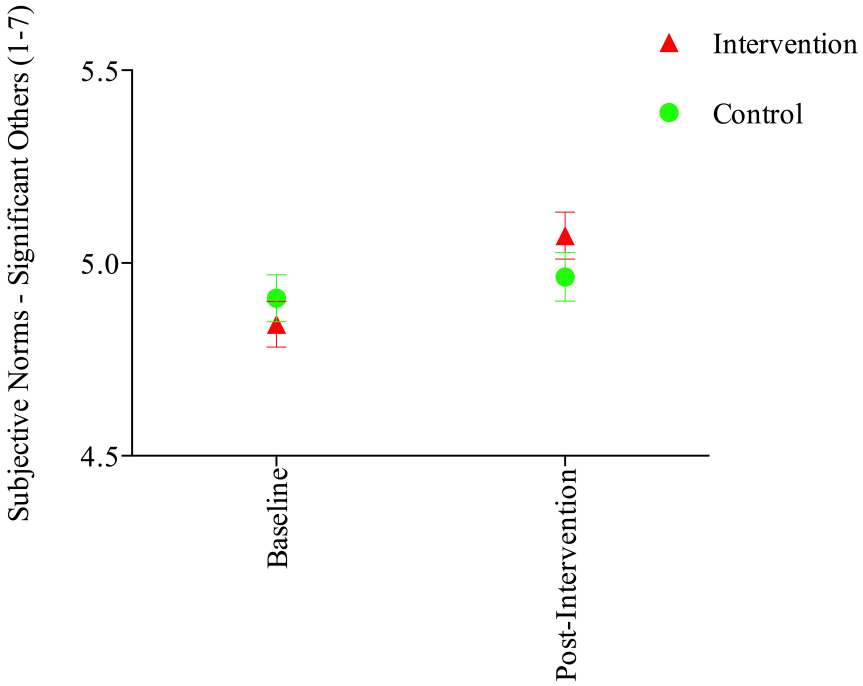

Figure 15. Interaction between time (baseline and post-intervention) and group (control and intervention) for a composite score of Subjective Norms – Significant Others. *n* = 503

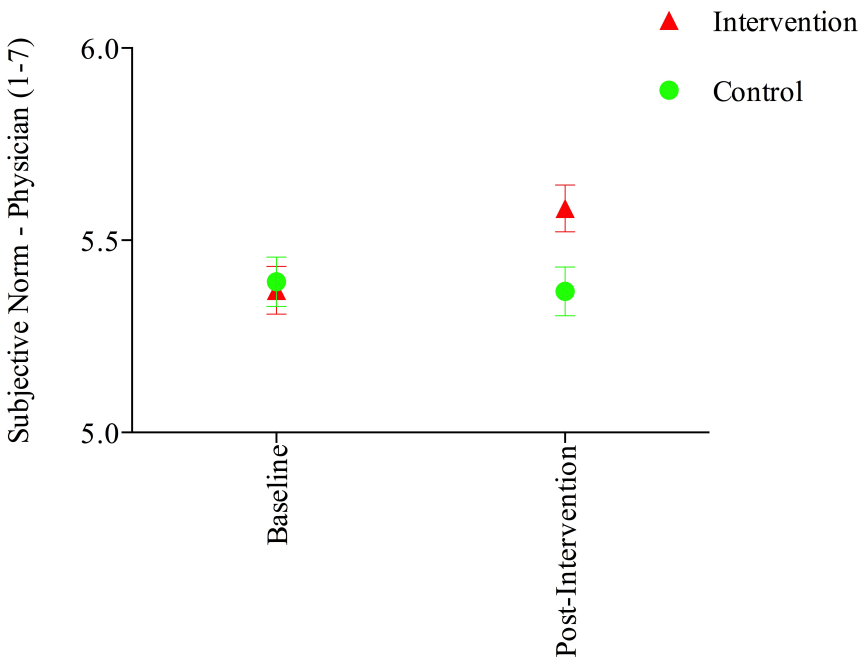

Figure 16. Interaction between time (baseline and post-intervention) and group (control and intervention) for a composite score of Subjective Norms – Physician. n = 503

Individual strategy scores mixed model ANOVA analyses. ***Attitudes.*** Individual strategy ANOVA analyses were intended to determine the effect of the educational intervention from baseline to post intervention on TPB antecedent variables. In the case of Attitudes, significant interactions between time (baseline and post-intervention) and group (control and intervention) at the individual patient-initiated strategy level were observed for Light Therapy, $F(1, 496) = 8.34$, $p < .01$, $\eta_p^2 = .017$, Education, $F(1, 495) = 15.45$, $p < .001$, $\eta_p^2 = .030$, and Symptom Monitoring $F(1, 495) = 4.46$, $p < .05$, $\eta_p^2 = .009$. See figures 17 through 19 for visual representations of these interactions. Control and intervention groups were found to have similar means for Attitudes at baseline for Light Therapy, $t(501) = .773$, $p = .440$, Education, $t(501) = .932$, $p = .352$, and Symptom Monitoring, $t(501) = .420$, $p = .675$. Following the intervention phase of part 1, participants in the intervention group rated Attitudes significantly higher than participants in the control group for Education, $t(501) = 3.23$, $p < .01$, $d = .29$. This pattern was

not observed to the same degree in the case of Light Therapy, $t(501) = 1.66$, $p = .098$ or Symptom Monitoring, $t(501) = 1.55$, $p = .123$.

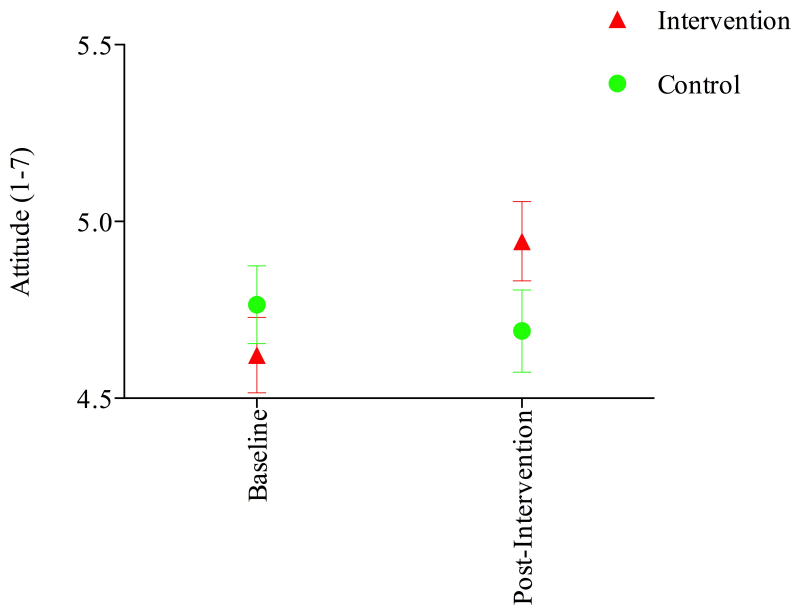

Figure 17. Interaction between time (baseline and post-intervention) and group (control and intervention) for Attitude toward Light Therapy. $n = 503$

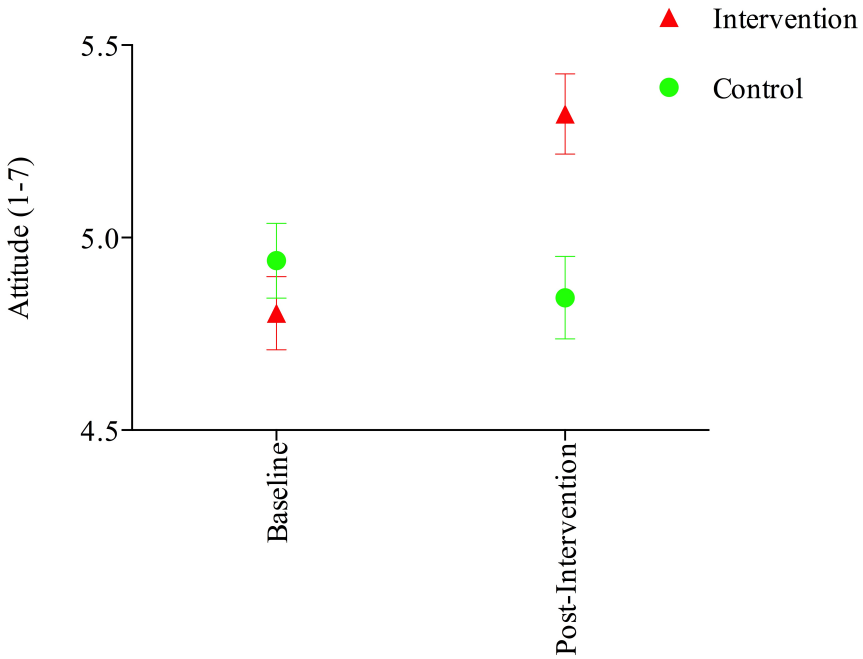

Figure 18. Interaction between time (baseline and post-intervention) and group (control and intervention) for Attitude toward Education. $n = 503$

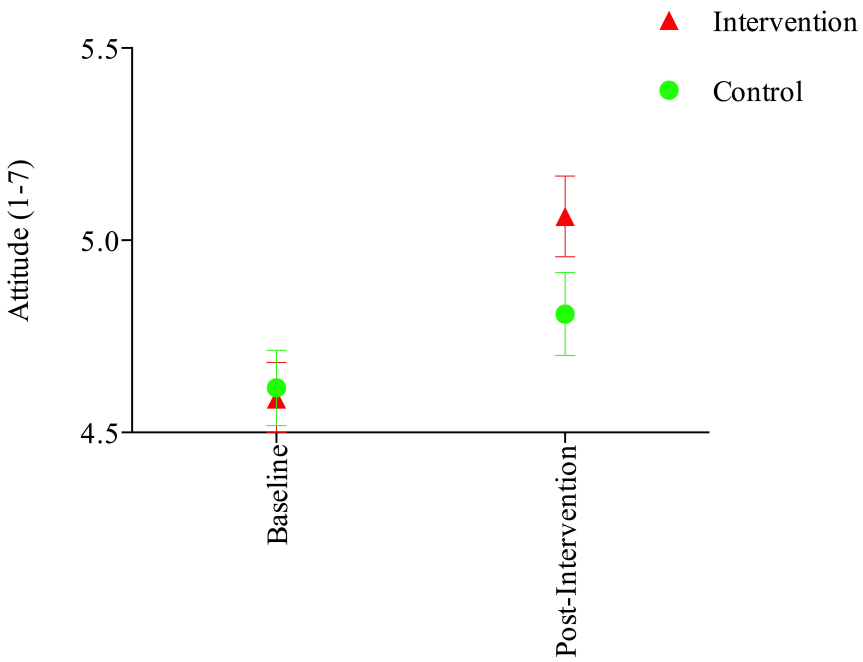

Figure 19. Interaction between time (baseline and post-intervention) and group (control and intervention) for Attitude toward Symptom Monitoring.

Subjective Norm – Significant Others. A significant interaction between time and group for Subjective Norm – Significant Others scores was observed only in the case of Education, $F(1, 495) = 10.88$, $p < .01$, $\eta_p^2 = .021$. See figure 20 for a visual representation of the interaction. At baseline, control and intervention groups did not significantly differ from one another on their score of Subjective Norm – Significant Others for this strategy, $t(501) = 1.50$, $p = .134$. At post-intervention, the intervention group rated Subjective Norm – Significant Others significantly higher than participants in the control group, $t(501) = 2.31$, $p < .05$, $d = .20$.

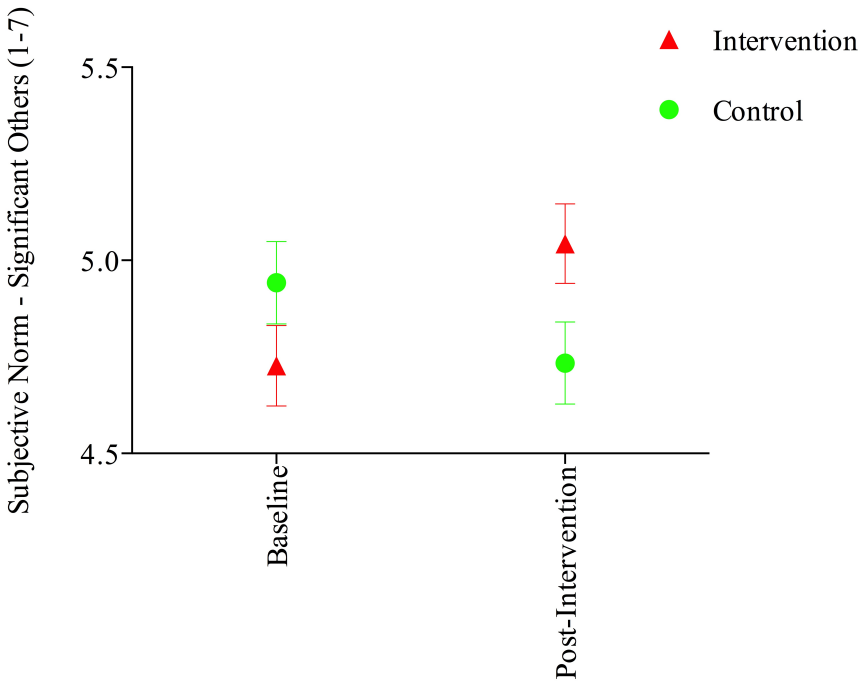

Figure 20. Interaction between time (baseline and post-intervention) and group (control and intervention) for Subjective Norm – Significant Other in the case of Education. n = 503

Subjective Norm – Physician. For Subjective Norm – Physician scores, significant interactions between time and group were observed in three cases. These interactions were observed in the case of Medication, $F(1, 495) = 8.44$, $p < .01$, $\eta_p^2 = .017$, Education, $F(1, 495) = 14.11$, $p < .001$, $\eta_p^2 = .028$, and Symptom Monitoring, $F(1, 495) = 5.81$, $p < .05$, $\eta_p^2 = .012$. See figures 21 through 23 for visual representations of these interactions. In the case of all three strategies, baseline ratings of Subjective Norm – Physician did not significantly different between intervention and control group participants: Medication, $t(501) = 1.86$, $p = .063$, Education, $t(501) = 1.304$, $p = .193$, and Symptom Monitoring, $t(501) = 1.52$, $p = .129$. Only in the case of Education were post-intervention ratings of Subjective Norm – Physician significantly higher for intervention group participants when compared with that of control group participants, $t(501) = 3.18$, $p < .01$, $d = .28$. Significant interactions observed with Medication

and Symptom Monitoring did not result in significant differences between control and intervention group means at post-intervention.

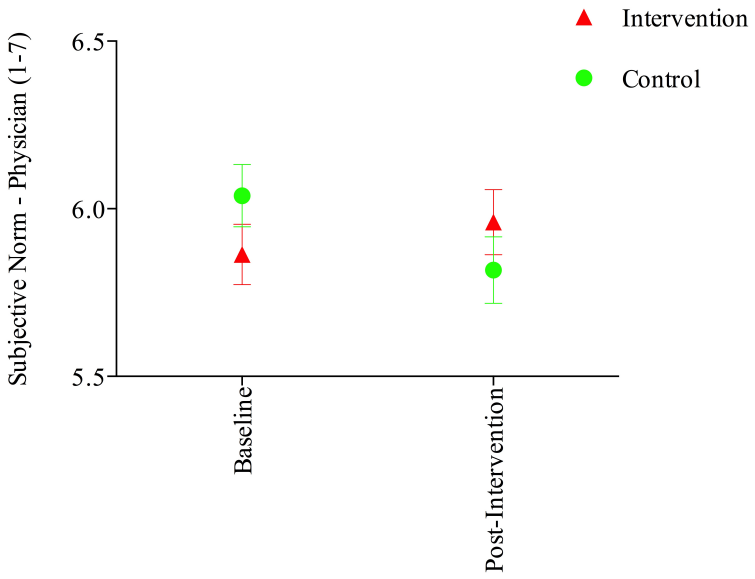

Figure 21. Interaction between time (baseline and post-intervention) and group (control and intervention) for Subjective Norm – Physician in the case of Medication. n = 503

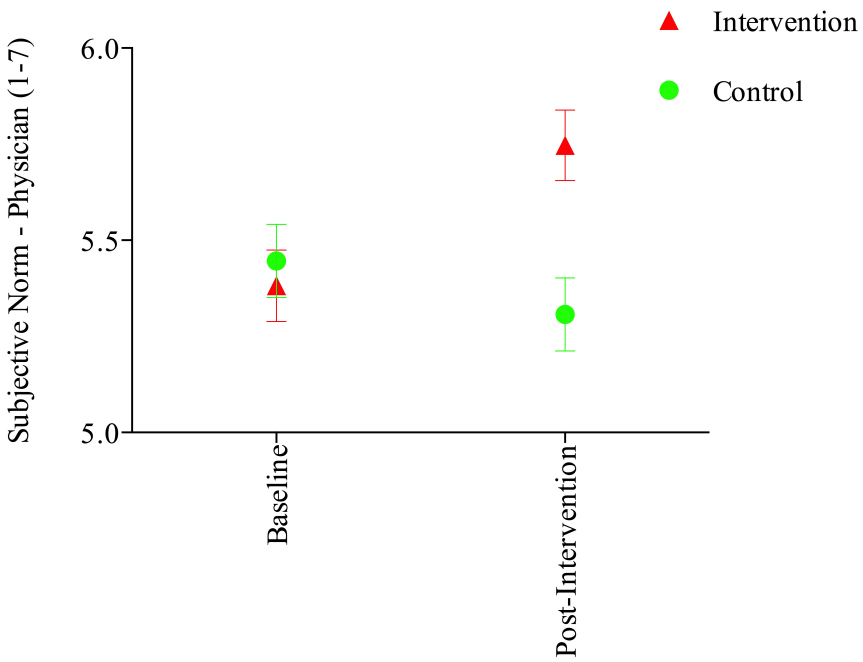

Figure 22. Interaction between time (baseline and post-intervention) and group (control and intervention) for Subjective Norm – Physician in the case of Education. *n* = 503

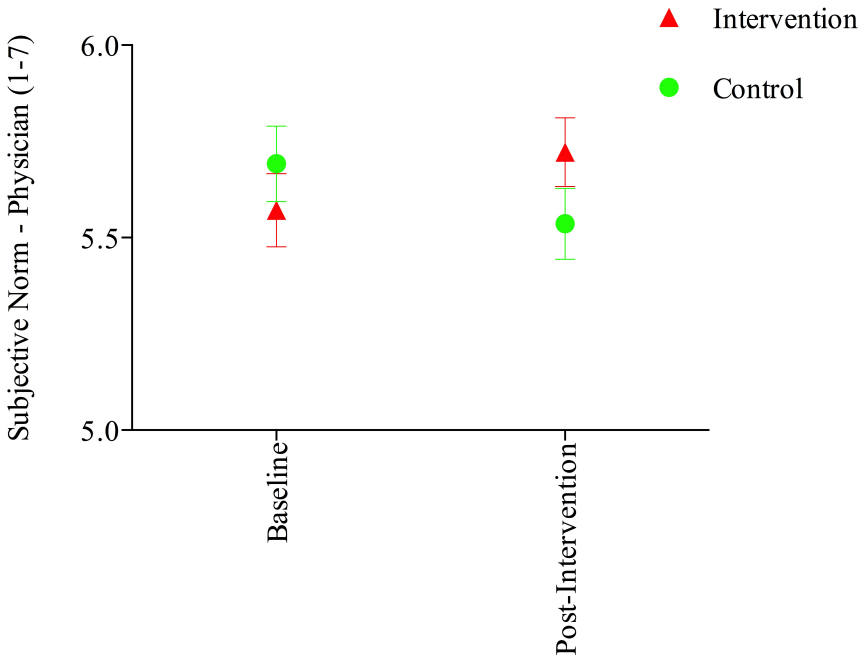

Figure 23. Interaction between time (baseline and post-intervention) and group (control and intervention) for Subjective Norm – Physician in the case of Symptom Monitoring. *n* = 503

Pet Therapy mixed model ANOVA analyses. In the case of Pet Therapy where the educational intervention was intended to have a negative effect (i.e., lower Attitudes, Subjective Norms – Significant Others, Subjective Norms – Physicians, Perceived Behavioural Control), significant interactions between time and group were observed for ratings of Attitude, $F(1, 495) = 17.51$, $p < .001$, $\eta_p^2 = .033$, Subjective Norm – Significant Others, $F(1, 495) = 9.26$, $p < .01$, $\eta_p^2 = .018$, and Subjective Norm – Physician, $F(1, 495) = 22.18$, $p < .001$, $\eta_p^2 = .043$. See figures 24 through 26 for visual representations of these interactions. At baseline, control and intervention group means for each of these TPB variables did not differ significantly from each other: Attitude, $t(501) = -1.31$, $p = .192$, Subjective Norm – Significant Other, $t(501) = -1.21$, $p = .226$, and Subjective Norm – Physician, $t(501) = .619$, $p = .536$. At post-intervention, ratings of Subjective Norm – Physician, $t(501) = -4.60$, $p < .001$, $d = .41$, were significantly lower amongst the intervention group participants when compared with the control group participants. A similar pattern was not observed to the same degree in the case of ratings for Attitude, $t(501) = -1.69$, $p = .93$. Ratings of Subjective Norm – Significant Others at post-intervention were not found to differ significantly from one another despite the significant interaction observed.

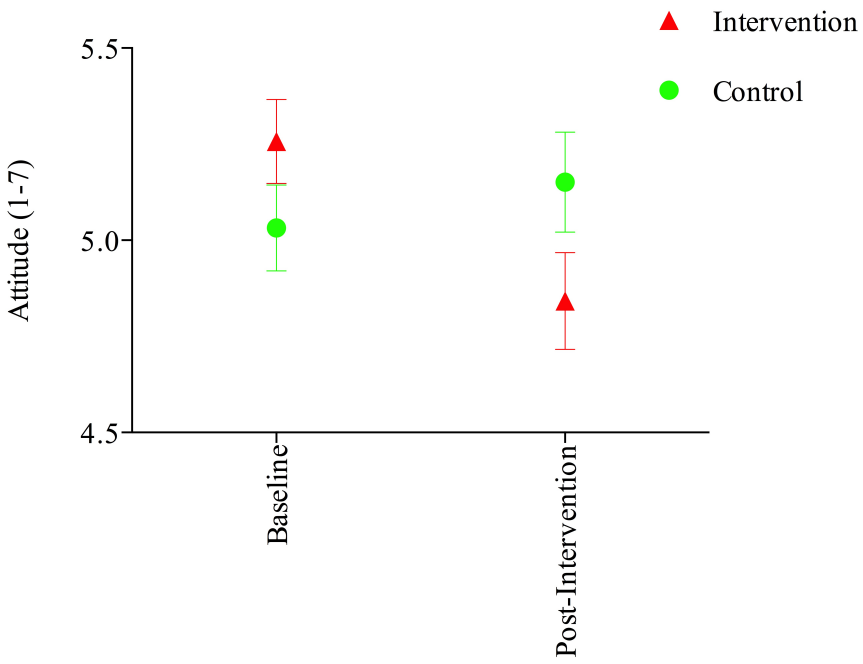

Figure 24. Interaction between time (baseline and post-intervention) and group (control and intervention) for Attitude toward Pet Therapy. *n* = 503

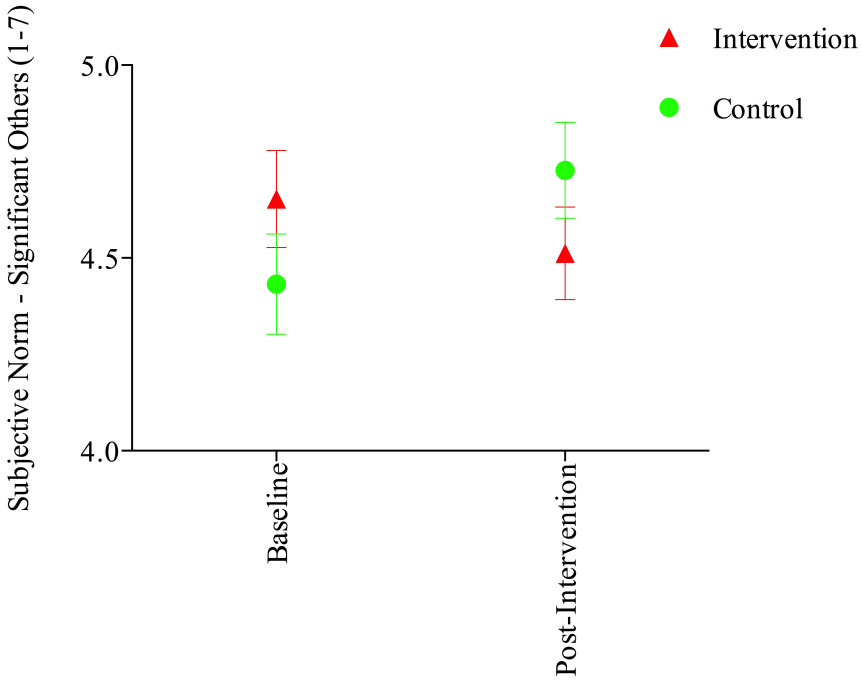

Figure 25. Interaction between time (baseline and post-intervention) and group (control and intervention) for Subjective Norm – Significant Others in the case of Pet Therapy. *n* = 503

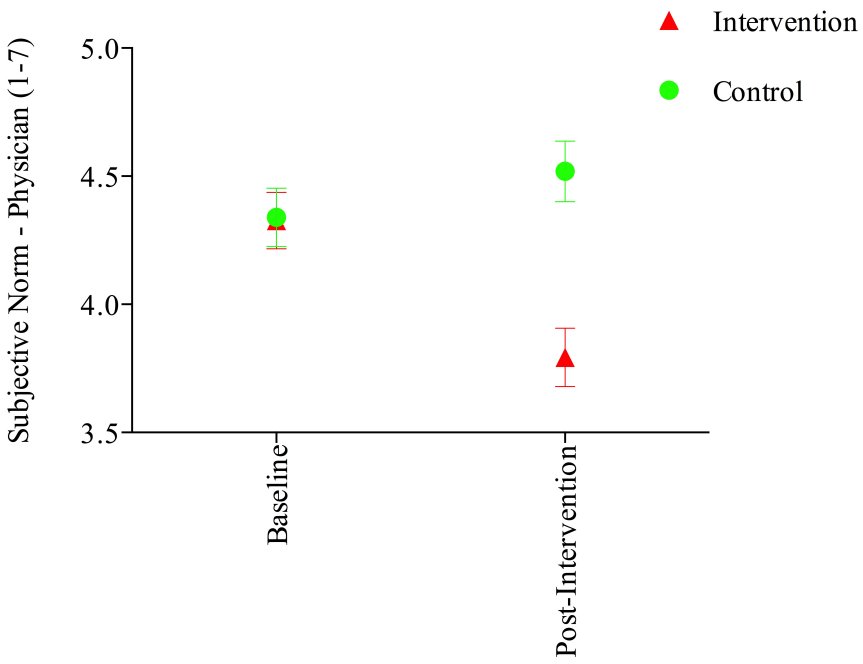

Figure 26. Interaction between time (baseline and post-intervention) and group (control and intervention) for Subjective Norm – Physician in the case of Pet Therapy. *n* = 503

The analyses associated with hypothesis 7 partially supported the hypothesis that the educational intervention would have a positive, or negative, impact on TPB antecedent variables. At the composite level, Attitudes and Subjective Norms – Physicians were positively and significantly influenced by the educational intervention. At the level of individual strategies, antecedent variable ratings for the Education patient-initiated strategy were impacted most significantly by the educational intervention. Other positive effects were also observed in isolated cases. Ratings for antecedent variables for Pet Therapy were also significantly impacted in the expected direction.

Hypothesis 8

The eighth hypothesis of the this study, related to objective two, stated that the educational intervention used will improve composite scores for intentions to engage in patient-initiated strategies as well as similar scores related to individual patient-initiated strategies when

compared with a neutral sham intervention. In the case of pet therapy, the educational intervention will result in lower ratings of intentions to engage in the patient-initiated strategy.

Mixed model ANOVA analyses. These ANOVA analyses were intended to determine the effect of the educational intervention from baseline to post intervention on intentions. Mixed model ANOVA analyses at the composite level did not reveal a significant interaction between time (baseline and post-intervention) and group (control and intervention) for scores of Intentions to engage in patient-initiated strategies for depression and low mood, $F(1, 495) = 2.54$, $p = .112$, $\eta_p^2 = .005$. Significant interactions between time and group were observed at the individual strategy level for Bibliotherapy, $F(1, 495) = 6.56$, $p < .05$, $\eta_p^2 = .013$, and Education, $F(1, 495) = 6.78$, $p < .01$, $\eta_p^2 = .014$. See figures 27 and 28 for visual representations of these interactions. In the case of Bibliotherapy, the significant interaction was the result of differences between intervention and control groups observed at baseline; therefore, this interaction is not useful in the context of this study. In the case of Education, no differences were observed between intervention and control group means at baseline, $t(501) = 1.47$, $p = .141$ or at the post-intervention phase, $t(501) = .869$, $p = .385$.

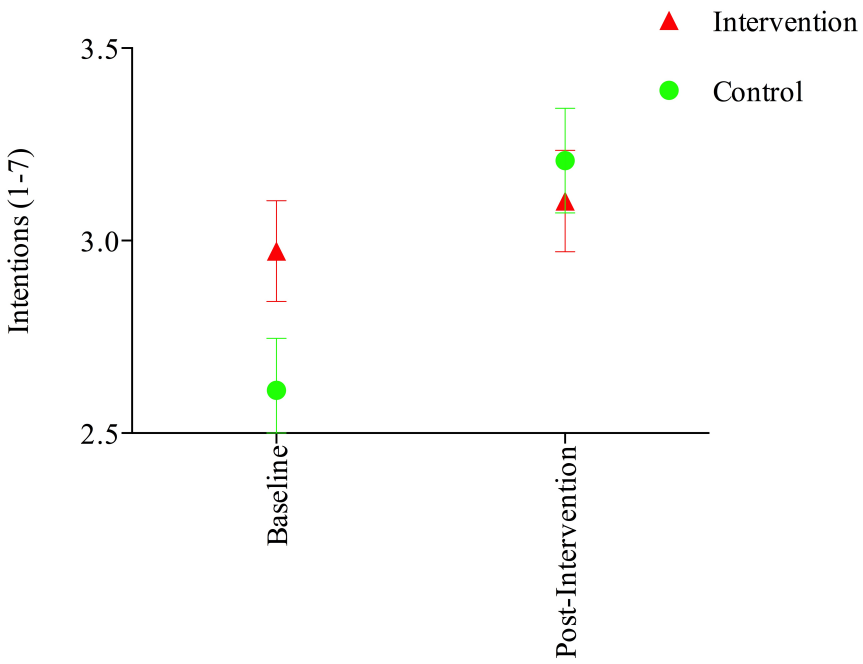

Figure 27. Interaction between time (baseline and post-intervention) and group (control and intervention) for Intentions in the case of Bibliotherapy. *n* = 503

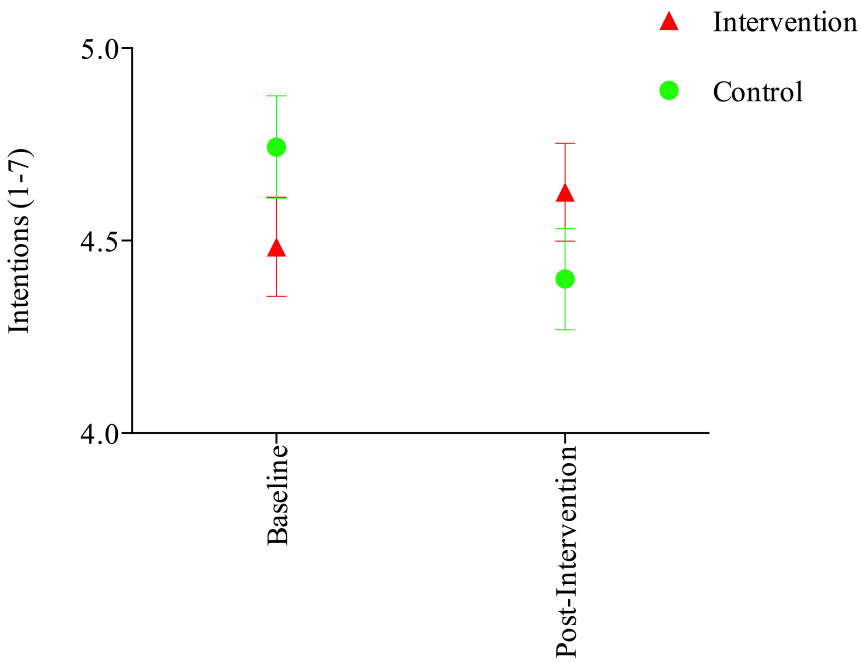

Figure 28. Interaction between time (baseline and post-intervention) and group (control and intervention) for Intentions in the case of Education. *n* = 503

The results of these analyses do not support the hypothesis that the educational intervention would significantly increase ratings of intentions at the composite level and the level of each of the individual patient-initiated strategies for depression and low mood.

Hypothesis 9

Hypothesis 9 was that participants who are exposed to the educational interventions for patient-initiated strategies for depression and low mood will engage more in those strategies than participants who were exposed to a neutral sham intervention. In the case of pet therapy, participants who were exposed to the educational intervention will engage less in that strategy than those participants who were exposed to the sham intervention

Chi square analyses. Chi-square analyses were conducted to determine whether the frequencies of actual engagement in those who were exposed to the educational intervention and those who were not were significantly different than would have been expected had there been no intervention. Chi square analyses revealed that frequencies of Actual Engagement and no Actual Engagement in the intervention group were not significantly different from frequencies of Actual Engagement and no Actual Engagement in the control group for all of the nine patient-initiated strategies for depression and low mood, $p > .05$. When differentiated by level of depressive symptoms (i.e., minimal, mild, moderate, moderately severe to severe), one significant Chi square result was observed and one trend towards significance was observed. The significant Chi square result was observed in the case of Psychotherapy at the moderate level of depressive symptoms and suggested that participants in the intervention group with a moderate level of depressive symptoms were significantly more likely than participants in the control group with a moderate level of depressive symptoms to engage in behaviour related to seeking Psychotherapy services, $\chi^2(1) = 5.14$, $p < .05$. The trend towards significance was observed in

the case of Exercise for participants with a moderately severe to severe level of depressive symptoms. In this case, participants in the intervention group with a moderately severe to severe level of depressive symptoms were more likely, although not significantly so, than participants in the control group with a moderately severe to severe level of depressive symptoms to engage in behaviour related to Exercise as a patient-initiated strategy for depression and low mood, $\chi^2(1) = 2.54$, $p = .11$.

The analyses related to hypothesis 9 partially supported the hypothesis that the educational intervention would improve frequency of actual engagement in patient-initiated strategies. When differentiated by level of depressive symptoms, participants with a more severe level of depressive symptoms who had also been exposed to the educational intervention were somewhat more likely than participants with a similar level of depressive symptoms who were in the control group to engage in psychotherapy.

Summary of Results for Objective 2 Hypotheses

The analyses for hypothesis 7, 8, and 9 were related to objective two of this study, which investigated the impact of a Knowledge Translation and Knowledge Transfer-based educational intervention on the variables within TPB and actual engagement of the patient-initiated strategy behaviours themselves. The educational intervention was observed to have a significant albeit minimal impact on TPB antecedent variables. Intentions were not impacted by the intervention, however, frequency of actual engagement appears to have been improved in isolated cases. The negative educational intervention had a significant impact on many of the antecedent variables for Pet Therapy.

Discussion

Depression is a major health concern. In order to help alleviate the burden of the condition on the primary health care system, efforts must be made to encourage the use of patient-initiated strategies for depression and low mood for self-management. The current study had two main objectives. The first objective was to better understand the TPB model of behaviour change in the context patient-initiated strategies for depression and low mood. In so doing, the current study was intended to provide insight into the most relevant variables and mechanisms of behaviour change in this context. Secondly, the current study aimed to investigate the impact of a Knowledge Translation and Knowledge Transfer-based educational intervention on TPB variables and, ultimately, actual engagement in patient-initiated strategies for depression and low mood.

Summary of Main Findings

Theory of Planned Behavior in the Context of Patient-Initiated Strategies.

Results of the current study support the use of TPB in the context of patient-initiated strategies for depression and low mood. TPB antecedent variables, Attitudes, Subjective Norms – Significant Others, Subjective Norms – Physicians, and Perceived Behavioural Control, were found to collectively explain 35.4% of the variance in Intentions to engage in patient-initiated strategies for depression and low mood in general and between 29.5% and 50.7% at the individual strategy levels. Furthermore, findings of the current study indicated that Intentions to engage in patient-initiated strategies for depression and low mood significantly predicted, although to a limited degree, actual engagement in these behaviours. These findings are similar to those found in other studies using TPB in the context of health behaviours (e.g., French, Darker, Eves, & Sniehotta, 2013; Gronoj, Bech-Larsen, Chan, & Tsang, 2012; Pineles &

Parentse, 2012) and the amount of variance in Intentions to engage in these patient-initiated strategies explained by TPB antecedent variables is comparable to that of other studies examining intentions to engage in health behaviours (e.g., Boudreau & Godin, 2009; Cooke & French, 2008; Hyland, McLaughlin, Boduszek, & Prentice, 2012).

Perceived Behavioural Control and Attitudes were found to be the greatest unique predictors of Intentions at the composite level and at the level of some individual strategies. While little to no TPB investigations exist for many of the behaviours related to the patient-initiated strategies examined in the current study (e.g., symptom tracking, bibliotherapy, light therapy) there is research investigating these behaviours used for other health conditions. In these cases, the findings of the current study are similar to those found in other studies. For example, in the case of exercise, perceived behavioural control has consistently been found to be the greatest predictor of intentions to engage in exercise behaviours (e.g., Catellier & Yang, 2013; Spink, Wilson, & Bostick, 2012). Furthermore, previous research investigating medication adherence found that attitudes was a significant predictor of intentions (e.g., Pineles & Parente, 2012). It is clear that findings from the current study correspond with past research in this field. The novel contribution of the current study's findings is both the variety of behaviours investigated as well as the context in which these behaviours are considered (i.e., self-management of depression or low mood). This research is necessary since investigating behaviour change related to exercise in the context of body image and weight loss is different than in the context of mood improvement.

Results of the current study suggest that level of depressive symptoms does not meaningfully impact the variables associated with TPB and attitudes in particular. These findings are at odds with previous research that suggests negative affect has a significant impact on

attitudes in the case of exercise (Catellier & Yang, 2013). This discrepancy may be due to difference in context (i.e., the purpose of the behaviour) and the type of affect measured (i.e., subjective experience versus objective measurement of depressive symptoms). Nevertheless, the findings of the current study, which demonstrated a functional model of TPB, suggest that level of depressive symptoms as measured by a gold standard assessment tool (i.e., PHQ-9) does not have a meaningful impact on attitudes or any other TPB variables in the context of patient-initiated strategies for depression and low mood.

Impact of Educational Intervention

Results of the current study also showed that an educational intervention based on Knowledge Translation and Knowledge Transfer principles specifically targeting the antecedent variables of TPB model and delivered using a one-time, internet-based, text medium significantly improved both Attitudes and Subjective Norms – Physicians for patient-initiated strategies for depression and low mood in general. Improvements in Attitudes, Subjective Norms – Significant Others, and Subjective Norms – Physicians also occurred in isolated cases at the level of each individual strategy. Perceived Behavioural Control and Intentions were not improved as a result of the educational intervention, neither at the composite level nor at the level of the individual strategies. In the case of Pet Therapy where the educational intervention was negative, the results suggest that this intervention was successful at reducing Attitudes and Subjective-Norms - Physician. These findings are consistent with previous research demonstrating the impact of similar educational interventions on attitudes and subjective norms (e.g., Anderson, Noar, & Rogers, 2013; Zhang, Shi, Chen, Wang, & Wang, 2009) related to other health behaviours. Unlike the findings of the current study, previous research has demonstrated the ability to improve Perceived Behavioural Control and Intentions related to health behaviours

(e.g., Milton & Mullan, 2012; Zhang et al., 2009). The lack of such an effect in the current study may be explained by the absence of multiple indicators for Perceived Behavioural Control and Intentions. The current study used only one indicator for each construct (i.e., attitudes, subjective norms, etc.) for each behaviour. Doing so limited the capacity of the study to fully tap the constructs investigated. Another reason for the lack of effect observed on Perceived Behavioural Control and intentions may have been the dosage of the intervention (i.e., a one-time, one medium exposure), which, in comparison to other interventions (e.g., Tyson, Rosenthal, & Harriet, 2014), was minimal.

General Discussion

Prior Knowledge

While everyone experiences low mood at some point in their life, it is interesting that the results of the current study suggest that only one in two people readily identify strategies they can employ themselves to manage low mood or depression. It is acknowledged that the absence of a response to the open-response question does not necessarily imply that a participant could not identify strategies for managing low mood or depression, but the similar durations spent on the open-response question page between participants who responded and those who did not suggests that the majority of those who did not respond had difficulty identifying strategies. The finding that nearly half of people may not be able to readily identify strategies to manage their mood is worrisome and provides a context for increasing rates of depression. These results also suggest that not enough is being done to educate people about ways that they can manage their low mood or depression. Of the 43 strategies identified by those who did complete the open-response question, evidence-based patient-initiated strategies for depression and low mood (e.g., exercise, social support) were mentioned frequently. Approximately half of those who responded

to the open-response question mentioned evidence-based strategies. This suggests that people may gravitate towards those behaviours that, through their own experiences, have demonstrated their effectiveness in improving mood. These findings may also suggest that campaigns to promote these behaviours in other settings (e.g., public health, primary care) and for other purposes (e.g., exercise for weight management) have successfully brought attention to these most effective strategies.

Attitudes and Beliefs towards Patient-Initiated Strategies

General attitudes and beliefs. Attitudes and beliefs have been identified as important constructs in the prediction of actual engagement in health behaviours (e.g., Carpenter, 2010). The results of the current study offer a better understanding of the attitudes and beliefs, within the framework of TPB (Ajzen, 1991), that people have towards different patient-initiated strategies for depression and low mood. Results also permit a comparison of attitudes and beliefs for different strategies. The findings suggest that people have generally positive attitudes towards all of the patient-initiated strategies investigated as part of this study with a composite score of 4.9 of a possible 7. Even in the case of Bibliotherapy, which was rated the lowest with regard to Attitudes, the average rating was moderate at 3.5 of a possible 7. The degree to which people thought their significant others (i.e., family and friends) believed these strategies were effective at improving mood was also generally positive with a similar composite score of 4.9 of a possible 7. These findings are positive in that they demonstrate that people generally acknowledge that there are behaviours that exist to improve mood and that none of the evidence-based strategies investigated are entirely dismissed by the general population. Furthermore, the Subjective Norm – Significant Other finding suggests that these behaviours are, generally speaking, socially accepted.

When compared with their own attitudes and their perceptions of their significant others attitudes, it appears that people think their physicians believe more strongly in patient-initiated strategies for depression and low mood than they do. While it is not surprising that people think their physicians believe in patient-initiated strategies, the discrepancies between how people feel about patient-initiated strategies, how they perceive their significant others feel, and their perceptions about how their physicians feel does provide a better context for interventions aimed at improving people's attitudes, beliefs, and actual engagement in patient-initiated strategies for depression.

Perceived Behavioural Control toward the patient-initiated strategies investigated in the current study was also generally positive with an average rating of 4.9 of a possible 7. Perception of ability to engage in these strategies appears to be comparable to attitudes toward the strategies as well as perceived attitudes of significant others towards the strategies. Once again, however, it appears that the degree to which people think their physicians believe in the effectiveness of these strategies is greater than people's perceived ability to engage in these strategies. Finally, it was observed that Intentions to engage in patient-initiated strategies for depression and low mood were significantly lower than all ratings of attitudes and beliefs, even after controlling for those participants who believed that these behaviours were not relevant to them due to a lack of depressive symptoms. The observed average rating of 4.2 of a possible 7 for Intentions still suggests positive intentions towards to these strategies in general, but ratings of Intentions appear lower than other attitudes and beliefs towards these behaviours.

Comparisons among strategies. Based on the results of the open-response question asking participants to identify strategies that they use to improve their mood where Exercise and Social Support were mentioned frequently, it is not surprising that Exercise and Social Support

were also rated by participants as the most effective among the strategies investigated in the current study. Part of the reason why these strategies may be viewed so highly is their social acceptability and their multi-purpose use (e.g., exercise improves physical health, body image, mental health). Social acceptance may be a particularly important variable in individuals' perceptions of the effectiveness of strategies. If true effectiveness, as determined through lived experience or education, was the principle factor in people's rating of the effectiveness of these strategies, Medication and Bibliotherapy would not have been rated significantly lower than all other strategies with regard to effectiveness and Pet Therapy would not have been rated so highly. Social acceptance appears to play a significant role in attitudes towards these strategies. It is interesting to note that both Psychoeducation and Psychotherapy were rated highly in comparison to other strategies, although this may be a function of the discipline of study from which the majority of sample was recruited (i.e., Psychology).

The most conventional patient-initiated strategies for depression and low mood (i.e., Exercise, Social Support, Psychotherapy, and Medication) were those with the highest ratings of Subjective Norms – Significant Others. It appears that people identify less conventional strategies (i.e., Light Therapy, Symptom Monitoring, and Pet Therapy) as being less accepted by their significant others than the more conventional strategies. Bibliotherapy once again was rated particularly low suggesting a general sentiment of disapproval towards this patient-initiated strategy. Of interest in these findings is that people seem to think their significant others believe Medication is more effective, relatively speaking, than they do themselves. Once again, this may be a function of most participants studying Psychology, but it may also reveal a tendency for significant others to want their loved ones to receive help and reduce their depressive symptoms at all costs whereas the individuals themselves prefer less invasive interventions.

Comparing the ratings of Subjective Norms – Physicians suggest, a perceived preference of physicians towards more medically-oriented strategies such as Exercise, Medication, Psychotherapy, and Symptom Monitoring was observed. Although Pet Therapy was rated quite highly among individuals' own perceptions of effectiveness in reducing depressive symptoms, people clearly acknowledge that physicians have a less favourable view of the effectiveness of this strategy. Interestingly, it appears that people think their physicians have a relatively low perception of the effectiveness of Social Support, Light Therapy, and Bibliotherapy. This finding may be due to the focus that physicians place on medically-oriented interventions to address mental health conditions like depression (e.g., McPherson & Armstrong, 2012). Low ratings of subjective norms – physician for Social Support, Light, Therapy, and Bibliotherapy may also be due to a lack of awareness regarding the evidence-based support for these strategies.

Less variability was observed in the ratings of Perceived Behavioural Control towards the patient-initiated strategies than in the ratings of Attitudes, Subjective Norms – Significant Others, and Subjective Norms – Physician variables. This suggests that there was greater consensus among participants regarding the relative difficulty of each of the patient-initiated strategies. While people felt they had the greatest control over engaging in Exercise, Social Support, and Psychoeducation as ways to improve their mood, their perceived control over other strategies was generally less. Furthermore, it appears that Perceived Behavioural Control was greatly influenced by individuals' Attitude toward a particular strategy. Both Medication Adherence and Bibliotherapy, objectively speaking, are among the easier patient-initiated strategies to engage in (i.e., remembering to take medication regularly or reading a book and applying its contents) yet they were ranked as the most difficult strategies to engage in. Regularly exercising would seem much more difficult to accomplish, yet it is ranked as the

easiest. These findings suggest that Attitudes and other variables (e.g., social acceptability) likely have a greater influence on ratings of Perceived Behavioural Control than the actual difficulty of engagement in the strategy.

Actual Engagement

The patient-initiated strategies for depression and low mood that individuals identified as having the highest intentions to engage in over a two- to three-week period were in fact the most frequently engaged in strategies. Exercise and Social Support were by far the two behaviours most frequently engaged in. Since participants were not asked if engagement in these behaviours was in direct response to low mood, it cannot be assumed that all of the participants who exercised or received social support in some form from friends or family did so with the intent of improving mood specifically. As mentioned previously, there are many other reasons why someone may exercise or engage in social behaviour. The same may be said for Pet Therapy, another frequently engaged in behaviour. Patient-initiated strategies that do not have multiple purposes, like Bibliotherapy, Symptom Monitoring, Medication and Light Therapy were engaged in much less frequently. On average, participants attempted to engage in two patient-initiated strategies and 10% of individuals did not attempt any of the strategies.

Theory of Planned Behavior in the Context of Patient Initiated Strategies

Antecedent variables predicting intentions. Correlation analyses revealed moderate to strong associations between all of TPB antecedent variables (i.e., Attitudes, Subjective Norms – Significant Others, Subjective Norms – Physician, Perceived Behavioural Control) and between each of the antecedent variables and Intentions. This finding suggests that the constructs themselves are meaningfully related to one another and provides support for the use of TPB in the context of the behaviours being investigated in the current study. The strongest associations

among antecedent variables themselves and between antecedent variables and intentions most often involved Perceived Behavioural Control suggesting that this variable is among the most influential of TPB variables in this context.

Results of linear regression analyses do not support the hypothesis that all of the TPB antecedent variables significantly and uniquely predict Intentions. Globally speaking, Perceived Behavioural Control was observed to be the most significant predictor of Intentions to engage in patient-initiated strategies for depression and low mood. Attitude was also identified as a unique predictor, but explained considerably less variance in Intentions than did Perceived Behavioural Control. Analyses at the individual strategy level revealed that Attitudes were occasionally a weak predictor of Intentions, but Perceived Behavioural Control was consistently the strongest predictor of Intentions. Subjective Norms – Significant Others and Subjective Norms – Physician were not identified as significant predictors of Intentions at the composite level or for individual strategies, suggesting that in isolation subjective norms are relatively unimportant.

While not all of TPB antecedent variables were shown, on their own, to be significant predictors of Intentions to engage in patient-initiated strategies for depression and low mood, all four antecedent variables together explained more than double the variance in Intentions than Perceived Behavioural Control does alone. Correlation analyses suggested that there were generally strong relationships between all of the antecedent variables and intentions. It stands to reason, therefore, that the model in its entirety provides a useful framework for understanding behaviour change in this context. Together the antecedent variables explained, on average, more than a third of the variance in Intentions. In some cases, the amount of variance explained was as high as 50%. This degree of explanation is considerable and comparable to many other contexts in which TPB is used to better understand behaviour change (e.g., Boudreau & Godin, 2009;

Cooke & French, 2008; Hyland, McLaughlin, Boduszek, & Prentice, 2012). It appears, therefore, that TPB is an appropriate model for investigating behaviour change, at least to the point of intentions to engage in behaviour, in the context of patient-initiated strategies for depression and low mood.

Intentions predicting actual engagement. The results of logistic regression analyses suggested that Intentions were a significant and meaningful predictor of actual engagement for only two patient-initiated strategies for depression and low mood investigated as part of this study. A number of explanations are possible for the weak relationship observed between intentions and actual behaviour. The duration of the period between rating Intentions and recording actual engagement (i.e., two to three weeks) and the lack of specificity of the actual behaviour to be engaged in for most strategies may have contributed to this weak relationship. It is also possible that using only one question (i.e., one indicator) for Intentions resulted in less than ideal psychometric characteristics resulting in the construct of Intentions not being fully measured. While these methodological considerations may have contributed to the weak relationship observed, it is also possible that a moderating variable exists between Intentions and actual engagement.

Unlike physical ailments (e.g., healing limbs, obesity) or conditions that have self-evident interventions (e.g., rehabilitation, dieting), the appreciation of mental health conditions like low mood or depression is highly subjective. While depressive symptoms measures may indicate a heightened level of depressive symptoms, an individual may or may not identify himself or herself as having low mood. This phenomenon was observed in the case of the current study. Participants who indicated that they had low intentions to engage in patient-initiated strategies for depression and low mood because they did not have depression or low mood, obtained scores

on the PHQ-9 depressive symptoms measure that were comparable to that of participants who did not identified this as a reason for having low intentions or those participants who rated intentions high. Although the survey of the current study did not collect information regarding participants' subjective experience of mood (i.e., as opposed to specific depressive symptoms) at the time of the study, it is fair to assume there may be some discrepancy between ratings of depressive symptoms as measured by the PHQ-9 and the subjective experience of mood (i.e., happy or sad) of the participants. This discrepancy becomes an extraneous variable in the analyses of the current study and may have a significant impact on the ability of Intentions to predict actual engagement. After all, an individual who subjectively does not identify as having low mood at the time he or she rates intentions or at any time throughout the period prior to follow-up will be less likely to engage in patient-initiated strategies for depression and low mood. This illustrates the possibility of a moderating variable related to the perceived relevance of the behaviour (e.g., subjective experience of mood).

Affect in the Theory of Planned Behavior Model

Impact of affect on Theory of Planned Behavior variables. Correlation analyses suggest that level of depressive symptoms is not associated in a meaningful way with any of TPB antecedent variables or with intentions to engage in patient-initiated strategies for depression and low mood. Results of mixed model ANOVA analyses extend on this finding and suggest that qualitative levels of depressive symptoms (i.e., minimal, mild, moderate, moderately severe to severe), as determined by the PHQ-9 cut scores, do not have a global impact on TPB antecedent variables or Intentions in this context. Although level of depressive symptoms appears to have an isolated impact on some variables in the context of individual strategies (i.e., social support), the effect is weak and therefore has little meaningful impact. In general, and in most cases at the

individual strategy level, these findings do not support the hypothesis that depressive symptoms modify the ratings of TPB antecedent variables or intentions. This finding is surprising since it was expected that mood, one aspect of which was measured by the depressive symptoms measure, would influence the antecedents of behaviour change as has been shown in previous research (Catellier & Yang, 2013). While the findings of the current study reflect an extreme aspect of affect in that it measures mood difficulties, the findings do appear to be in disagreement with Ajzen's (2011) claim that prior affect would be incorporated in the ratings of TPB antecedent variables.

Given that TPB model appears to function as well as it does in the context of patient-initiated strategies for depression and low mood, it is unlikely that the lack of influence that depression has on the model, as demonstrated in the findings of the current study, is due to psychometric inconsistencies. It is possible that the depressive symptoms measure failed to capture a complete indicator of affect. Still, post-hoc analyses using just the second item of the PHQ-9 Questionnaire (i.e., "Over the last 2 weeks, how often have you been feeling down, depressed, or hopeless?), which at face value appears to address affect in a direct manner, did not reveal any significant interactions with TPB antecedent variables. Since conventional, and scientific (e.g., Fishbein, 2008; Smith, 2013), wisdom suggests that low mood and depressive symptoms have a significant, negative impact on attitude, motivation, and ability to complete tasks, Ajzen's (2011) assumption that affect would impact the variables in his theoretical model was sound; however, since level of depressive symptoms was not found to significantly impact these variables and, therefore, is not incorporated directly into TPB model as it is currently laid out, it may be concluded that mood difficulties must be added as a separate variable in the model.

Although TPB is one of the most comprehensive behaviour change models, it never accounts for the all of the variability in intentions or in actual engagement in any behaviour. This is also the case in the context of patient-initiated strategies for depression and low mood where the model accounts for, at most, 50% of the variance in intentions and significantly less for actual engagement. This suggests that variables outside of the model account for remaining variability in intentions and actual engagement. Among the possible exterior variables, prior affect, including depressive symptoms, is likely among those that would explain the greatest variance in intentions and actual engagement. As discussed previously, since TPB model is based on beliefs, attitudes, and perceptions, a subjective measure of affect is likely to be best. While the findings of the current study may conclude that mood difficulties must be added as a separate variable within TPB model, there is little indication as to where this variable may be best situated within the model.

In the case of intentions, one would expect that people who identify themselves as having lower mood or being more depressed would rate intentions to engage in patient-initiated strategies for depression as greater since the strategies are more relevant to them. While a possible discrepancy between participants' rating of depressive symptoms on the PHQ-9 and their subjective rating of mood, as previously discussed, may have diluted this effect, it is reasonable to assume that scores on the PHQ-9 would, at the very least, have been a proxy to participants' subjective affect thus producing some effect on ratings of intentions. However, this was not observed. While it can be argued that individuals with greater levels of depressive symptoms would be expected to rate intentions for these patient-initiated strategies high, due to their increased relevance, it can also be argued that heightened depressive symptoms will result in lower ratings of intentions due to increased apathy, difficulties with concentration, and other

symptoms of depression that would make it difficult for an individual to actively engage in any behaviour. If this were the case, then the relevance of the patient-initiated strategies to some depressed individuals would increase ratings of intentions, the depressive symptoms impairing behavioural activation would decrease ratings of intentions for other depressed individuals, and the net effect would be zero. While there is no definitive way of addressing this question in the current study, qualitative data collected does suggest that very few participants identified being "too depressed" as a reason for having low intentions to engage in patient-initiated strategies for depression and low mood.

The findings point towards the addition of two new constructs within TPB in this context. The first, as previously mentioned, is level of mood difficulties. While some research suggests that general affect, and negative affect in particular, has an effect on attitudes (Catellier & Yang, 2013), results of the current study suggest that level of mood difficulties does not appear to be captured any more within the construct of Intentions than it is within the antecedent variables. Level of mood difficulties or subjective affect, therefore, may be introduced as a separate variable at some location within the overall model. The second additional variable is the perceived relevance of the behaviour being examined. As with all mental health issues, the problem itself is subjective and, therefore, "problem appreciation" is required in order for a behaviour, such as those related to patient-initiated strategies, to be relevant to the individual. Only when a behaviour is relevant to an individual can TPB be applied.

Impact of affect on actual engagement. Findings of Chi Square analyses support the hypothesis that level of depressive symptoms significantly impacts whether or not an individual actually engages in patient-initiated strategies in three of the nine patient-initiated strategies. Participants with greater levels of depressive symptoms were more likely to engage in

Medication Adherence, Educational, and Psychotherapy than participants with lower levels of depressive symptoms. This pattern was not observed, however, in the case of the other patient-initiated strategies where participants with differing levels of depressive symptoms were equally likely to engage in the strategies. Interestingly, both Medication Adherence and Psychotherapy are strategies that are likely to be prescribed by a physician. Under these circumstances, an individual given these prescriptions is arguably more likely to acknowledge they have a problem with low mood or depression. If this is true, it lends support to the suggestion that problem appreciation has a greater influence on TPB variables, including actual engagement, than an objective measure of symptoms such as the PHQ-9.

It is also interesting to note that in five of the nine patient-initiated strategies for depression and low mood investigated, participants with minimal and mild levels of depressive symptoms were equally likely to engage in these strategies as were participants who were identified as being in the moderate or moderately severe to severe range of depressive symptoms. This suggests that for the majority of patient-initiated strategies, persons with healthy mood also routinely engage in these behaviours. In some cases, engagement in these behaviours may be with the expressed purpose of maintaining healthy mood. In other cases, engagement in these strategies (e.g., exercise, socializing) may be for other purposes but with the added and unintentional benefit of maintaining mood. Whatever the case, it is important to consider that these patient-initiated strategies are relevant to everyone, medication adherence and psychotherapy seeking excluded, regardless of one's the level of depressive symptoms.

Moderating effect of affect. The results of the current study do not support the hypothesis that level of depressive symptoms moderates the relationship between Intentions and Actual Engagement for the patient-initiated strategies for depression and low mood investigated

in this study. This suggests that intentions is no better a predictor of actual engagement for these strategies in persons with high levels of depressive symptoms than it is in persons with low levels of depressive symptoms.

While Ajzen did not discuss the impact of affect on the interaction between variables, these analyses were intended to examine the effect of depressive symptoms on the interaction between intentions and actual behaviour. The findings suggest that level of depressive symptoms does not modify this relationship. This may be due to the fact that level of depressive symptoms as measured in the current study, using the PHQ-9, may only be a proxy of a person's "problem appreciation" and not represent the true perceived relevance of patient-initiated strategies to individual. Also, as discussed previously, with heightened levels of depressive symptoms, individuals are less likely to have the motivation to engage in any behaviour, including those related to patient-initiated strategies for depression and low mood. In the current study, both of these extraneous variables may be working against each other in the case of moderating relationships between Intentions and Actual Engagement, masking any effect that either has on the relationship. Introduction of these two additional variables into TPB would provide a better understanding of the model in the context of depression and these behaviours.

Knowledge Translation and Transfer Educational Interventions

Impact of educational interventions on antecedent variables. ***Positive educational intervention*****.** The results of the current study partially support the hypothesis that a positive educational intervention using Knowledge Translation and Knowledge Transfer theory principles increases ratings of TPB antecedent variables. Globally speaking, an educational intervention such as that used in the current study appears to improve Attitudes and Subjective Norms – Physicians towards patient-initiated strategies for depression and low mood. These findings

support the hypothesis. Perceived Behavioural Control and Subjective Norms – Significant Others towards these strategies did not appear to be affected by the educational intervention leaving the hypothesis only partially supported.

Individual strategy analyses suggest that the educational intervention had isolated effects on all of TPB variables with the exception of Perceived Behavioural Control. An examination of effect sizes suggests that Attitudes and Subjective norms – Physicians are the antecedent variables most impacted by the educational intervention. In the case of Education where Attitudes, Subjective Norms – Significant Others, and Subjective Norms – Physician were all affected, the two Subjective Norms variables were impacted to a lesser degree than was Attitudes.

Results of the current study suggest that one's perceptions of others' beliefs toward a behaviour (i.e., Subjective Norms) are more difficult to modify than one's own attitudes towards a behaviour. This makes sense since subjective norms are external to the individual and separate from their experiences, including educational interventions. After having received an educational intervention, one may change their attitude towards a behaviour but that does not mean that their significant others, who likely do not have the benefit of the educational intervention, will also change their attitudes towards the behaviour. An educational intervention is also more likely to change attitudes and beliefs about a behaviour than perceived control towards a behaviour. Speaking more generally, it is clear that attitudes and beliefs for some patient-initiated strategies for depression and low mood are more easily impacted by educational interventions than others. In the case of the current study, attitudes and beliefs towards Education as a patient-initiated strategy improved significantly more than attitudes and beliefs towards Psychotherapy, for example. The findings also suggest that a dosage effect likely exists for educational

interventions. The educational intervention in the present study was a one-time exposure to educational material using one modality (i.e., internet-based text reading). Multiple exposures to the same Knowledge Translation and Knowledge Transfer theory-based information using multiple modalities (e.g., reading, video, and lecture) is likely to have a greater impact on attitudes and beliefs toward these patient-initiated strategies. The present study did not reveal significant overall changes in Subjective Norms – Significant Others and Perceived Behavioural Control, nor were significant changes observed in all attitudes and beliefs related to all of the individual patient-initiated strategies. However, it can be argued that since an effect was observed in the case of the Education strategy, more intensive educational interventions (i.e., greater exposure, multiple modalities) aimed at improving attitudes and beliefs towards other patient-initiated strategies for depression and low mood may improve all of the TPB antecedent variables, to varying degrees, for all of the patient-initiated strategies for depression and low mood, to varying degrees.

While all attempts were made to improve ratings of all of TPB antecedent variables equally, or decrease ratings in the case of Pet Therapy, with the Knowledge Translation and Knowledge Transfer theory-based educational intervention, it is likely that any one package of information influences one or two of the antecedent variables more than the others. For example, the information package included as part of the educational intervention for the current study included endorsement by various physician professional organizations (e.g., Canadian Medical Association, Canadian Psychiatric Association). This piece of information is more likely to impact Subjective Norms – Physicians than Subjective Norms – Significant Others. Indeed, results revealed a greater increase in Subjective Norms – Physicians than in Subjective Norms – Significant Others. Had the educational intervention included information that spoke to the

immense popularity among various patient groups for a particular patient-initiated strategy for depression and low mood, it is fair to assume that a greater improvement in scores of Subjective Norms – Significant Others would result. This finding suggests that educational interventions can be tailored to meet the educational needs of the audience. In the case of patient-initiated strategies for depression and low mood, the focus of educational interventions should be on Perceived Behavioural Control, apparently the most difficult TPB antecedent variable to change but also the most important in this context.

***Negative educational intervention*.** While only one of the educational interventions was aimed at lowering attitudes and beliefs towards a strategy for managing depression and low mood (i.e., Pet Therapy), the effect observed was stronger than that observed in any of the positive educational interventions. Attitudes and Subjective Norms – Physicians for Pet Therapy were significantly lowered following a negative educational intervention and were lowered to a greater degree, based on effect size, than the positive educational intervention was able to achieve on any of the antecedent variables for patient-initiated strategies for depression and low mood. Although this intervention was only attempted in one case, this finding suggests that a negative educational intervention (i.e., one that dissuades a particular behaviour) based on Knowledge Translation and Knowledge Transfer theory appears to be particularly effective at changing attitudes and beliefs about a behaviour.

Impact of educational interventions on intentions. Global intentions to engage in patient-initiated strategies for depression and low mood do not appear to be influenced by Knowledge Translation and Knowledge Transfer theory-based educational interventions. The findings do not support the hypothesis that a Knowledge Translation and Knowledge Transfer theory-based educational intervention would improve ratings of intentions to engage in these

strategies. In the case of Pet Therapy, the negative educational intervention failed to reduce ratings of intentions to engage in the behaviour. As with the antecedent variables, this may be due to a dosage effect or the single modality in which the educational information was presented.

Although it was hypothesized that the educational interventions would impact Intentions to engage in patient-initiated strategies for depression and low mood, TPB suggests that intentions flows from attitudes and beliefs and any impact on intentions would likely be less than that observed in the case of antecedent variables. Changes in attitudes and beliefs towards a behaviour are believed to bring about changes in intentions. Intentions are not the direct target of educational interventions since the construct of intentions is more difficult to operationalize than attitudes or beliefs. Given that the educational intervention had only a weak to moderate impact on ratings of Attitudes and Subjective Norms – Physicians and no impact whatsoever on Perceived Behavioural Control, the most significant predictor of intentions, it is not surprising that Intentions were not significantly impacted by the educational intervention. It might be concluded, therefore, that any educational intervention would have a trickle down effect through TPB. Because an educational intervention directly influences attitudes and beliefs (i.e., the antecedent variables), it can be expected that these variables would be impacted the most. Any changes in these antecedent variables will impact Intentions, but likely to a lesser degree due to the indirect relationship between the educational intervention and Intentions.

Impact of educational interventions on actual engagement. Actual engagement in patient-initiated strategies for depression and low mood was not significantly impacted by the educational intervention based on Knowledge Translation and Knowledge Transfer principles. This finding does not support the hypothesis that an educational intervention such as this would improve frequency of engagement in these strategies. As discussed previously, this finding may

be the result of the minimal dosage of educational intervention used in the present study (i.e., one time exposure to one modality). Furthermore, the educational intervention used attempted to target all attitudes and beliefs, but did little to influence Perceived Behavioural Control, the greatest predictor of intentions, which subsequently would have influenced actual engagement.

The results of the actual engagement analyses and those of analyses involving other variables in TPB suggest that an educational intervention has a varied impact on the different variables of the model. An educational intervention such as that used in this study clearly has the greatest impact on the antecedent variables of TPB. This is no surprise since the information presented in the educational interventions was tailored to have an effect on these variables. The impact on intentions to engage in patient-initiated strategies for depression and low mood may be directly influenced by the educational intervention, but, in accordance with theory, is more likely to be influenced by changes in the antecedent variables. Finally, actual engagement appears to be influenced little by the intervention itself, but is likely to be most influenced by changes in intentions. In this way, as previously mentioned, the educational intervention appears to have a trickle-down effect from antecedent variables, to intentions, and finally to actual engagement. In order for an educational intervention of this nature to have a greater impact on intentions and actual engagement, it must carefully target those antecedent variables with the greatest predictive ability on intentions (i.e., Perceived Behavioural Control) and must do so through multiple modalities and multiple exposures (i.e., increased dosage).

Theoretical Implications and Applications

A number of theoretical implications and applications are suggested based on the findings of the current study. From suggested modifications to TPB model and the theoretical framework of Knowledge Translation, Knowledge Transfer, and K* to the practical applications at the level

of primary health care and public health, the findings of this study will inform future research and practice in this field.

Theoretical Implications

TPB was demonstrated to be a useful theoretical framework in which to understand behaviour change in the context of patient-initiated strategies for depression and low mood. While the current study suggests the addition of two variables (i.e., level of mood difficulty, problem appreciation) in this context, this model of behaviour change can be used in future research on this topic to investigate more precisely the influence of attitudes and beliefs on intentions and actual engagement in patient-initiated strategies.

The findings of the current study also suggest that K*, and Knowledge Translation and Knowledge Transfer specifically, on their own are not sufficient for understanding of the impact of the passage of knowledge on behaviour. The hybrid model proposed as part of the current study (Figure 2) integrates Knowledge Translation and Knowledge Transfer principles and TPB to provide a more full conceptualization of the flow of knowledge from one entity to another in a way that changes behaviour in the recipient. As behaviour change is ultimately the purpose of K* interventions, K* theory would benefit greatly from implications of this hybrid model.

Need for Educational Interventions on Self-management

The finding that half of the participants in this study were unable to readily identify strategies for managing mood and various evidence-based patient-initiated strategies for depression were mentioned by less than one quarter of the participants highlights the importance of having both a better understanding of behaviour change in this context and effective educational interventions to improve engagement in these behaviours. Some of the most effective patient-initiated strategies for depression (e.g., Bibliotherapy, Medication) appear to be

viewed quite poorly by the female undergraduate population. Although the sample does not adequately represent the general population, it can be said that given the effectiveness of these strategies, more should be done to elevate their status among other patient-initiated strategies. It is important to consider that the patient-initiated strategies investigated here are relevant to everyone, Medication Adherence and Psychotherapy excluded, regardless of one's level of depressive symptoms. Therefore, mass interventions aimed at improving attitudes, beliefs, and intentions toward these strategies are appropriate and are likely to help reduce the burden of depression in general.

Educational Interventions

The findings from the present study suggest that efforts to improve intentions to engage in behaviour related to patient-initiated strategies for depression and low mood should focus primarily on enabling individuals (i.e., Perceived Behavioural Control) and improving perceptions of individuals' ability to engage in specific behaviours. Whether through activity scheduling-type exercises or providing patients with the necessary resources to engage in the behaviour, health care providers must take a more active role in encouraging the use of patient-initiated strategies. These findings suggest a change in mindset among health care providers. Patient-initiated strategies, or self-management strategies, require the intervention of health care providers and public health resources in order to be adopted by patients and the general population. These strategies cannot be ignored by the health care system under the impression that patients left to their own devices will engage in these strategies willingly and effectively in response to mood difficulties. In essence, patient-initiated strategies must not be patient-alone strategies.

The findings suggest that an individual's level of depressive symptoms need not be a consideration when applying educational interventions aimed at changing behaviour related to patient-initiated strategies for depression and low mood. Therefore, in clinical settings, any TPB interventions aimed at improving actual engagement in patient-initiated strategies do not need to be modified based on the level of depressive symptoms of the patient. This has significant implications for public health interventions in that it supports the use of one-size-fits-all interventions for increasing the frequency of behaviour that will improve mood. These findings do suggest, however, that it is important to understand an individual's subjective measure of their mood than to rely on measures of depressive symptoms when considering the introduction of patient-initiated strategies for depression and low mood. Those patients who subjectively feel they have a positive mood, despite qualitative measures indicating otherwise, are unlikely to engage in patient-initiated strategies for depression and low mood regardless of the type of educational intervention applied.

Findings encourage clinicians and public health educators to use multiple exposures and a variety of modalities to convey Knowledge Translation and Knowledge Transfer theory-based information to the general population for the purpose of changing attitudes and beliefs towards patient-initiated strategies for depression and low mood. As observed in the present study, a single-modality, single-exposure educational intervention was effective at changing attitudes and beliefs towards these strategies in some cases. The change, however, was to a limited degree and, due to the trickle down nature of influence that an educational intervention appears to have on the variables in TPB model, had little to no impact on intentions to engage in or actual engagement in the patient-initiated strategies themselves. Furthermore, those developing and providing educational interventions may wish to incorporate negative education aimed at

dissuading people from using unhealthy strategies for depression and low mood (e.g., alcoholism, drug use, avoidance). When developing information packages for educational intervention, interveners would be wise to use evidence-based information tailored to the targeted TPB antecedent variables, Perceived Behavioural Control most notably.

Limitations

Survey Methods

One of the greatest limitations of the current study is the survey-based nature of data collection and all of the inherent difficulties associated with this approach. A significant challenge associated with this method of data collection is the inability to control for extraneous variables (e.g., participant life events, media exposure to self-management topics) during the data collection process any of which may have produced an effect assumed to be the result of the study intervention. The vast majority of the participants were students who were required to participate in a research project as part of their coursework. The degree of attention and concentration among participants, although controlled partially with the application of a minimal time for completion criterion, was largely unknown and therefore random responding and inattentiveness to the interventions was possible. This type of responding may have masked any true effects that the interventions may have had. It may have also been the case that certain participants chose to engage in additional research on patient-initiated strategies for depression and low mood prior to the study or during the study. Not knowing how participants approached the survey or the intervention itself is likely to have introduced undesirable variability in the data, either masking significant results (i.e, Type 1 error) or exaggerating differences that were in fact meaningless (i.e., Type 2 error). Future research in this field may wish to exert more control over data collection and intervention through in-person participation. While these specific

limitations may have introduced some unwanted variability in the data, the size of the sample and the effect sizes observed suggest that the findings are relatively robust.

Unknown Participant Characteristics

In an effort to keep the survey to a manageable length, a number of participant characteristics were left unknown. Characteristics that would have provided a better understanding of the sample, and consequently a better understanding of the generalizability of the study findings, included socio-economic status, field of study (i.e., Psychology or Linguistics), cultural background, mother tongue, and reading level. Future studies may wish to focus greater attention on these demographic characteristics.

Sample Composition

Although the sample size was adequate and provided enough power in analyses to reveal meaningfully significant results, the composition of the sample was less than ideal. The sample was overwhelmingly female undergraduate students. In addition to causing difficulties with generalizability to men, the sample also makes it difficult to generalize the results to less educated, older, and likely lower socio-economic populations. Given the institutional setting in which the survey and intervention were administered, the findings of the current study are more akin to public health or organizational health applications than primary care or tertiary care applications. Although some of the participants were recruited through general practitioners' offices, their numbers were not sufficient to conduct individual analyses. The generalizability is also limited to individuals with access to a computer and an Internet connection. Suggestions for future direction would include focusing recruitment efforts to the general population as well as more specific populations such as general practitioners' offices and tertiary care settings.

Theory of Planned Behavior Variable Measurement

While TPB questions created for the purpose of this study clearly had face validity, it is reasonable to assume that some of the true variability in Attitudes, Subjective Norms – Significant Others, Subjective Norms – Physician, and Perceived Behavioural Control for the patient-initiated strategies was not fully captured by the individual questions used. As a result, the overall validity of TPB model presented with these questions is not ideal and should be examined with some caution. TPB questions used in the current study were constructed in accordance with recommended guidelines (Francis et al, 2004). In an effort to manage the length of the survey, multiple questions for each of TPB variables (e.g., Attitudes, Subjective Norms – Significant Others, Intentions) were not used in the current study. Doing so would have been ideal in that it would have provided multiple indicators for each construct and, therefore, provided a more accurate measurement of the construct. It is recommended that future research in this field use multiple indicators for each construct.

Common method variance may also be a limitation to the current study, particularly in the case of TPB questions. As participants' familiarity with TPB questions increased, their responses to those questions may have changed. This bias is most notable and problematic between the baseline and post-intervention TPB questions. Although this bias is certainly present to some degree, its effects were likely mitigated through the use of a sham intervention.

Variability between Strategies

The findings of this study suggest that the behaviour itself (e.g., exercising, socializing) explains more of the variability in TPB factors than the stated purpose of a behaviour (e.g., to improve mood). Not all patient-initiated strategies can be grouped together in an investigation of TPB model due to the degree of variability that exists between the attitudes and beliefs related to

these individual strategies. A thorough understanding of TPB with regard to each of these strategies would better achieved by examining each strategy in turn. This may be achieved through identifying specific behaviours related to each of the patient-initiated strategies and using multiples indicators associated with each of TPB constructs (i.e., attitudes, subjective norms, perceived behavioural control, intentions). Furthermore, more precise measurement of actual engagement would also provide a more fulsome investigation of the model. In addition to frequency, future investigations involving actual engagement might also include duration, intensity, and experience.

Depressive Symptoms Measurement

Only one depressive symptoms measure was used in the current study and no collateral information was used to determine participants' level of depressive symptoms (e.g., clinical interview, chart review, etc.). While the PHQ-9 has been demonstrated to effectively identify depressive symptoms, it is not perfectly sensitive or specific and the resulting variability may have impacted the analyses involving depressive symptoms. A lack of specificity may have resulted in false positives or false negatives and, therefore, analyses comparing groups with varying levels of depressive symptoms may have been less precise. Furthermore, the current study did not provide a subjective rating of mood or depressive symptoms. Given the subjective nature of TPB, a subjective rating of mood, depressive symptoms, and affect in general may have been more appropriate. Finally, different types of affect and concomitant variables were not considered in the current study. Future studies may wish to utilize multiple sources, including participants' subjective experience of affect, to determine level of depressive symptoms and general affect.

Open-response Question

While the current study attempted to gain an understanding of participants' knowledge of patient-initiated strategies for depression low mood prior to the baseline and intervention phases of part 1 of the study using an open-response question, this question failed to provide much needed information regarding which strategies are currently used by people. The results revealed the strategies that people most often identify but did not identify those strategies that people actually use when they experience low mood or depression. Observational methods would be a more reliable method of uncovering the types and frequency of these behaviours. Understanding which patient-initiated strategies for depression and low mood are used by the general population and how would provide a better context for applying educational interventions to improve engagement in the most effective strategies.

Type I Error

A large number of analyses were conducted as part of this study and no corrections to *p* values were made. As explained previously, the *p* value remained at .05 due to the exploratory nature of the investigation. Furthermore, many of the significant results were significant at the $p < .01$ or the $p < .001$ levels and would likely have remained significant even if a Bonferroni or other correction had been applied. That being said, it is, of course, possible that type I error has occurred somewhere within the findings of the current study. This is a limitation of the current study and can only be remedied by replication.

Conclusion

Patient-initiated strategies for self-management of depression and low mood offer effective intervention options for individuals experiencing low mood or depression and have the potential to address the limited capacity of the primary care system to manage the growing

burden of depression and low mood (Ferrari et al., 2012; Jorm et al., 2004; Richards, 2012). The findings of the current study suggest that TPB model is an appropriate theoretical framework through which behaviour change in the context of these patient-initiated strategies can be investigated. Perceived Behaviour Control is the greatest predictor of intentions to engage in these strategies and Attitudes explains a smaller portion of the variance in intentions. In some cases, intentions appear to significantly predict actual engagement as expected in the model.

Level of depressive symptoms, an indicator of affect, was not found to directly impact any of TPB variables yet did impact actual engagement in some of the patient-initiated strategies. Since it is unclear how level of mood difficulty fits into the overall model, two additional variables are suggested to compliment the core TPB variables in this context. The first, level of mood difficulty, is meant to control for the impact of depressive symptoms on the model. It is unclear where a mood difficulty variable may fit in the larger model, but it is expected that it may moderate some of the relationships between TPB variables in this context. The second additional variable is specific to the context of patient-initiated strategies for mental disorders. "Problem appreciation" quantifies the degree to which an individual with mental health challenges acknowledges their difficulties and, therefore, perceives a patient-initiated strategy as relevant to their current condition. The more relevant a particular behaviour is to an individual, the better TPB explains the relationship between their attitudes and beliefs and their intentions to engage in the behaviour.

Whether integrated as a component of a stepped-care model or simply added as adjunct treatment to practice as usual, educational interventions aimed at improving attitudes, beliefs, intentions, and engagement in patient-initiated strategies are an integral part of any campaign moving forward. The findings of the current study provide a better understanding of behaviour

change in the context of these strategies and they suggest that level of depressive symptoms and affect in general need not be a significant consideration in an educational intervention or behaviour change in general. The findings do suggest, however, that a multi-modal, multiple-exposure educational intervention will have the greatest impact on beliefs and attitudes towards these strategies, which, in turn, will have a positive trickle down effect on intentions to engage in these strategies and, ultimately, actual engagement. The greatest focus should be placed on changing self-efficacy (i.e., Perceived Behavioural Control) and attitudes related to these patient-initiated strategies for depression and low mood. The findings of the current study suggest that educational interventions based on Knowledge Translation and Knowledge Transfer theory have the potential, with additional modalities and greater exposure, to significantly improve attitudes and beliefs related to patient-initiated strategies for depression and low mood and ultimately reduce the burden of depression through increased engagement in these behaviours.

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Appendix A – K* Information for Each Patient-Initiated Treatment for Depression

Introduction to strategies for managing sad or depressed mood.

There are many ways that a person can improve sad or depressed mood. The following strategies have been shown through scientific research to benefit most people suffering from low mood or depression. Whether or not you are dealing with sad mood right now, we would like to know your opinions about each of the following eight strategies for dealing with sad or low mood. Please answer all of the questions even if you feel a certain strategy does not currently apply to you.

Click forward to continue.

BIBLIOTHERAPY

Strategy #1: Self-Help Books

Reading a self-help book for depression has been shown in scientific research to significantly improve mood.

THE RESEARCH: In a primary care study 38 patients were each assigned to one of two groups. The first group received treatment as usual from their physician (commonly antidepressant medication). The second group was simply asked to read the book *Feeling Good: The New Mood Therapy* by Dr. David Burns. Both groups improved equally well and those who read the book improved without taking any medication (Naylor, 2010).

HOW IT WORKS: A good self-help book is easy to understand. It will provide information about depression and help you understand that you are not alone in your struggle with low mood. Self-help books also describe simple ways to change your thoughts, behaviours and emotions and all at your own pace!

WHO RECOMMENDS SELF-HELP BOOKS: The use of self-help books is recommended by the **Canadian Psychiatric Association** in its current clinical practice guidelines for depression and low mood (CPA, 2001).

(**Sources**)

EXERCISE

Strategy #2: Excercise

Light, regular physical exercise can improve mood and functioning.

THE RESEARCH: In a British studied 38 patients with depression. Half of the patients were placed in a group that completed 30 minutes of walking each day for a period of 10 days. The other group did 30 minutes of relaxation exercises each day for 10 days. In the end, three times more patients in the walking group had significant improvement in their mood than did patients in the relaxation group.

HOW IT WORKS: There are many ways that exercise improves your mood. For example, exercise releases chemicals in your brain that in turn trigger the parts of your brain associated with good mood. Exercise improves body image and physical health, which improves self-esteem and mood. Exercise is a great stress reliever and less stress means better mood.

WHO RECOMMENDS EXERCISE: A wide variety of professional healthcare organizations recommend exercise as a way of improving mood. Most notably the **Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) and the **Canadian Psychiatric Association** (CPA, 2009) both recommend exercise as treatment for depression.

(**Sources**)

LIGHT

Strategy #3: Light

Full-spectrum light (i.e., light from the sun or a "light therapy" lamp) can improve mood and functioning.

THE RESEARCH: One study placed 102 patients with non-seasonal depression into two groups. One group received one hour of bright light each morning for five weeks. The other group received one hour of low light each morning. The bright light group had significantly improved mood following the study.

HOW IT WORKS: Natural light and light from light-therapy works in two ways to improve mood. Firstly, it increases the amount of neurotransmitters (brain chemicals) associated with heightened mood (e.g., serotonin, dopamine). Secondly, when timed appropriately, every morning for example, light therapy helps sync your body's rhythm (circadian rhythm) with the your sleep-wake cycle.

WHO RECOMMENDS LIGHT THERAPY: The **Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) recommends light therapy for people who experience depression primarily in the winter months. The **American Psychiatric Association** recommends light therapy for seasonal as well as nonseasonal depression.

(**Sources**)

REGULAR MEDICATION

Strategy #4 - Taking Prescribed Medication as Directed

If your physician has prescribed medication to help you manage your low mood, taking that medication regularly as directed can significantly improve your mood.

THE RESEARCH: In a study published in the Journal of the American Medical Association, it was discovered that the patients who took their antidepressant medication regularly were 25% more likely to feel that the medication is helping their mood than those who did not take their medication regularly. Seventy-five percent of individuals who took their medication regularly had a 50% or greater reduction in their depressive symptoms! Less than half of those who did not take their medication regularly had the increase in mood.

HOW IT WORKS: Some of the most common medications prescribed for low mood and depression require time for the drug to build up in the body before it has the desired effect. Taking medication regularly allows the drug to work the way it is intended. Following your doctor's directions for taking medication is important.

WHO RECOMMENDS TAKING MEDICATION AS DIRECTED: All professional healthcare organizations recommend taking medications as prescribed including the **Canadian Medical Association** and the **Canadian Psychiatric Association** (CPA, 2001).

(**Sources**)

PSYCHOEDUCATION

Strategy #5: Knowing more about Depression

Just knowing more about depression can help reduce the symptoms of depression.

THE RESEARCH: One hundred and sixty six individuals with depression were asked to simply read a webpage (like this one) that provided information about depression. Those individuals who learned more about depression saw a significant reduction in depressive symptoms. Furthermore, people who learned more about depression were more likely to make recoveries than those who had not learned more.

HOW IT WORKS: Knowing more about what low mood and depression look like can help you identify it when it happens to you and get help sooner. Learning about how depression is treated might help you feel more comfortable seeking help. Knowing more about what causes low mood and depression can help you take steps to maintain a positive mood.

WHO RECOMMENDS EDUCATION: Among the many organizations that recommend education for people experiencing low mood or depression, the **College of Family Physicians of Canada** (CFPC, 2007) and the **Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) also recommend education.

(**Sources**)

PSYCHOTHERAPY

Strategy #6: Psychotherapy (Talk Therapy)

Psychotherapy or talk therapy is considered to be one of the most effective treatments for low mood or depression.

THE RESEARCH: Cognitive behaviour therapy (CBT) is widely considered to be a first-line, non-medication treatment for depression. In one study, 40 primary care patients with depression were randomly assigned to one of two groups. The first group received CBT from a qualified mental health professional in addition to care as usual from their physician. They second group simply received care as usual from their physician. In addition to showing a greater reduction in depressive symptoms, the patients that received CBT were also more likely to be without depression and medication free two years after finishing therapy. In fact, patients that did not complete CBT were four times more likely to relapse.

HOW IT WORKS: Through weekly 1-hour sessions with a qualified professional, CBT teaches skills that help one change their behaviour and the way they think. CBT has been shown to actually change the way parts of the brain work meaning the effects of CBT last long after therapy has finished.

WHO RECOMMENDS SEEKING PSYCHOTHERAPY: The **Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) recommends psychotherapy for depression as does the **Canadian Psychiatric Association** (CPA, 2001).

(**Sources**)

BEING SOCIAL

Strategy #7: Being Social

Maintaining healthy relationships with friends and family and starting new relationships can be a great way to improve your mood.

THE RESEARCH: In a study of over 40,000 Norwegians, researchers found that regardless of age or gender, those individuals with greater social support had healthier moods. Social support in this study included emotional support or more tangible sources of support (e.g., help at home).

HOW IT WORKS: When our mood is low, some people isolate ourselves, remove themselves from the company of others. This only serves to worsen one's mood with feeling of loneliness or rejection. Going out with friends to do something fun, even if you don't feel like it, will boost

your mood, which will help you to think more positively. Friends and family will also help encourage you and make you feel better about yourself.

WHO RECOMMENDS VISITING WITH FRIENDS: In their clinical practice guidelines for the treatment of depression, the **College of Family Physicians of Canada** (CFPC, 2007) and the **National Collaborating Centre for Mental Health - National Institute for Health and Clinical Excellence** (NICE, 2009) recommend increased social support and social activities to help improve mood.

(**Sources**)

SYMPTOM MONITORING

Strategy #8: Symptom Monitoring

Monitoring and being aware of your depressive symptoms can actually help increase your mood.

THE RESEARCH: In a study of 386 depressed patients who were prescribed antidepressant medication by the physician, those that took part in a relapse prevention program that included routine monitoring of depressive symptoms saw a greater increase in mood than those who did not monitor symptoms. Those patients who monitored their symptoms were also more likely to follow their physician's directions for treatment.

HOW IT WORKS: Regularly monitoring your symptoms of low mood or depression helps you recognize when you have made improvements and helps you identify strategies or experiences that have helped improve your mood. Monitoring symptoms also helps you recognize when your mood is getting lower allowing you to intervene sooner.

WHO RECOMMENDS SYMPTOM MONITORING: The **National Institute for Health and Clinical Excellence** (NICE, 2009) recommends symptom monitoring in its latest clinical practice guidelines for the treatment of depression and low mood.

(**Sources**)

Appendix B – Pet Therapy Negative Educational Intervention

While there are a number of self-help strategies that are effective in managing depression and sad mood, there are other strategies that ARE NOT effective in improving mood. These unhelpful strategies have been shown, through scientific research, to be of no to little benefit to those who have used them. Whether or not you are dealing with sad mood right now, we would like to know your opinions about the last strategy below. Please answer all of the questions below even if you feel a certain strategy does not currently apply to you.

PET THERAPY

Owning a pet or interacting with therapy animals has NOT been shown in scientific research to significantly improve mood.

THE RESEARCH: In a hospital setting, 58 patients with depression or low mood were each randomly assigned to one of two groups. The first group participated in five days of pet therapy. The second group participated in an unrelated program. Those who participated in pet therapy had NO CHANGE in their level of depressive symptoms. (Zisselman, Rovner, Shmuely, & Ferrie, 1996).

WHY IT DOESN'T WORK: It was thought that pets or interactions with animals offer some of the same benefits as human socializing; however, this is not the case. Animals do not offer the practical support that humans offer (for example, helping out with chores, providing transportation) and they do not offer the compassion and emotional understanding of humans.

NO RECOMMENDATIONS: The use of pet therapy is NOT recommended by the **Canadian Psychiatric Association** (CPA 2009), **The Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) or any other professional body in Canada.

(**Source)**

Appendix C – Sham Interventions

Psychoeducation

Writing is the representation of language in a textual medium through the use of a set of signs or symbols (known as a writing system). It is distinguished from illustration, such as cave drawing and painting, and non-symbolic preservation of language via non-textual media, such as magnetic tape audio. Writing most likely began as a consequence of political expansion in ancient cultures, which needed reliable means for transmitting information, maintaining financial accounts, keeping historical records, and similar activities.

Light Therapy

Historians Robert Friedel and Paul Israel list 22 inventors of incandescent lamps prior to Joseph Swan and Thomas Edison. They conclude that Edison's version was able to outstrip the others because of a combination of three factors: an effective incandescent material, a higher vacuum than others were able to achieve (by use of the Sprengel pump) and a high resistance that made power distribution from a centralized source economically viable.

Exercise

The Ancient Olympic Games were athletic festivals held every four years at the sanctuary of Zeus in Olympia, Greece. Competition was among representatives of several city-states and kingdoms of Ancient Greece. These Games featured mainly athletic but also combat and chariot racing events. During the Games, all conflicts among the participating city-states were postponed until the Games were finished. This cessation of hostilities was known as the Olympic peace or truce.

Social Support

Friendship was a topic of moral philosophy in which was greatly discussed by Plato, Aristotle, and Stoics. This was less discussed in the modern era, until the re-emergence of contextualist and feminist approaches to ethics. Openness in friendship was seen as an enlargement of the self; Aristotle wrote, "The excellent person is related to his friend in the same way as he is related to himself, since a friend is another self; and therefore, just as his own being is choiceworthy him, the friend's being is choice-worthy for him in the same or a similar way.” In Ancient Greek, the same word was used for "friend" and "lover”.

Symptom Monitoring

The study of psychology in a philosophical context dates back to the ancient civilizations of Egypt, Greece, China, India, and Persia. Historians point to the writings of ancient Greek philosophers, such as Thales, Plato, and Aristotle (especially in his De Anima treatise), as the first significant body of work in the West to be rich in psychological thought. As early as the 4th century BC, Greek physician Hippocrates theorized that mental disorders were of a physical, rather than divine, nature.

Psychoeducation

The term depression was derived from the Latin verb deprimere, "to press down". From the 14th century, "to depress" meant to subjugate or to bring down in spirits. It was used in 1665 in English author Richard Baker's Chronicle to refer to someone having "a great depression of spirit", and by English author Samuel Johnson in a similar sense in 1753.

Prescribed Medications

Psychoactive drug use is a practice that dates to prehistoric times. There is archaeological evidence of the use of psychoactive substances (mostly plants) dating back at least 10,000 years, and historical evidence of cultural use over the past 5,000 years. The chewing of coca leaves, for example, was found to date back over 8000 years ago in Peruvian society.

Psychotherapy

Philosophers and physicians from these schools practised psychotherapy among the Greeks and Romans from about the late 4th century BC to the 4th century AD. Psychoanalysis was perhaps the first specific school of psychotherapy, developed by Sigmund Freud and others through the early 20th century. Trained as a neurologist, Freud began focusing on problems that appeared to have no discernible organic basis, and theorized that they had psychological causes originating in childhood experiences and the unconscious mind. Techniques such as dream interpretation, free association, transference and analysis of the id, ego and superego were developed.

Pet Therapy

“The present lineage of dogs was domesticated from gray wolves about 15,000 years ago. Though remains of domesticated dogs have been found in Siberia and Belgium from about 33,000 years ago, none of those lineages seem to have survived the Last Glacial Maximum. Although DNA testing suggests an evolutionary split between dogs and wolves around 100,000 years ago, no fossil specimens prior to 33,000 years ago are clearly morphologically domesticated dog.”

Appendix D – Adapted Primary Health Questionnaire-9

Over the last 2 weeks, how often have you had little interest or pleasure in doing things? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

Over the last 2 weeks, how often have you been feeling down, depressed, or hopeless? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

Over the last 2 weeks, how often have you had trouble falling or staying asleep, or sleeping too much? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

Over the last 2 weeks, how often have you been feeling tired or having little energy? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

Over the last 2 weeks, how often have you had poor appetite or overeating? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

Over the last 2 weeks, how often have you been feeling bad about yourself - or that you are a failure or have let yourself or your family down? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

Over the last 2 weeks, how often have you had trouble concentrating on things, such as reading the newspaper or watching television? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

Over the last 2 weeks, how often have you been moving or speaking so slowly that other people could have noticed? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

Over the last 2 weeks, how often have you been so fidgety or restless that you have been moving around a lot more than usual? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*

~~Over the last 2 weeks, how often have you had thoughts that you would be better off dead or of hurting yourself in some way? *[Responses: Nearly every day, more than half the days, Several days, Not at all]*~~

Source: Patient Health Questionnaire – Depression PHQ9 *Adapted from the PRIME-MD® Patient Health Questionnaire © 1999, Pfizer Inc*

Appendix E – Locus of Health Control

Multidimensional Health Locus of Control Scale – Form C

Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer EVERY ITEM and that you circle ONLY ONE number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

1) If my condition worsens, it is my own behavior which determines how soon I will feel better again.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

2) As to my condition, what will be will be.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

3) If I see my doctor regularly, I am less likely to have problems with my condition.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

4) Most things that affect my condition happen to me by chance.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

5) Whenever my condition worsens, I should consult a medically trained professional.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

6) I am directly responsible for my condition getting better or worse.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

7) Other people play a big role in whether my condition improves, stays the same, or gets worse.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

8) Whatever goes wrong with my condition is my own fault.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

9) Luck plays a big part in determining how my condition improves.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

10) In order for my condition to improve, it is up to other people to see that the right things happen.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)

e. Moderately Agree (5)
f. Strongly Agree (6)

11) Whatever improvement occurs with my condition is largely a matter of good fortune.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

12) The main thing which affects my condition is what I myself do.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

13) I deserve the credit when my condition improves and the blame when it gets worse.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

14) Following doctor's orders to the letter is the best way to keep my condition from getting any worse.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

15) If my condition worsens, it's a matter of fate.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

16) If I am lucky, my condition will get better.
a. Strongly Disagree (1)

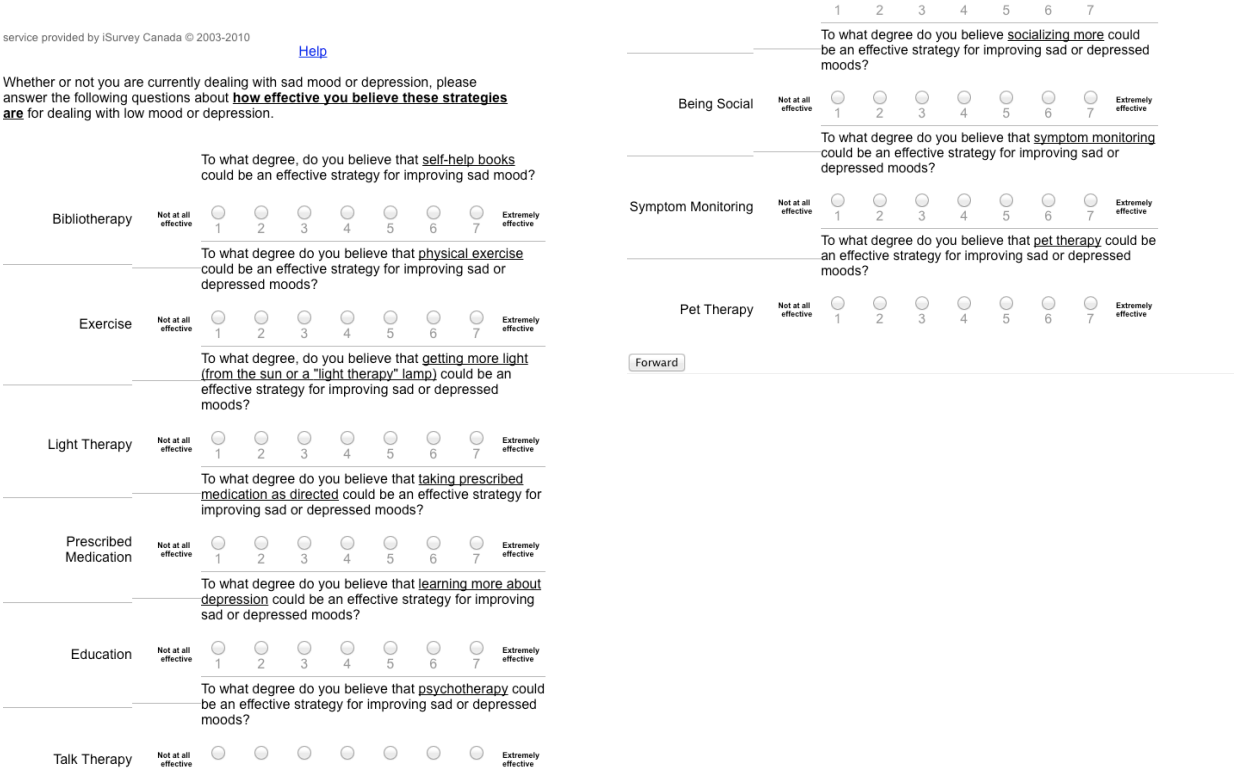
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

17) If my condition takes a turn for the worse, it is because I have not been taking proper care of myself.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

18) The type of help I receive from other people determines how soon my condition improves.
a. Strongly Disagree (1)
b. Moderately Disagree (2)
c. Disagree (3)
d. Agree (4)
e. Moderately Agree (5)
f. Strongly Agree (6)

Appendix F – Baseline Theory of Planned Behavior Questions

Attitude



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Help

Whether or not you are currently dealing with sad mood or depression, please answer the following questions about **how effective you believe these strategies are** for dealing with low mood or depression.

To what degree, do you believe that self-help books could be an effective strategy for improving sad mood?

Bibliotherapy — Not at all effective 1 2 3 4 5 6 7 Extremely effective

To what degree do you believe that physical exercise could be an effective strategy for improving sad or depressed moods?

Exercise — Not at all effective 1 2 3 4 5 6 7 Extremely effective

To what degree, do you believe that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

Light Therapy — Not at all effective 1 2 3 4 5 6 7 Extremely effective

To what degree do you believe that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

Prescribed Medication — Not at all effective 1 2 3 4 5 6 7 Extremely effective

To what degree do you believe that learning more about depression could be an effective strategy for improving sad or depressed moods?

Education — Not at all effective 1 2 3 4 5 6 7 Extremely effective

To what degree do you believe that psychotherapy could be an effective strategy for improving sad or depressed moods?

Talk Therapy — Not at all effective ○ ○ ○ ○ ○ ○ ○ Extremely effective

1 2 3 4 5 6 7

To what degree do you believe socializing more could be an effective strategy for improving sad or depressed moods?

Being Social — Not at all effective 1 2 3 4 5 6 7 Extremely effective

To what degree do you believe that symptom monitoring could be an effective strategy for improving sad or depressed moods?

Symptom Monitoring — Not at all effective 1 2 3 4 5 6 7 Extremely effective

To what degree do you believe that pet therapy could be an effective strategy for improving sad or depressed moods?

Pet Therapy — Not at all effective 1 2 3 4 5 6 7 Extremely effective

Forward

Subjective Norms – Significant Others

Help

Whether or not you are currently dealing with sad mood or depression, please answer the following questions regarding **what you think your significant other, friends or family believe about the effectiveness** of these strategies for dealing with low mood or depression.

To what degree do you think that your significant other, friends or family believe that reading a self-help book could be an effective strategy in improving sad or depressed moods?

Bibliotherapy — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

To what degree do you think that your significant other, family or friends believe that physical exercise could be an effective strategy for improving sad or depressed moods?

Exercise — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

To what degree do you think that your significant other, family or friends believe that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

Light Therapy — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

To what degree to you think that your significant other, friends or family believe that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

Prescribed Medication — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

To what degree do you think that your significant other, friends or family believe that learning more about depression could be an effective strategy for improving sad or depressed moods?

Education — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

To what degree do you think that your significant other, friends or family believe that psychotherapy could be an effective strategy for improving sad or depressed moods?

Talk Therapy — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

To what degree do you think that your significant other, family or friends believe socializing more could be an effective strategy for improving sad or depressed moods?

Being Social — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

To what degree do you think that your significant other, family or friends believe that symptom monitoring could be an effective strategy for improving sad or depressed moods?

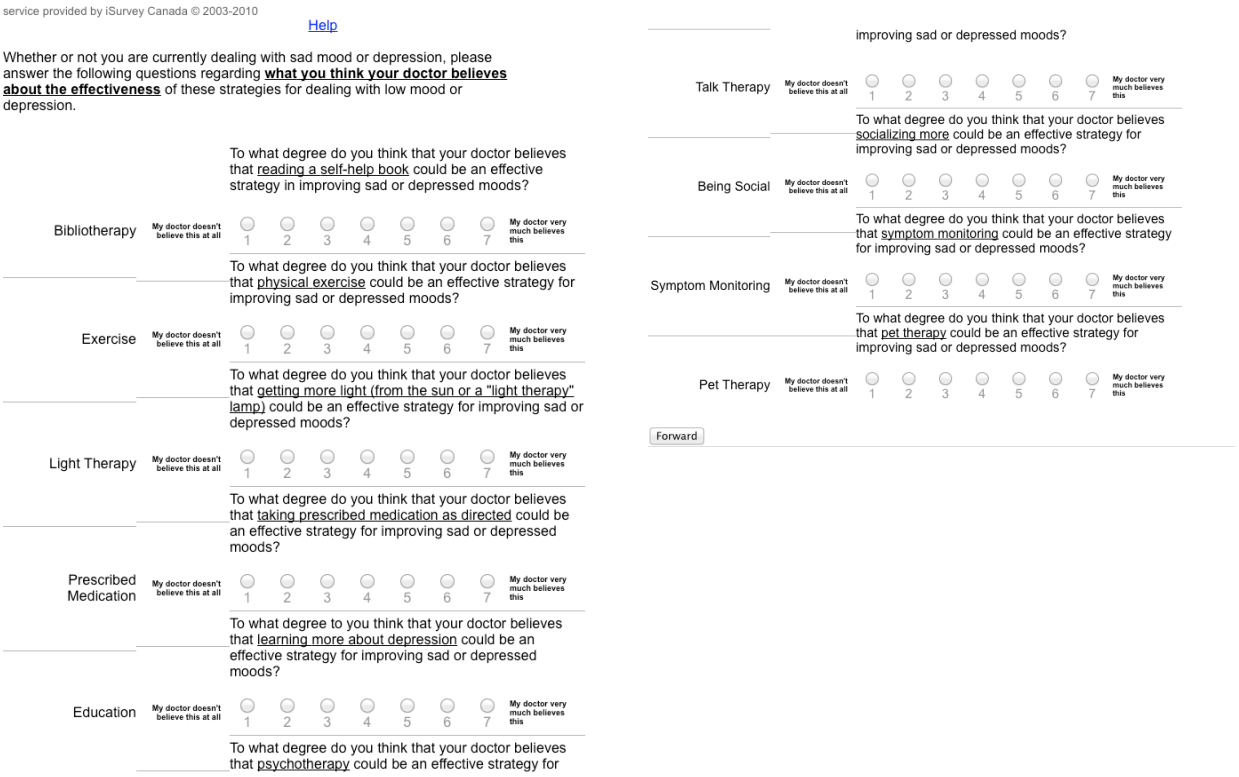
Symptom Monitoring — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

To what degree do you think that your significant other, family or friends believe that pet thearpy could be an effective strategy for improving sad or depressed moods?

Pet Therapy — They don't believe this at all: 1 2 3 4 5 6 7 : They very much believe this

Forward

Subjective Norms – Physician



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Help

Whether or not you are currently dealing with sad mood or depression, please answer the following questions regarding **what you think your doctor believes about the effectiveness** of these strategies for dealing with low mood or depression.

To what degree do you think that your doctor believes that reading a self-help book could be an effective strategy in improving sad or depressed moods?

Bibliotherapy — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

To what degree do you think that your doctor believes that physical exercise could be an effective strategy for improving sad or depressed moods?

Exercise — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

To what degree do you think that your doctor believes that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

Light Therapy — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

To what degree do you think that your doctor believes that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

Prescribed Medication — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

To what degree to you think that your doctor believes that learning more about depression could be an effective strategy for improving sad or depressed moods?

Education — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

To what degree do you think that your doctor believes that psychotherapy could be an effective strategy for improving sad or depressed moods?

Talk Therapy — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

To what degree do you think that your doctor believes socializing more could be an effective strategy for improving sad or depressed moods?

Being Social — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

To what degree do you think that your doctor believes that symptom monitoring could be an effective strategy for improving sad or depressed moods?

Symptom Monitoring — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

To what degree do you think that your doctor believes that pet therapy could be an effective strategy for improving sad or depressed moods?

Pet Therapy — My doctor doesn't believe this at all — 1 2 3 4 5 6 7 — My doctor very much believes this

Forward

Perceived Behavioural Control

Help

Whether or not you are currently dealing with sad mood or depression, please answer the following questions about **how capable you feel of engaging in** these strategies for dealing with low mood or depression.

To what degree do you feel you would be able to pick up (buy or borrow), read and apply a self-help book?

Bibliotherapy — Not at all able 1 2 3 4 5 6 7 Fully able

To what degree do you feel you would be able to include a brief amount of exercise in to your daily routine?

Exercise — Not at all able 1 2 3 4 5 6 7 Fully able

To what degree do you feel you would be able to add a brief amount of light therapy to your daily routine?

Light Therapy — Not at all able 1 2 3 4 5 6 7 Fully able

To what degree do you feel you would be able to take prescribed medication as directed?

Prescribed Medication — Not at all able 1 2 3 4 5 6 7 Fully able

To what degree do you feel you would be able to take a moment to learn more about depression?

Education — Not at all able 1 2 3 4 5 6 7 Fully able

To what degree do you feel you would be able to take part in psychotherapy with a qualified professional?

Talk Therapy — Not at all able 1 2 3 4 5 6 7 Fully able

To what degree do you feel you would be able to spend more time socializing each day this coming week?

Being Social — Not at all able 1 2 3 4 5 6 7 Fully able

To what degree do you feel you would be able to monitor your symptoms?

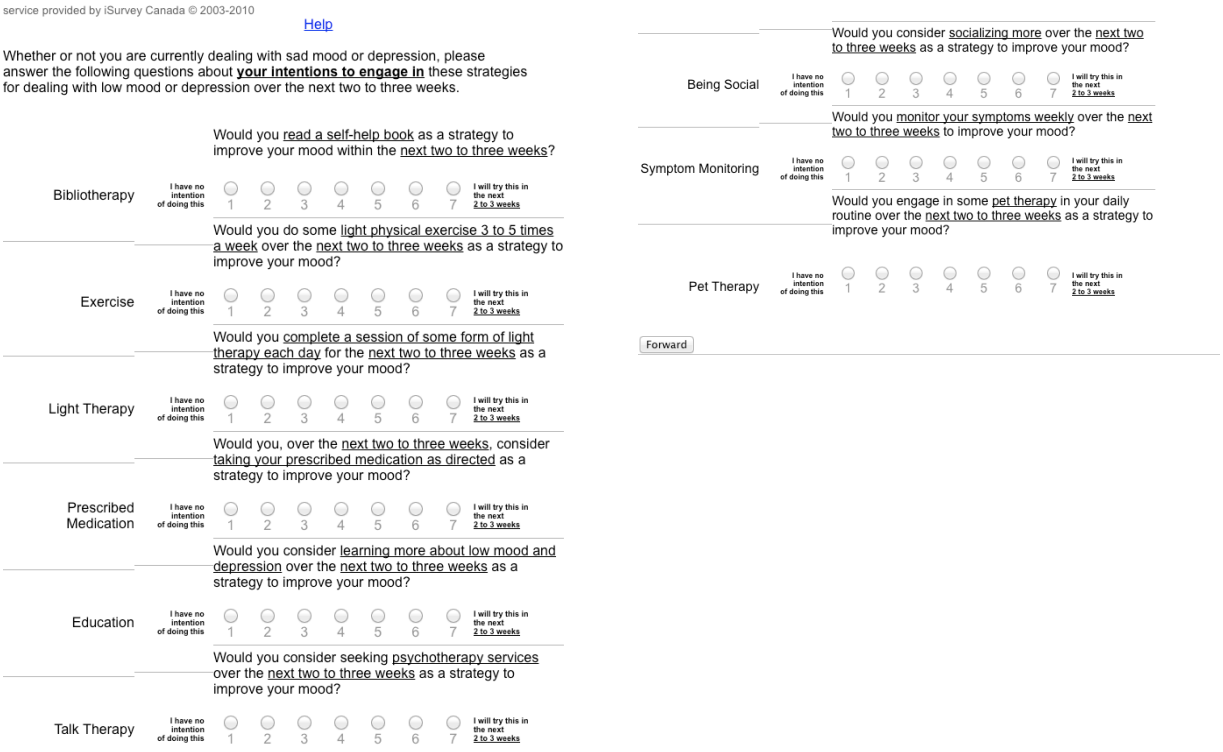
Symptom Monitoring — Not at all able 1 2 3 4 5 6 7 Fully able

To what degree do you feel you would be able to engage in pet therapy?

Pet Therapy — Not at all able 1 2 3 4 5 6 7 Fully able

Forward

Intentions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Help
Whether or not you are currently dealing with sad mood or depression, please answer the following questions about **your intentions to engage in** these strategies for dealing with low mood or depression over the next two to three weeks.
Would you read a self-help book as a strategy to improve your mood within the next two to three weeks?
Bibliotherapy
I have no intention of doing this
1 2 3 4 5 6 7
I will try this in the next 2 to 3 weeks
Would you do some light physical exercise 3 to 5 times a week over the next two to three weeks as a strategy to improve your mood?
Exercise
Would you complete a session of some form of light therapy each day for the next two to three weeks as a strategy to improve your mood?
Light Therapy
Would you, over the next two to three weeks, consider taking your prescribed medication as directed as a strategy to improve your mood?
Prescribed Medication
Would you consider learning more about low mood and depression over the next two to three weeks as a strategy to improve your mood?
Education
Would you consider seeking psychotherapy services over the next two to three weeks as a strategy to improve your mood?
Talk Therapy
Would you consider socializing more over the next two to three weeks as a strategy to improve your mood?
Being Social
Would you monitor your symptoms weekly over the next two to three weeks to improve your mood?
Symptom Monitoring
Would you engage in some pet therapy in your daily routine over the next two to three weeks as a strategy to improve your mood?
Pet Therapy
Forward

Appendix G – Post-Intervention Theory of Planned Behavior Questions Intervention Group

Preamble

Help

Thank you for your continued participation. This is important research. You are almost done this part of the study.

We will now ask you to complete a few of the same questions in a different format. This will allow us to better understand how you communicate with your health care provider.

Introduction to strategies for managing sad or depressed mood.

There are many ways that a person can improve sad or depressed mood. The following strategies have been shown through scientific research to benefit most people suffering from low mood or depression. Please read the scientific support for each strategy then answer the questions for each strategy.

Whether or not you are dealing with sad mood right now, we would like to know your opinions about each of the following eight strategies for dealing with sad or low mood. Please answer all of the questions even if you feel a certain strategy does not currently apply to you.

Click forward to continue.

Forward

Psychoeducation

Strategy #1: Knowing more about Depression

Just knowing more about depression can help reduce the symptoms of depression.

THE RESEARCH: One hundred and sixty six individuals with depression were asked to simply read a webpage (like this one) that provided information about depression. Those individuals who learned more about depression saw a significant reduction in depressive symptoms. Furthermore, people who learned more about depression were more likely to make recoveries than those who had not learned more.

HOW IT WORKS: Knowing more about what low mood and depression look like can help you identify it when it happens to you and get help sooner. Learning about how depression is treated might help you feel more comfortable seeking help. Knowing more about what causes low mood and depression can help you take steps to maintain a positive mood.

WHO RECOMMENDS EDUCATION: Among the many organizations that recommend education for people experiencing low mood or depression, the **College of Family Physicians of Canada** (CFPC, 2007) and the **Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) also recommend education.

The Canadian Psychological Association offers some good information about depression. Visit this website.

(**Sources**)

Please answer the following questions about learning more about depression as a strategy for improving your moods.

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you believe that learning more about depression could be an effective strategy for improving sad or depressed moods?

	1	2	3	4	5	6	7	
Not at all effective	○	○	○	○	○	○	○	**Very effective**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your significant other, friends or family believe that learning more about depression could be an effective strategy for improving sad or

depressed moods?

	1	2	3	4	5	6	7	
They don't believe this at all	○	○	○	○	○	○	○	**They very much believe this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your doctor believes that learning more about depression could be an effective strategy for improving sad or depressed moods?

	1	2	3	4	5	6	7	
My doctor doesn't believe this at all	○	○	○	○	○	○	○	**My doctor very much believes this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you feel you would be able to take a moment to learn more about depression?

	1	2	3	4	5	6	7	
Not at all able	○	○	○	○	○	○	○	**Fully able**

Keeping in mind that scientific evidence supports this self-help strategy, would you consider learning more about low mood and depression (for example reading this information sheet or other resources) over the next two to three weeks as a strategy to improve your mood?

	1	2	3	4	5	6	7	
I have no intention of doing this	○	○	○	○	○	○	○	**I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Bibliotherapy

Strategy #2: Self-Help Books

Reading a self-help book for depression has been shown in scientific research to significantly improve mood.

THE RESEARCH: In a primary care study 38 patients were each assigned to one of two groups. The first group received treatment as usual from their physician (commonly antidepressant medication). The second group was simply asked to read the book *Feeling Good: The New Mood Therapy* by Dr. David Burns. Both groups improved equally well and those who read the book improved without taking any medication (Naylor, 2010).

HOW IT WORKS: A good self-help book is easy to understand. It will provide information about depression and help you understand that you are not alone in your struggle with low mood. Self-help books also describe simple ways to change your thoughts, behaviours and emotions and all at your own pace!

WHO RECOMMENDS SELF-HELP BOOKS: The use of self-help books is recommended by the **Canadian Psychiatric Association** in its current clinical practice guidelines for depression and low mood (CPA, 2001).

Here is a **link** to a book store that has *Feeling Good: The New Mood Therapy* book in stock and available for order.

(**Sources**)

Please answer the following questions about self-help books as a strategy for improving your moods.

Keeping in mind that scientific evidence supports this self-help strategy, to what degree, do you believe that self-help books could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your significant other, friends or family believe that reading a self-help book could be an effective strategy in improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your doctor believes that reading a self-help book could be an effective strategy in improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you feel you would be able to pick up (buy or borrow), read and apply a book like *Feeling Good: The New Mood Therapy* by Dr. David Burns?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind that scientific evidence supports this self-help strategy, would you read a self-help book, like *Feeling Good: The New Mood Therapy*, as a strategy to improve your mood, within the next two to three weeks?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Exercise

Strategy #3: Excercise

Light, regular physical exercise can improve mood and functioning.

THE RESEARCH: In a British studied 38 patients with depression. Half of the patients were placed in a group that completed 30 minutes of walking each day for a period of 10 days. The other group did 30 minutes of relaxation exercises each day for 10 days. In the end, three times more patients in the walking group had significant improvement in their mood than did patients in the relaxation group.

HOW IT WORKS: There are many ways that exercise improves your mood. For example, exercise releases chemicals in your brain that in turn trigger the parts of your brain associated with good mood. Exercise improves body image and physical health, which improves self-esteem and mood. Exercise is a great stress reliever and less stress means better mood.

WHO RECOMMENDS EXERCISE: A wide variety of professional healthcare organizations recommend exercise as a way of improving mood. Most notably the **Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) and the **Canadian Psychiatric Association** (CPA, 2009) both recommend exercise as treatment for depression.

See the Public Health Agency of Canada's tips for physical activity **here**.

(**Sources**)

Please answer the following questions about physical exercise as a strategy for improving your moods.

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you believe that physical exercise could be an effective strategy for improving sad or depressed moods?

Not at all effective ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Very effective**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your significant other, family or friends believe that physical exercise could be an effective strategy for improving sad or depressed moods?

They don't believe this at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **They very much believe this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your doctor believes that physical exercise could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **My doctor very much believes this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you feel you would be able to include a brief amount of exercise (e.g., a 15 minute walk) in to your daily routine?

Not at all able ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Fully able**

Keeping in mind that scientific evidence supports this self-help strategy, would you do some light physical exercise (e.g., 15-minute walk, jogging, dancing) 3 to 5 times a week over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this ○1 ○2 ○3 ○4 ○5 ○6 ○7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Light Therapy

Strategy #4: Light

Full-spectrum light (i.e., light from the sun or a "light therapy" lamp) can improve mood and functioning.

THE RESEARCH: One study placed 102 patients with non-seasonal depression into two groups. One group received one hour of bright light each morning for five weeks. The other group received one hour of low light each morning. The bright light group had significantly improved mood following the study.

HOW IT WORKS: Natural light and light from light-therapy works in two ways to improve mood. Firstly, it increases the amount of neurotransmitters (brain chemicals) associated with heightened mood (e.g., serotonin, dopamine). Secondly, when timed appropriately, every morning for example, light therapy helps sync your body's rhythm (circadian rhythm) with the your sleep-wake cycle.

WHO RECOMMENDS LIGHT THERAPY: The **Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) recommends light therapy for people who experience depression primarily in the winter months. The **American Psychiatric Association** recommends light therapy for seasonal as well as nonseasonal depression.

Get more sunlight or order a light therapy lamp using the University of British Columbia's Mood Disorder Centre's **suggestions**.

(**Sources**)

Please answer the following questions about light therapy as a strategy for improving your moods.

Keeping in mind that scientific evidence supports this self-help strategy, to what degree, do you believe that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

Not at all effective	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	**Very effective**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your significant other, family or friends believe that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

They don't believe this at all	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	**They very much believe this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your doctor believes that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	**My doctor very much believes this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you feel you would be able to add a brief amount of light therapy (e.g., 1 hour in the morning) to your daily routine?

Not at all able	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	**Fully able**

Keeping in mind that scientific evidence supports this self-help strategy, would you complete a session of some form of light therapy (1 hour in the morning) each day for the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	**I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Medication

Strategy #5 - Taking Prescribed Medication as Directed

If your physician has prescribed medication to help you manage your low mood, taking that medication regularly as directed can significantly improve your mood.

THE RESEARCH: In a study published in the Journal of the American Medical Association, it was discovered that the patients who took their antidepressant medication regularly were 25% more likely to feel that the medication is helping their mood than those who did not take their medication regularly. Seventy-five percent of individuals who took their medication regularly had a 50% or greater reduction in their depressive symptoms! Less than half of those who did not take their medication regularly had the increase in mood.

HOW IT WORKS: Some of the most common medications prescribed for low mood and depression require time for the drug to build up in the body before it has the desired effect. Taking medication regularly allows the drug to work the way it is intended. Following your doctor's directions for taking medication is important.

WHO RECOMMENDS TAKING MEDICATION AS DIRECTED: All professional healthcare organizations recommend taking medications as prescribed including the **Canadian Medical Association** and the **Canadian Psychiatric Association** (CPA, 2001).

Pill boxes have been shown to be helpful in reminding people to take their medication as prescribed. Visit your local **drug store** to pick one up.

(**Sources**)

Please answer the following questions about taking prescribed medication regularly as a strategy for improving your moods.

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you believe that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

Not at all effective ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Very effective**

Keeping in mind that scientific evidence supports this self-help strategy, to what

degree do you think that your significant other, friends or family believe that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

They don't believe this at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **They very much believe this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your doctor believes that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **My doctor very much believes this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you feel you would be able to take prescribed medication as directed?

Not at all able ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Fully able**

Keeping in mind that scientific evidence supports this self-help strategy, would you, over the next two to three weeks, consider taking prescribed medication as directed as a strategy to improve your mood?

I have no intention of doing this ○1 ○2 ○3 ○4 ○5 ○6 ○7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Psychotherapy

Strategy #6: Psychotherapy (Talk Therapy)

Psychotherapy or talk therapy is considered to be one of the most effective treatments for low mood or depression.

THE RESEARCH: Cognitive behaviour therapy (CBT) is widely considered to be a first-line, non-medication treatment for depression. In one study, 40 primary care patients with depression were randomly assigned to one of two groups. The first group received CBT from a qualified mental health professional in addition to care as usual from their physician. They second group simply received care as usual from their physician. In addition to showing a greater reduction in depressive symptoms, the patients that received CBT were also more likely to be without depression and medication free two years after finishing therapy. In fact, patients that did not complete CBT were four times more likely to relapse.

HOW IT WORKS: Through weekly 1-hour sessions with a qualified professional, CBT teaches skills that help one change their behaviour and the way they think. CBT has been shown to actually change the way parts of the brain work meaning the effects of CBT last long after therapy has finished.

WHO RECOMMENDS SEEKING PSYCHOTHERAPY: The **Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) recommends psychotherapy for depression as does the **Canadian Psychiatric Association** (CPA, 2001).

Use the College of Psychologists of Ontario **website** to find a therapist.

(**Sources**)

Please answer the following questions about learning more about psychotherapy as a strategy for improving your moods.

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you believe that psychotherapy could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your significant other, friends or family believe that

psychotherapy could be an effective strategy for improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your doctor believes that psychotherapy could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you feel you would be able to take part in psychotherapy with a qualified professional?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind that scientific evidence supports this self-help strategy, would you consider seeking psychotherapy services over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Social Support

Strategy #7: Being Social

Maintaining healthy relationships with friends and family and starting new relationships can be a great way to improve your mood.

THE RESEARCH: In a study of over 40,000 Norwegians, researchers found that regardless of age or gender, those individuals with greater social support had healthier moods. Social support in this study included emotional support or more tangible sources of support (e.g., help at home).

HOW IT WORKS: When our mood is low, some people isolate ourselves, remove themselves from the company of others. This only serves to worsen one's mood with feeling of loneliness or rejection. Going out with friends to do something fun, even if you don't feel like it, will boost your mood, which will help you to think more positively. Friends and family will also help encourage you and make you feel better about yourself.

WHO RECOMMENDS VISITING WITH FRIENDS: In their clinical practice guidelines for the treatment of depression, the **College of Family Physicians of Canada** (CFPC, 2007) and the **National Collaborating Centre for Mental Health - National Institute for Health and Clinical Excellence** (NICE, 2009) recommend increased social support and social activities to help improve mood.

With a friend you can go out for coffee, see a movie, just visit or check out some of the things that are happening in **Ottawa**.

(**Sources**)

Please answer the following questions about socializing more as a strategy for improving your moods.

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you believe socializing more could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your significant other, family or friends believe socializing

more could be an effective strategy for improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your doctor believes socializing more could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you feel you would be able to spend more time (30 minutes more) socializing each day this coming week?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind that scientific evidence supports this self-help strategy, would you consider socializing more over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Symptom Monitoring

Strategy #8: Symptom Monitoring

Monitoring and being aware of your depressive symptoms can actually help increase your mood.

THE RESEARCH: In a study of 386 depressed patients who were prescribed antidepressant medication by the physician, those that took part in a relapse prevention program that included routine monitoring of depressive symptoms saw a greater increase in mood than those who did not monitor symptoms. Those patients who monitored their symptoms were also more likely to follow their physician's directions for treatment.

HOW IT WORKS: Regularly monitoring your symptoms of low mood or depression helps you recognize when you have made improvements and helps you identify strategies or experiences that have helped improve your mood. Monitoring symptoms also helps you recognize when your mood is getting lower allowing you to intervene sooner.

WHO RECOMMENDS SYMPTOM MONITORING: The **National Institute for Health and Clinical Excellence** (NICE, 2009) recommends symptom monitoring in its latest clinical practice guidelines for the treatment of depression and low mood.

The What'sMyM3 **website** offers an easy way of monitoring your depressive (and possibly other) symptoms.

(**Sources**)

Please answer the following questions about symptom monitoring as a strategy for improving your moods.

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you believe that symptom monitoring could be an effective strategy for improving sad or depressed moods?

Not at all effective ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Very effective**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your significant other, family or friends believe that symptom monitoring could be an effective strategy for improving sad or depressed

moods?

They don't believe this at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **They very much believe this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you think that your doctor believes that symptom monitoring could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **My doctor very much believes this**

Keeping in mind that scientific evidence supports this self-help strategy, to what degree do you feel you would be able to monitor your symptoms?

Not at all able ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Fully able**

Keeping in mind that scientific evidence supports this self-help strategy, would you monitor your symptoms weekly, over the next two to three weeks, with this depressive symptom checklist. Click **here** to open a checklist as a PDF file, which you can then save and print each week?

I have no intention of doing this ○1 ○2 ○3 ○4 ○5 ○6 ○7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Pet Therapy

There are strategies that DO NOT work

While there are a number of self-help strategies that are effective in managing depression and sad mood, there are other strategies that ARE NOT effective in improving mood. These unhelpful strategies have been shown, through scientific research, to be of no to little benefit to those who have used them. Whether or not you are dealing with sad mood right now, we would like to know your opinions about the last strategy below. Please answer all of the questions below even if you feel a certain strategy does not currently apply to you.

PET THERAPY

Owning a pet or interacting with animals regularly has NOT been shown in scientific research to significantly improve mood.

THE RESEARCH: In a hospital setting, 58 patients with depression or low mood were each randomly assigned to one of two groups. The first group participated in five days of pet therapy. The second group participated in an unrelated program. Those who participated in pet therapy had NO CHANGE in their level of depressive symptoms. (Zisselman, Rovner, Shmuely, & Ferrie, 1996).

WHY IT DOESN'T WORK: It was thought that pets or interactions with animals offer some of the same benefits as human socializing; however, this is not the case. Animals do not offer the practical support that humans offer (for example, helping out with chores, providing transportation) and they do not offer the compassion and emotional understanding of humans.

NO RECOMMENDATIONS: The use of pet therapy is NOT recommended by the **Canadian Psychiatric Association** (CPA 2009), **The Canadian Network for Mood and Anxiety Treatment** (CANMAT, 2009) or any other professional body in Canada.

(Source)

Please answer the following questions about pet therapy as a strategy for improving your moods.

Keeping in mind that scientific evidence DOES NOT support this self-help strategy, to what degree do you believe that pet therapy could be an effective strategy for improving sad or depressed moods?

Not at all effective	1	2	3	4	5	6	7	**Very effective**

Keeping in mind that scientific evidence DOES NOT support this self-help strategy, to what degree do you think that your significant other, family or friends believe that pet therapy could be an effective strategy for improving sad or depressed moods?

They don't believe this at all	1	2	3	4	5	6	7	**They very much believe this**

Keeping in mind that scientific evidence DOES NOT support this self-help strategy, to what degree do you think that your doctor believes that pet therapy could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all	1	2	3	4	5	6	7	**My doctor very much believes this**

Keeping in mind that scientific evidence DOES NOT support this self-help strategy, to what degree do you feel you would be able to engage in pet therapy (e.g., spend more time with your pet or another animal) as part of your daily routine?

Not at all able	1	2	3	4	5	6	7	**Fully able**

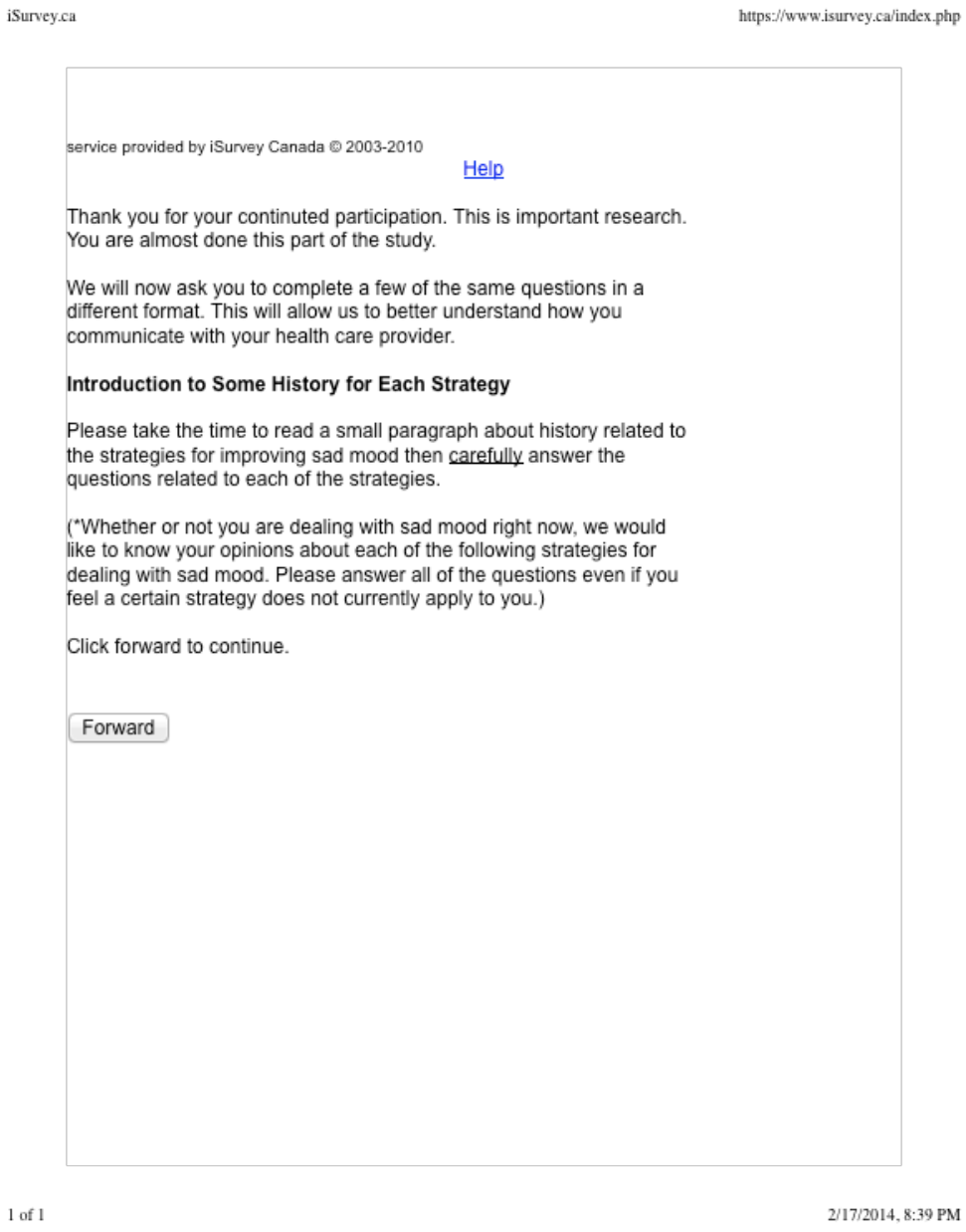
Keeping in mind that scientific evidence DOES NOT support this self-help strategy, would you engage in some pet therapy (e.g., spend more time with your pet or another animal) in your daily routine over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this	1	2	3	4	5	6	7	**I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Appendix H – Post-Intervention Theory of Planned Behavior Questions Control Group

Preamble



Psychoeducation

Strategy #1: Knowing more about Depression

SOME HISTORY: "The term depression was derived from the Latin verb deprimere, "to press down". From the 14th century, "to depress" meant to subjugate or to bring down in spirits. It was used in 1665 in English author Richard Baker's Chronicle to refer to someone having "a great depression of spirit", and by English author Samuel Johnson in a similar sense in 1753."

(Source)

Please answer the following questions about learning more about depression as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree do you believe that learning more about depression could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, friends or family believe that learning more about depression could be an effective strategy for improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes that learning more about depression could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to take a moment to learn more about depression?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you consider

learning more about low mood and depression over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Bibliotherapy

Strategy #2: Self-Help Books

SOME HISTORY: "Writing is the representation of language in a textual medium through the use of a set of signs or symbols (known as a writing system). It is distinguished from illustration, such as cave drawing and painting, and non-symbolic preservation of language via non-textual media, such as magnetic tape audio. Writing most likely began as a consequence of political expansion in ancient cultures, which needed reliable means for transmitting information, maintaining financial accounts, keeping historical records, and similar activities."

(Source)

Please answer the following questions about self-help books as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree, do you believe that self-help books could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, friends or family believe that reading a self-help book could be an effective strategy in improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes that reading a self-help book could be an effective strategy in improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to pick up (buy or borrow), read and apply a self-help book?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you read a self-help book as a strategy to improve your mood, within the next two to three weeks?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Exercise

Strategy #3: Excercise

SOME HISTORY: "The Ancient Olympic Games were athletic festivals held every four years at the sanctuary of Zeus in Olympia, Greece. Competition was among representatives of several city-states and kingdoms of Ancient Greece. These Games featured mainly athletic but also combat and chariot racing events. During the Games, all conflicts among the participating city-states were postponed until the Games were finished. This cessation of hostilities was known as the Olympic peace or truce."

(Source)

Please answer the following questions about physical exercise as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree do you believe that physical exercise could be an effective strategy for improving sad or depressed moods?

Not at all effective ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, family or friends believe that physical exercise could be an effective strategy for improving sad or depressed moods?

They don't believe this at all ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes that physical exercise could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to include a brief amount of exercise in to your daily routine?

Not at all able ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you do some light physical exercise 3 to 5 times a week over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Light Therapy

Strategy #4: Light

SOME HISTORY: "Historians Robert Friedel and Paul Israel list 22 inventors of incandescent lamps prior to Joseph Swan and Thomas Edison. They conclude that Edison's version was able to outstrip the others because of a combination of three factors: an effective incandescent material, a higher vacuum than others were able to achieve (by use of the Sprengel pump) and a high resistance that made power distribution from a centralized source economically viable."

(Source)

Please answer the following questions about light therapy as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree, do you believe that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, family or friends believe that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes that getting more light (from the sun or a "light therapy" lamp) could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to add a brief amount of light therapy to your daily routine?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you complete a session of some form of light therapy each day for the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Medication

Strategy #5 - Taking Prescribed Medication as Directed

SOME HISTORY: "Psychoactive drug use is a practice that dates to prehistoric times. There is archaeological evidence of the use of psychoactive substances (mostly plants) dating back at least 10,000 years, and historical evidence of cultural use over the past 5,000 years. The chewing of coca leaves, for example, was found to date back over 8000 years ago in Peruvian society."

(Source)

Please answer the following questions about taking prescribed medication regularly as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree do you believe that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, friends or family believe that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes that taking prescribed medication as directed could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to take prescribed medication as directed?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you, over the

next two to three weeks, consider taking prescribed medication as directed as a strategy to improve your mood?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Psychotherapy

Strategy #6: Psychotherapy (Talk Therapy)

SOME HISTORY: "Philosophers and physicians from these schools practised psychotherapy among the Greeks and Romans from about the late 4th century BC to the 4th century AD. Psychoanalysis was perhaps the first specific school of psychotherapy, developed by Sigmund Freud and others through the early 20th century. Trained as a neurologist, Freud began focusing on problems that appeared to have no discernible organic basis, and theorized that they had psychological causes originating in childhood experiences and the unconscious mind. Techniques such as dream interpretation, free association, transference and analysis of the id, ego and superego were developed."

(Source)

Please answer the following questions about learning more about psychotherapy as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree do you believe that psychotherapy could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, friends or family believe that psychotherapy could be an effective strategy for improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes that psychotherapy could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to take part in psychotherapy with a qualified professional?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you consider seeking psychotherapy services over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Socializing

Strategy #7: Being Social

SOME HISTORY: "Friendship was a topic of moral philosophy in which was greatly discussed by Plato, Aristotle, and Stoics. This was less discussed in the modern era, until the re-emergence of contextualist and feminist approaches to ethics. Openness in friendship was seen as an enlargement of the self; Aristotle wrote, "The excellent person is related to his friend in the same way as he is related to himself, since a friend is another self; and therefore, just as his own being is choiceworthy him, the friend's being is choice-worthy for him in the same or a similar way." In Ancient Greek, the same word was used for "friend" and "lover"."

(Source)

Please answer the following questions about socializing more as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree do you believe socializing more could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, family or friends believe socializing more could be an effective strategy for improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes socializing more could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to spend more time socializing each day this coming week?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you consider socializing more over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Symptom Monitoring

Strategy #8: Symptom Monitoring

SOME HISTORY: "The study of psychology in a philosophical context dates back to the ancient civilizations of Egypt, Greece, China, India, and Persia. Historians point to the writings of ancient Greek philosophers, such as Thales, Plato, and Aristotle (especially in his De Anima treatise), as the first significant body of work in the West to be rich in psychological thought. As early as the 4th century BC, Greek physician Hippocrates theorized that mental disorders were of a physical, rather than divine, nature."

(Source)

Please answer the following questions about symptom monitoring as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree do you believe that symptom monitoring could be an effective strategy for improving sad or depressed moods?

Not at all effective ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, family or friends believe that symptom monitoring could be an effective strategy for improving sad or depressed moods?

They don't believe this at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes that symptom monitoring could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all ○1 ○2 ○3 ○4 ○5 ○6 ○7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to monitor your symptoms?

Not at all able ○1 ○2 ○3 ○4 ○5 ○6 ○7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you monitor your symptoms weekly, over the next two to three weeks, with this depressive symptom checklist?

I have no intention of doing this ○1 ○2 ○3 ○4 ○5 ○6 ○7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Pet Therapy

Strategy #9: PET THERAPY

SOME HISTORY: "The present lineage of dogs was domesticated from gray wolves about 15,000 years ago. Though remains of domesticated dogs have been found in Siberia and Belgium from about 33,000 years ago, none of those lineages seem to have survived the Last Glacial Maximum. Although DNA testing suggests an evolutionary split between dogs and wolves around 100,000 years ago, no fossil specimens prior to 33,000 years ago are clearly morphologically domesticated dog."

(Source)

Please answer the following questions about pet therapy as a strategy for improving your moods.

Keeping in mind the history related to this self-help strategy, to what degree do you believe that pet therapy could be an effective strategy for improving sad or depressed moods?

Not at all effective 1 2 3 4 5 6 7 **Very effective**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your significant other, family or friends believe that pet therapy could be an effective strategy for improving sad or depressed moods?

They don't believe this at all 1 2 3 4 5 6 7 **They very much believe this**

Keeping in mind the history related to this self-help strategy, to what degree do you think that your doctor believes that pet therapy could be an effective strategy for improving sad or depressed moods?

My doctor doesn't believe this at all 1 2 3 4 5 6 7 **My doctor very much believes this**

Keeping in mind the history related to this self-help strategy, to what degree do you feel you would be able to engage in pet therapy as part of your daily routine?

Not at all able 1 2 3 4 5 6 7 **Fully able**

Keeping in mind the history related to this self-help strategy, would you engage in some pet therapy in your daily routine over the next two to three weeks as a strategy to improve your mood?

I have no intention of doing this 1 2 3 4 5 6 7 **I will try this in the next 2 to 3 weeks**

If you have little or no intention of doing this, what is the reason for not doing this (e.g., not depressed, physcially unable to do this, do not think it will be beneficial, or just do not want to, etc.)?

Forward

Appendix I – Student Advertisement

Sad? Depressed? Low Mood? Stressed? You may be eligible to participate in the University of Ottawa's Optimizing Outcomes study. This study will investigate how you and your doctor communicate, and how this is related to your care. Your participation in this study is voluntary. Participants must be fluent in English. If you agree to participate, you will be asked to complete two questionnaires, one initially and one in two-week's time, each taking approximately 15 minutes. To thank you for your time you will be given one ISPR credit. Please visit the following website for more information about the study and to register to participate: www.OptimizingOutcomes.net The ethical aspects of this study have been sanctioned by the University of Ottawa Social Sciences and Humanities Research Ethics Board.

Triste? Déprimé? Mauvaise humeur? Stressé? Vous pourriez qualifier pour participer à l'étude de l'Optimisation des Résultats, à l'Université d'Ottawa. Cette étude examinera comment vous et votre docteur communiquez, et comment cela influence vos soins. Votre participation dans cette étude est volontaire. Les participants doivent pouvoir communiquer en anglais. Si vous acceptez de participer, vous serez demandé de remplir deux questionnaires, l'un au début et l'autre à deux semaine de temps, chacun prenant environ 15 minutes. Pour vous remercier de votre temps, les participants recevra le crédit SIPR. Veuillez s'il-vous-plaît visiter le site web suivant pour plus d'information au sujet de l'étude et comment y participer: www.OptimizingOutcomes.net Les aspects d'éthiques portant à cette étude ont été sanctionnés par le bureau d'éthique et d'intégrité de la recherche des sciences sociales de l'Université d'Ottawa.

Appendix J – Kijiji Advertisement

Subject Line: Participants Needed for uOttawa Study! (uOttawa and BestBuy logos as picture).

Sad? Depressed? Low Mood? Stressed?

If you are 18 years of age or older, you are eligible to participate in the University of Ottawa's **Optimizing Outcomes** study. This online study will investigate how you and your doctor communicate, and how this is related to your care.

Your participation in this study is voluntary.
Participants must be fluent in English.

To thank you for your time, you will be entered in a draw to win a $250 Gift Certificate from Best Buy Canada.

Please visit the following website for more information about the study and to register to participate: www.OptimizingOutcomes.com

The ethical aspects of this study have been sanctioned by the
University of Ottawa Social Sciences and Humanities Research Ethics Board
(Ethics File #09-10-20)

(Subject line same as English due to space)

Triste? Déprimé? Mauvaise humeur? Stressé?

Si vous avez 18-ans, vous êtes eligible pour participer à l'étude de l'Optimisation des Résultats, à l'Université d'Ottawa. Cette étude examinera comment vous et votre docteur communiquez, et comment cela influence vos soins.

Votre participation dans cette étude est volontaire. Les participants doivent pouvoir communiquer en anglais.

Pour vous remercier de votre temps, les participants seront inclus dans un tirage pour gagner un certificat-cadeau de 250$ à Best Buy Canada.

Veuillez s'il-vous-plaît visiter le site web suivant pour plus d'information au sujet de l'étude et comment y participer.
www.OptimizingOutcomes.com

Les aspects d'éthiques portant à cette étude ont été sanctionnés par le bureau d'éthique et d'intégrité de la recherche des sciences sociales de l'Université d'Ottawa.
(Ethics File #09-10-20)

Appendix K – Primary Care Patient Advertisement

Optimizing Outcomes
Self-Management Resources

Hello.

Your physician has indicated that you are eligible to participate in the **University of Ottawa's Optimizing Outcomes** study. This study will investigate how you and your doctor communicate and how this is related to your care.

Your participation in this study is voluntary. Participants must be fluent in English.

To thank you for your time, you will be entered in a draw to win a $250.00 Gift Certificate from Best Buy Canada.

Please visit the following website for more information about the study and to register to participate: www.optimizingoutcomes.net

Thank you.

uOttawa
L'Université canadienne
Canada's university

This study has been approved by the University of Ottawa's Social Sciences and Humanities Research Ethics Board (File #09-10-20)