The Association of the Social Relationships CAP with Depression in Psychiatric In-patients: An Outcome Study

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

ABSTRACT

Background: Depression is a worldwide problem but studies have shown that after patients with depressive symptoms are in remission, difficulties in social relationships may persist. There is a need for future research on the relationship between social function and depressive symptoms in order to facilitate development of new clinical interventions.

Objectives: This study aimed to identify what factors contribute to the relationship between depressive symptoms and social relationships and what factors predict improvement in depressive symptoms during psychiatric hospitalization.

Methods: This longitudinal cohort study was based on a secondary analysis of RAI-MH data from the Ontario Mental Health Reporting System (OMHRS). Depressive symptoms were measured with the Depressive Symptoms Rating Scale (DRS) and social relationships difficulties were evaluated with the interRAI Social Relationships CAP. The sample comprised of 125,120 patients from acute, long stay, addiction, psychiatric crisis units and forensic units. Sub-sample of patients with depressive symptoms and mood disorder was created (N = 38,823). Results presented in a descriptive analysis for both samples and bivariate and multivariate analysis for the sub-sample. Logistic regression analysis was performed to predict rates of improvement of depressive symptoms.

Results: The study revealed that many factors predict outcome of depressive symptoms. Difficulties in social relationships, older age, multi-morbidity, functional impairments, trauma, and poor physical health predict decreased odds of improvements but longer hospital stay, individual therapy and family/couples therapy predict increased odds of improvements.

Conclusions: The interRAI Social Relationships CAP provides a valuable tool to address social

issues in patient care, assist clinical staff in care planning and provide mental health authorities

information for policy making.

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# 1.	Introduction and Overview

Depression is a global problem with many consequences for the person, his/her family and the community. Depressive symptoms are well known and studied extensively, but less is known about the relationship between social relationships and depressive symptoms. Social relationships are an important part of a person's quality of life. There has been a debate about whether a deficit in social function causes depressive symptoms or depressive symptoms problems in social functioning. For the purpose of this study the focus will be on how social relationships or lack of them affects depressive symptoms and to identify what factors contribute to their relationship. In addition, the aim is to explore if social relationships predicts improvement in depressive symptoms after adjusting for other risk factors.

Studies have shown that even after patients with depressive symptoms are in remission, difficulties in social relationships may continue to be a problem (Kennedy et, al., 2003; Kennedy et al., 2004; Kennedy et al., 2007; Kennedy and Paykel, 2004; Skärsäter, 2005). However, there is a great need for future research on the relationship between social function and depressive symptoms in order to facilitate the development of new clinical interventions to address this problem.

This study will use data based on the RAI-MH, a new comprehensive assessment system that has been mandated for all Ontario psychiatric hospitals/units. The depressive symptoms will be measured with Depressive Symptoms Rating Scale (DRS) (www.interrai.org, 2010). The RAI-MH is one of eleven interRAI suites instruments designed to assess the strengths, preferences, and needs of vulnerable patients. These instruments offer the opportunity for

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integrated multi-domain assessment, enabling electronic clinical records, data transfer, ease of interpretation and streamline training (Gray et al., 2009).

       Specific interventions to improve social relationships are not well studied and special clinical guidelines which address social relationships in depression have been difficult to find. Hopefully this study will contribute to fill this gap in knowledge.

2. Literature review

A review of the literature was conducted to determine the prevalence rates, predictors, measurement, interventions, outcomes of depressive symptoms relations, and the relationship between social function and depressive symptoms in psychiatric in-patients. Medline Ovid, PubMed, Google scholar and CINHAL databases were searched, and emphasis was placed on selection of peer-reviewed research and review articles from 1990 - 2010 were selected in addition to several selected earlier studies. For the purposes of this review the keywords used in the search were: Social relationships, social function, social support, social skills, mental health, depression and depressive symptoms. The term social relationships, social function and social skills will be used interchangeably as in the literature.

2.1 Depression

2.1.1 Depression worldwide

Approximately 450 million people are affected by mental and behavioural disorders worldwide (WHO, 2004). Psychiatric conditions account for 13 % of total Disability Adjusted Life Years (DALYs) lost due to disease and injury in the world and are estimated to increase to 15% by the year 2020. Five of ten leading causes of disability and premature death worldwide are because of psychiatric diseases. Depression is common worldwide, affecting about 121 million people; however fewer than 25% of those affected have access to effective treatment. Depressions leads to 850,000 suicides per year (WHO, 2007a; WHO 2003). The lifetime risk for any type of

depressions is 7% - 13% for men and 20% - 30% for women, and the female-male ratio averages 2:1. This sex difference holds across cultures and continents (Bracke, 1998; Patten et al., 2006; Stuart and Sundeen, 1994, WHO, 2004). The risk of depression increases with higher age (Patten et al., 2006). According to the Burden of Illness study, depression will be the second leading causes of disability worldwide by 2020 following heart disease (Garcia-Cebrian et al., 2008; Neumeyer-Grome, 2004; WHO, 2007a). Depression is a recurrent disorder where 50% - 85% of patients that have an episode of depression will have another episode (Inoue et al., 2006). However, no reliable methods to predict recurrence have been established. Hence, depression is a serious health problem that deserves attention and action.

2.1.2   Depression in Canada

Canadian studies examining lifetime incidence of major depressions found that 7.9% to 12% of adults over 18 years of age and living in the community met the criteria for a diagnosis of major depression at some point in their life (Canadian Psychiatric Association (CPA), 2001; Patten et al., 2006). These findings are similar to the findings of prevalence of depressions in other countries (Paykel et al., 2005; Riolo et al., 2005). The factors increasing the risk of major depression prevalence based on the Canadian Community Health Survey (CCHS) were female sex, age, marital status, chronic medical conditions, employment and income.

The National Population Health Survey (NPHS) is a longitudinal study conducted by Statistics Canada. A national representative sample was followed for 2 years, excluding those who had a diagnosis of a major depression. In this sample 11,859 subjects were identified as experiencing major depression after a follow-up interview. The annual incidence for men was

highest for those in the age group 25-44 year old or 3.3 per 1000 persons (95% CI 1.4-4.3) and

highest for women aged 12-24 or 7.1 per 1000 persons (95% CI 5.1 - 9.1) (Patten, 2000).

Table 1   Age and sex-specific estimates of major depressions

Age (years)	12 mo period prevalence in 1994/95	Annual incidence proportion per 1000 in 1996/97 (and 95% CI)*, %
Men		
12 - 24	5.2	2.9 (1.4 - 4.3)
25 - 44	3.5	3.3 (2.0 - 4.7)
65+	-	1.8 (0.7 - 2.9)
Women		
12 - 24	9.6	7.1 (5.1 - 9.1)
25 - 44	8.6	4.5 (3.4 - 5.7)
45 - 64	6.3	4.1 (2.5 - 5.7)
65+	3.1†	3.1 (0.6 - 2.1)

*the National Population Health Survey
CI= Confidence Interval
† Subject to high variability

2.1.3   Impact of depression

Depression affects individuals of all ages, but its symptoms usually begin to appear in

adolescence or young adulthood. In Canada, the range of first diagnosis of a major depressive

disorder is between the early twenties to early thirties.

Those with a major depression are at an increased risk of suicide, have lower

employment rates, higher absentees, and have lower quality of life than the general population

Canadian Psychiatric Association, 2001; Papakostas et al., 2003; Crawford, 2004; Garcia-

Cebrian et al., 2008; Greer et al., 2010). Depressed employees are more than twice likely to be

absent from work and failure to attain full remission of depression is associated with a lower likelihood of maintaining paid employment and more missed days from work (Greer et al., 2010; McIntyre et al., 2006). The monetary costs of depression including the cost of treatment and indirect cost of lost workdays and lost productivity are substantial.

Major depression is ranked as the forth cause of disability and premature death worldwide (WHO, 2007a). Major depression can have impact on all aspects of the individual's life (e.g., the family life, social relationships, employment, education, and social-economic status). Depression also has a major impact on family and other caregivers often resulting symptoms of depressions and anxiety in the family or caregivers (Hirschfeld et al., 2000).

The impact of depression extends beyond the depressive symptoms and affects the individual's quality of life, including the ability to function socially, maintain and enjoy relationships, and work. The burden of major depressions on the individual, families, and community makes major depressions one of the major health care problems to be addressed in the 21st century. Major depression deserves attention that will prevent it, where possible, improve knowledge and awareness, and minimize its negative impact on quality of life.

2.1.4   Symptoms of depression

There are two major disease classification system used presently: ICD-10 and DSM-IV. The ICD-10 classification system will be used here because it is universally recognized and not specific to the mental health field as is DSM-IV.

There are 3 major types of mood disorders: depression, bipolar and dysthymia. ICD-10 classifies depression into six types (WHO, 2007b):

F33 Recurrent Depressive Disorder

F32 Depressive Episodes

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F32.0 Mild Depressive Episode

F32.1 Moderate Depressive Episode

F32.2 Severe Depressive Episode Without Psychotic Symptoms

F32.3 Severe Depressive Episode With Psychotic Symptoms

A depressive episode may be specified as mild, moderate or severe. Depending upon the number and severity of the symptoms The general symptoms of depression are according to ICD - 10: lowering of mood, reduction of energy, decrease in activity, lowering in capacity for enjoyment (anhedonia), lowering in interest of previous interest, reduced concentration ability, marked tiredness after even minimum effort, disturbed sleep, diminished appetite, reduced self-esteem and self-confidence reduced, ideas of guilt or worthlessness, little day to day variation in lowering mood, unresponsive to circumstances, somatic symptoms (e.g. repetitive health complaints), waking in the morning several hours before the usual time, depressive symptoms are often worst in the morning, marked psychomotor retardation (reduced body movements), agitation, loss of libido, and suicidal thoughts and acts.

There are about 20 depressive symptoms described by ICD-10. If depression is deconstructed it includes symptoms of dysphoria, anxiety, anhedonia (lack of general pleasure in life), and suicidality (Levine et al., 2001; Stones & Kirkpatrick, 2003).

2.1.5   Specific clinical measurement of depression

There are abundant depression measurement scales such as Center for Epidemiological Studies CES-D, Beck Depression Inventory, Cornell Depression Scale, Hamilton Depression Rating Scale, Geriatric Depression Scale. For the purpose of this study the interRAI-MH Depression

Rating Scale (DRS) will be used. The DRS is an outcome scale, consists of seven items embedded in all assessment instruments of the RAI/MDS series of instruments (see appendix). These items are: 1) Negative statements, 2) persistent anger, 3) expressions of unrealistic fears, 4) repetitive health complaints, 5) repetitive anxious complaints 6) sad, worried facial expression, and 7) tearfulness (Hirdes, 2003; Burrows, 2000; Martin et al., 2008). The scale has been shown to be both reliable and valid (Burrows, 2000) and it was validated against the Hamilton Depression Rating Scale. The maximum score of the DRS is 14 and score of 3 or more is considered an indicator of depression (Burrows, 2000).

Several articles have been published on the Depression Rating Scale for different populations, mostly population in nursing homes (Achterberg et al., 2006; Achterberg et al. 2003; Burrows et al., 2000; Kohler et al., 2005). DRS have also been used in studies on patients with advanced illness (Gruneir et al., 2005), patients receiving complex continuing care (Martin et al., 2007a), and individuals with intellectual disability (Martin et al., 2007c). Hirdes et al. (2002) reported on the convergent validity of the DRS in a sample of psychiatric patients.

2.1.6   Interventions

Interventions for major depression are numerous. For the purpose of this review, the focus will be on the most common interventions according to clinical practice guidelines (American Psychiatric Association (APA), 2000; Canadian Psychiatric Association (CPA), 2001). An abundance of clinical practice guidelines exist on how to manage depressive disorder. Guidelines are only considered valid for 5 year after publication or after revision, but seven guidelines were found to be published in 2005 till 2010 (Dansk Sundhedsstyrelsen, 2007; GPAC,

2007; New Zealand Guideline Group, 2008; NICE, 2009; SIGN, 2009; SIGN, 2010; UMHS, 2008).

Generally depression management is divided into 4 phases: Acute, Continuation, Maintenance, and Discontinuation of active treatment (APA, 2000, CPA, 2001). Medication is the most common intervention for major depression in the acute phase. There has been significant change in this area with the appearance of the Selective Serotonin Reuptake Inhibitors (SSRIs) in the last 25 years. Although there are benefits of the SSRI antidepressants over the older tricycles and MAOIs, studies continue to show that medication alone does not help in major depression (Kennedy et al., 2003).

Non-medication treatment modalities most likely to be utilized are: individual therapy, group therapy, family therapy, couple therapy, and self help groups. One patient may be involved all these modalities versus another who is not receiving any of these. Clinical practice guidelines recommend that, in the acute phase, the patient should receive antidepressant medication and psychotherapy (e.g. Cognitive behavioural therapy, interpersonal therapy), and/or electroconvulsive therapy (ECT). There is strong evidence that Electric Convulsive Therapy (ECT) should be considered for patients with a major depressive disorder with a high degree of symptom severity and functional impairments or for those cases in which psychotic symptoms or catatonia are present (APA, 2000).

For the continuation phase, there is strong evidence that, 16-20 weeks following remission, the patient who has been treated with antidepressants in the acute phase should be maintained on these agents to prevent relapse. Even though there has been less research on the utility of psychotherapy in the continuation phase, there is growing evidence to support the use of specific effective psychotherapy during this stage. Use of ECT in the continuation phase has

received little formal study, but may be useful for those in patients where medication or psychotherapy has not been effective.

In the maintenance phase, the treatment that was effective in the acute and continuation phase should been continued. The risk factors for recurrence of major depressive symptoms are: prior history of multiple episodes of major depression, persistence of dysthymic symptoms after recovery, presence of an additional non-affective psychiatric diagnosis, and presence of chronic general medical disorder (APA, 2000, McIntyre et al., 2006).

2.1.7   Outcomes of depression

There is an emerging consensus regarding a definition for remission in major depression and the goal of therapy must be to return to wellness and not only the absence of the depressive symptoms (McIntyre et al., 2006).

Disease management programs (DMP) includes multiple components such as evidence - based clinical practice guidelines and is defined as intervention to manage and to prevent disease by using systematic approach (Badamgarav et al., 2003). The effectiveness of non-pharmaceutical disease management programmes for major depression has rarely been demonstrated in rigorously designed evaluations. Only a few descriptions of disease management programs (DMP) with the goal of the improving care for patients with depression have been published (Badamgarav et al., 2003).

A growing numbers of studies have found numerous positive outcomes across multiple trials. Antidepressant medication and brief structured forms of psychotherapy are effective for 60-80% of those with depression and can be delivered in primary care (WHO, 2007a).

Lieberman et al. (1998) studied three cohorts of 206 patients with depression. Patients that were discharged earlier in comparison to previous discharge practice patterns show significantly higher levels of depressive symptoms and lower levels of global functioning on discharge, which may place them at greater risk for adverse outcomes in the immediate post hospital period. Due to shorter length of stay in psychiatric settings, patients are now discharged more depressed than they were before (Lieberman et al., 1998). One month after discharge, global and work functioning remained lower among the shorter stay group. While it is true that significant improvement can occur during hospital stay, patients are now more depressed and more globally impaired when they leave the hospital (Lieberman et al., 1998).

Kennedy et al. (2003) followed 70 patients with severe recurrent depression for 8-11 years. Although 92% of the 65 subjects recovered during follow-up, two thirds suffered a recurrence at some time. However, social function at follow-up was good probably due to high levels of pharmacological and psychological treatment. Kennedy et al. (2003) found that that greater severity of illness with higher number of depressive episodes was the best predictor of a poor outcome.

Long term outcome studies continue to show high recurrence rates for depressive symptoms (Kennedy et al., 2003; Kanai, 2003; Kennedy et al., 2004; Judd; 2000; Bosworth et al., 2002; Miller, 1998). This does not appear to have changed in the last 20 years, even after the development of the SSRIs in the mid 1980' (Kennedy et al., 2003).

Badamgarav et al. (2003) did an extensive systematic literature review on the effectiveness of disease management programs in depression in out-patient settings. Their review included a model by Wagner et al. (1996) to improve patient care for mental chronic illnesses with the following components: use of evidence-based practiced guidelines, practice

reorganization to meet the needs of chronically ill patients, patient education, and expert systems or multidisciplinary approaches to care.

von Kurff and colleagues (2003) evaluated the effects of a depression relapse prevention program on disability outcomes in primary care. A sample of 386 patients was randomly assigned into two groups: 194 patients were assigned to receive a relapse prevention program and the other half to a usual treatment group. All patients in the sample received pharmacological intervention. Both groups showed improvement over the study time period, but those receiving the relapse prevention program showed a significant intervention impact on social function as measured by SF-36 Social Function Scale. A limitation to this study is that the participating patients only had moderate levels of depression (patients with major depression were not eligible for this study). Thus, the results may not apply to in-patients with major depressive disorder.

McCraken et al. (2006) studied health services used by adults with depression in 5 European countries. The sample consisted of 14,387 people of whom 427 persons of age 18-65 had depressive disorder. In this study severity of depression, perceived health status, social functioning and level of social support were significant predictors of use of mental health service use.

Neumeyer-Gromer et al. (2004) did a systematic review and meta-analysis of randomized controlled trials on disease management programs for depression. Ten studies met the criteria for inclusion in the meta-analysis. Neumeyer-Gromer et al. (2004) concluded that complete disease management programs significantly improve depression outcomes based on the highest level of evidence of high quality studies.

The most frequently used outcome measure in antidepressant clinical trials is response to treatment, arbitrarily defined as a $\geq 50\%$ reduction of total symptoms severity (McIntyre, 2006).

An inverse and gradient relationship exists between depressive symptom and functionality (Judd, 2000). McIntyre (2006) described the consequences of not achieving remission of depression: symptomatic relapse/recurrence and chronicity, increased comorbidity, increased suicidal behaviour, increased functional impairment, increased medical service utilization, increased disability benefits and public assistance, and decreased quality of life.

At the present time, research involving persons that have been hospitalized provides the best available data on persons with depression. However, the results of these studies should be interpreted with caution since they only describe the subset of individuals with mood disorders who are hospitalized. Thus, they do not apply those who are treated in the community or have not received treatment at all.

Manber et al. (2008) studied sample of 681 subjects with chronic depression for 12 weeks. The sample was randomly assigned to three different interventions: antidepressants, psychotherapy and a combination of both. The combined intervention of antidepressants and psychotherapy produced full remission more rapidly than either of the single modality interventions.

There are few studies on predictors of remission in general and virtual absence of studies on predictors in chronic depression. Manber and colleagues (2008) explored numbers of potential predictors of remission in chronic depression including treatment modality, demographics, clinical features, early childhood adversity, psychological variables, and social functioning. The major predictor of remission was combination treatment. Time to remission is rarely reported as an outcome. Large scale studies have found superior outcome with combined treatments, particularly for more severe or more difficult to treat form of depression Manber et al., 2008).

2.2   Social function and social relationships

Psychosocial functioning plays an important and fundamental role in psychopathological conceptualization in depression. Psychiatric disorders are often strongly associated with impaired social functioning and these social deficits often persist after symptomatic recovery (Greer et al., 2010; Hirschfeld at al., 2000). Impairments in social functioning affect not only the individual, but also interpersonal relationships in both family and work environment. Studies have shown better quality of life and better clinical outcomes among employed patients, which underscore the influence of social functioning on outcomes of psychosocial treatments (Crips, 2005).

Numerous long-term studies of depression in psychiatric settings have shown poor long-term clinical outcomes, but little emphasis has been placed on psychosocial or functional outcomes (Kennedy et al., 2003). Future outcome studies need to focus on social functioning in depressed patients longitudinally.

The literature review did not reveal prevalence rates on impairments in social functioning. Nevertheless, studies on quality of life (QoL) include social functioning as one domain of QoL (Ritsner et al., 2000; Hirschfeld at al., 2000, Yager and Ehmann, 2006). Such studies have shown that patients with severe mental disorder are less satisfied with all aspects of their life than members of the general population.

Ritsner et al. (2000) compared quality of life between of 210 patients with severe mental disorders with 175 non-patients. The social domains between groups Ritsner et al. (2000) measured were: leisure time activities, social relationships and general activities. In all QoL domains, mental health patients were less satisfied than non-patient controls. Patients with

schizophrenia reported less satisfaction with social relationships compared with schizoaffective and/or mood disorders. When compared to controls, patients with severe psychiatric illnesses (schizophrenia, schizoaffective or mood disorders) had significantly (p< .001) lower QoL scores than the control group.

As stated before, depressive disorders are frequently associated with significant and pervasive impairments in social functioning and disturbed social relationships, often substantially worse than those experienced by patients with other chronic somatic medical conditions (Hirchfeld et al., 2000). Not all treatments are equally effective in relieving the impaired social relationships associated with depressive disorders. Moreover, the efficacy in relieving the core symptoms of depression does not necessarily guarantee it will relieve impairments in social functioning. Particular symptoms of depression such as loss of self-esteem and loss of interest in activities compromise central components of quality of life and social relationships.

2.2.1   Definitions

To date there has been no universal, standardized and widely accepted definition of social functioning (Hirschfeld at al. 2000; Ro and Clark, 2009; Yager and Ehmann, 2000; Tse and Bond, 2004). Paykel and Weissman, (1973), were the first researchers to draw attention to the association between social impairment and depression 30 years ago. They described social functioning as an individual's ability to function within their usual environment. Social functioning implies overall performance across many everyday social domains such as, interpersonal relationships, independent living, employment, and recreation.

Social relationships, social function, social skills, social support, social networks, social integration and social capital are all highly intertwined concepts that all relate to the ability of the individual to relate with others in social context. For the purpose of this thesis the author will focus on social relationships and social function as key concepts.

Social skills are learned behaviours that are both situation-specific and context-dependent. Social skills refer to the cognitive, verbal, and nonverbal behaviours necessary to engage in positive interpersonal interactions. Social skills are also defined as the ability to achieve the objectives that the person has for interacting with others (Beauchamp and Andersen, 2010: Yager and Ehmann, 2006).

Tse and Bond (2004) described three important components of socially skilled behaviours: perceptual, cognitive, and performance. "The perceptual component concerns the process involved in the selection of information. The cognitive component assists in the interpretation of the information of the selected information and the generation of choices and of behavioural responses. The performance component is the act of performing the chosen behaviour. Social skill deficits observed in depressed patients could be the outcome of impairment in all these three components" (Tse and Bond, 2004 pp. 261).

Social support refer to the resources provided by other persons to the individual and can protect persons from becoming depressed (Peirce et al., 2000). A social network is a social structure (generally individuals or organizations) that is tied by one or more specific types of relations, such as values, visions, idea, financial exchange, friends, and kinship (Peirce et al., 2000). It has been argued that social networks provide emotional support and instrumental aid that can play a major role maintaining an individual's mental health (Cohen, 2004; Whitley et al., 2005).

Social functioning as a concept differs from the concepts of social skills, social support, and social network, by how the individual uses his/her social resources, and relates to others in his/her environment forming social relationships.

2.2.2   Measurement of social function and social relationships

Social functioning is one of the key features of quality of life and there are numerous scales reported to measure social functioning both globally and within specific domains (Elgie and Morselli, 2009: Greer et al., 2010; Hirschfeld at al.; 2000, McKnight and Kashdan, 2009; Ro and Clark, 2009; Yager and Ehmann, 2006). Most social function scales where developed in the last 20 years compare with depression scales were developed 40 years or more ago, that influences use in researches and less literature (McKnight and Kashdan, 2009). Examples of social scales commonly used in clinical treatment for depressive symptoms include: 1) Social Adjustment Scale Self-Report (SAS-SR), 2) the 36 item Short-Form Health Survey (SF-36), 3) the Sheehan Disability Scale, and 4) the Social Adaptation Self-evaluation Scale (SASS), 5) Rosenberg Self Esteem Scale (Rosenberg SES), 6) Social Functioning Questionnaire (SFQ), 7)WHO Disability Assessment Schedule II (WHODAS-ii), and 8) WHO Quality of Life-BREF (WHOQOL-BREF). The majority of those scales are self-administrated questionnaires. Other scales measure general disability, quality of life and overall functioning that includes social functioning, but do not focus entirely on that domain (Hansson and Bjorkman, 2007). When measuring social functioning it is recommended that the one uses a multi-method approach in which data are collected from multiple sources (e.g. client, relatives, clinician) and at multiple levels of analysis (e.g., general social functioning, social perception, social information processing, and social sending skills). Simple validated cross-sectional self-report scales and

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observer report scales can be used to measure dimensions of social functioning in routine clinical practice and research.

Greer et al. (2010) review the literature on functional impairments in depression and tools commonly used to assess them. They recommended that evaluation of functional outcomes in depression should include: i) to adequately assess functional impairment; ii) indentify and/or develop treatment plans to target symptoms of functional impairments; and iii) monitor functional impairments throughout the course of illness. Functional outcomes are essential to understand patients' response to treatment. Assessing patients' functional status and functional recovery (ability to enjoy interpersonal relationships, to work and overall quality of life) along with symptomalogy may provide clearer picture of effectiveness of interventions (Greer et al., 2010).

Most long-term outcome studies to date have not used any standardized scale for the assessment of functional outcome or have used self-reporting scales which may be biased by the mood or personality traits of the subject (Kennedy et al., 2007).

2.2.3   The relationship between social function, social relationships and depression

Researchers have not been in agreement of what comes first, deficits in social function or depression (Segrin, 2000). Three different theoretical relationships between disrupted social skills and depression are described and evaluated: a) poor social skills as a cause of depression; b) depression as a cause of poor social skills; and c) poor social skills as a vulnerability factor in the development of depression (Segrin, 2000).

Some evidence shows that the relationship between social skill deficits and depression is strong and that depression may exert a negative influence on social skills. However, most studies

were conducted before 2000 and therefore there is a need for more recent studies to confirm this relationship between social function and depression since pharmacological and psychosocial intervention continues to change over time (APA, 2001).

There is evidence that social skills deficits are a manifestation of state depressive factors. For example it has been found that these factors are in fact state markers of a depressive episode, rather than an underlying vulnerability factor (Tse and Bond, 2004). Anhedonia (lack of pleasure or enjoyment in life) could be viewed as not being willing to participate or it may be perceived as impoliteness (Bouhuys and van den Hoffdakker, 1993).

Self focused attention is more commonly found in depressed patients and restrictive cognitive abilities make them vulnerable to negative perceptual bias since they tend to view the world more negatively than non depressed persons. They also tend to feel rejected and therefore avoid social interaction (Marcus and Askari, 1999).

Social skills deficits are common among depressed patients, but less attention has been paid to this aspect of depression comparing to studies on clinical symptoms of depression (Elgie and Morselli, 2009; Greer et al., 2010; Tse and Bond, 2004). Many studies have shown that depression has a direct negative effect on social skills and social function. On the other hand, social skill deficits have shown no significant influence on depression (Greer et al., 2010; Tse and Bond, 2004).

Social skill deficits in depressed patients have strong influence on their social behaviour and may affect their social relationships. Factors common to depression that can effect social relationships include, self focused attention, negative cognition, self-verification, reassurance-seeking behaviour, and anhedonia, each of which have a role in influencing negative social skills. This in turn can lead to social rejection and problems in social functioning.

Less is known about the impact of depressive disorder, after recovery from the acute episode, on the lifestyle, social relationships and social functioning during the maintenance and/or normalization phases. In the literature, the term "lingering" or "lagging effect" is used to describe some features of the person's social functioning/social adjustment after recovery from the acute episode of depression (Elgie and Morselli, 2009). Those lingering effects can be loss of motivation, loss of interest in social relationships or securing new social contacts, fear of being ridiculed, lack of energy, frequent fatigue, loss of libido, problems in undertaking daily tasks, less ability to socialize freely and difficulty in communication (McKnight and Kashda, 2009).

McKnight and Kashda (2009) reviewed of over 90 depression treatment outcome studies and findings indicates that less than 5% of clinical trials measures or reports functional outcomes. However, social function changes and changes in social relationships are said to lag depression symptom changes. Social function improvement seems to depend on the characteristics of the treatment (e.g. duration, strength, and modality) and patient (e.g. personality disorder, comorbid medical or mental health conditions, physical fitness, cognitive functioning, coping styles). Despite the complexities of the relationship, between depression and social function, there is one clear finding from the literature – social functioning changes follow depressive symptoms changes, but less is known to what degree or for how long time (McKnight and Kashdan, 2009).

Kennedy and colleagues (2007) conducted a comprehensive review on long-term social functioning after depression treated by psychiatrist. They concluded that few outcome studies published had described long-term functional impairment in the majority of patients, but have been limited by methodological shortcomings. Long-term outcomes studies in psychiatric settings have shown that approximately 10% of patients never fully recover from their index

episode. Of those who did recover 60-95% recurrent over the period of 10-25 years (Kennedy et al., 2007). Despite impressive levels of treatment received in numbers of naturalistic studies, similar clinical long-term outcomes in rates of recovery, recurrence and chronicity were reported compared to earlier outcome studies of depression treated by specialists (Kennedy et al., 2007).

As stated before, a number of studies have shown that impairment in social functioning may persists even after remission from depression in both unipolar and bipolar samples. One third of patients have appeared to continue to have residual or subsyndromal depression with social functional impairment comparable to those not diagnosed with major depression (Kennedy et al., 2007). The question of why patients continue to experience psychosocial impairment after remission from depression has not yet been answered; however, the answer may lie in the measurement of depression. It may not be possible to capture the social aspect of depressive disorder since studies to date have rarely used standardized rating scales and rarely measures longitudinal social functioning.

Wells et al. (1989) conducted a study on patients with depressive disorder and depressive symptoms (n=1,137) and compared it with patients with no chronic conditions (n=2,577). They found that depressive disorders were associated with lower functional level (physical, social and role), worse perceived health and more experience of pain compared with the sample without chronic condition. Further, social functioning was worse in depressed patients compared with patients with numbers of medical conditions. Results from the LIDO (Longitudinal Investigation of Depression Outcomes) study (n=18,456), which was conducted in six countries: Israel, Brazil, Australia, Spain, Russia and US, suggests that this effect is cross-cultural (Herrman et al., (2002).

Elgie and Morselli (2009) review the literature published from 1970 till 2004 on social functioning in bipolar patients in the maintenance phase and the perception and perspective of patients, relatives and advocacy originations. They identified 17 studies on total of >6,500 patients from 17 countries. More than 80% of patients had persisted difficulties in social relationships years after stabilization. The areas reported difficulties were: negative impact on lifestyle, stigmatizion, difficult interpersonal relationships within family, poor interpersonal relationships at social and leisure level, and problems with employment (finding or retaining employment). Recent studies have shown significant lower social function scores for bipolar patient compared to unipolar patients Elgie and Morcelli (2009).

The factors described below are said to influence social functioning and social relationships in patients diagnosed with depression.

2.2.4.1 Severity of illness, age, gender and marital status

Kennedy and colleges (2003) did an 8-11 years follow-up study of a cohort of 70 severe recurrent patients with depression. Greater severity of illness, higher Hamilton depression score at index and number of previous episodes of depression, were the most consistent predictors of poor outcome. Severity of depressive symptoms has been associated with longer time to recovery and more chronic course in numerous follow up studies (Kennedy et al., 2003). Younger age at first onset of depression was also significant predictor of poorer outcome of depression as well as female gender (Elgie and Morselli, 2009; Kennedy et al., 2003).

Depression is highly prevalent in older adults where up to 15% of community population suffers and over 20% of nursing homes residents have the diagnosis of major depression and even more have depressive symptoms. Despite this high prevalence rate depression continue to be under-diagnosed and un-treated in older adults (Jongenelis, 2004;

Martin et al., 2008) . Smith and Hirdes (2009) conducted an exploratory study to identify factors associated with informal social isolation among geriatric psychiatric patients. They found that earlier age of onset of a mental illness predicted less established and maintained social ties throughout life.

Kendler et al. (2005) interviewed 1,057 pairs of dizygotic opposite sex twins twice one year apart. The women reported higher level of social support than their brothers and the level of social support at index time predicted major depression after follow-up significantly strongly in women than men. According to these findings, women seem to be more sensitive to develop major depression if they reported a low level of social support. However, these finding cannot explain the prevalence of major depression though suggesting gender differences in pathway of risk.

Studies have shown that depressed patients are half as likely to ever been married than non-depressed comparators and twice as likely to been separated or divorced (Coryell et al., 1993; Gutiérrez-Lobos et al., 2000). Quality of marriage seems to matters more than just being married. Although married persons generally have psychological advantages compared to unmarried persons, there is some evidence that unhappily married individuals are worse off, regarding depression, addiction, isolation, than unmarried persons (Coyne and DeLongis, 1986). Intervention to increase social support for individuals who are in low-quality marriage need to focus on resolving marital difficulties directly rather than addition to social support in general (Coyne and DeLongis, 1986).

2.2.4.2. Employment

Employment is related to several positive social outcomes, including increase in social networks, higher income, and improvement in self-esteem (Crisp, 2005; Gutiérrez-Lobos et al., 2000; Melle et al., 2000). Rates of employment among psychiatric patients are low (Crisp, 2000; Elgie and Morselli, 2009; Gutiérrez-Lobos et al., 2000; Kennedy et al., 2007) and low employment rates is one of the lingering effects of mood disorders. European and Nordic studies indicate an employment rate of 15-38 % among psychiatric patients (Melle et al., 2000).

2.2.5.3 Social support and social network

As early as in Durkheim's' book "Suicide" (1897), the French sociologist proposed a theory that social relationships do contribute to the individual's health. Since then there are abundant evidence in the literature that social support is important for the individuals' quality of life and physical and mental health (Berkman et al, 2000; Burgha, 2003: Cohen et al., 2004: House et al., 1988; Kendler et al., 2005; Hansson and Bjorkman, 2007; Smith and Hirdes, 2009). Experimental and quasi-experimental studies on humans and animals have revealed that subjects with low quantity and quality of social relationships and those who suffer from social isolation do have higher morbidity and mortality from widely varying causes (House et al., 1988).

According to the buffering hypothesis, social support and social networks may affect mental health by buffering the negative effect of stress on mental health. The interaction between mental health, social support, and stress is complex. Two hypotheses exist: 1) the main effect or direct effect hypothesis, and 2) the buffering hypothesis (Cohen, 2004; Olstad et al., 2001). The main/direct hypothesis assumes that social support influences mental health regardless of the

level of stress. The buffer hypothesis assumes that the effect of the social network is to buffer or moderate the effect of the stress on mental health.

Olstad and colleagues (2001) conducted a prospective population health survey with 2,250 participants to evaluate the social support buffer hypothesis with specific stressors including mental distress. When all possible stressors were taking into account the total social support/network buffered the negative effect of stressors upon mental health. The results of this study provide some support for the buffering hypothesis and that women had a larger buffering effect from their social network than men. Further studies are needed to clarify why men do not benefit from the buffering effect as much as women do and what factors can predict social function in men.

Size of primary social network predicts worse clinical outcomes in depressed women than in depressed men (Brugha, 2003). However, studies on community based population do not seem to reveal this conditional effect of gender for the risk of depression. Number of friends seems to affect men more than size of primary social network where men that had none or few friends where at greater risk of mental distress whereas number of friends seems to affect women less (Hintikka et al., 20000). Studies on loneliness also suggest that size of social network is more important to men than women (Burgha, 2003).

2.2.5.3   Adverse life events

Kindler et al. (2005) interviewed 1,942 adult female twins up to four times in nine months period and constructed developmental model to predict depressive episodes. According to their results, the three strongest risk factors were stressful life events in the past year, neuroticism and marital problems.

Studies on adolescents and risk of depression later in life have suggested that lower social class and negative and stressful life events were associated to increased risk of new-onset depression and absence of stressful school and family events was related to improvement in depressive symptoms (Brugha, 2003). Other studies have also suggested that negative life events can predict depression later in life (Brugha, 2003; Wildes et al., 2002).

Post-traumatic stress disorder (PTSD) is a common comorbid disorder among patients with psychiatric disorders (Mathias et al., 2010). Women are more than twice as likely to suffer from PTSD than men (10 − 14% vs. 5 − 6%), but traumatic life events are considered to effect up to one third of psychiatric in-patients and those receiving services in the community (Mathias et al., 2010). This can have dramatic effect on patient's quality of life and recovery.

2.2.5.4 Negative side of social relationships

Social relationships can present problems as well as social support. This is independent of perceived social support (Coyne and DeLongis, 1986). Some studies suggest that the number of members in social network which were a source of conflict has a worse effect on psychosocial well-being than the number of members who were only a source of support. Further, the effects of individuals that experience social impairments, such as in depression, can impose expectation and demands from family and friends that they cannot meet and therefore increase stress and anxiety (Coyne and DeLongis, 1986). According to these findings, there is not necessarily a linear relationship between close social relationships and well-being. Similar to this emotional spousal over-involvement in depression can aggravate and perpetuate other problems such as higher risk of relapse (Coyne and DeLongis, 1986).

Studies of perceived stigmatization has reported up to 85% of patients and some studies that feelings of rejection, fear of being ridiculed, difficulties in expressing opinions, and difficulties in maintaining contacts are common among psychiatric patients and even after recovery these feelings can linger (Elgie and Morselli, 2009).

2.2.5.5 Physical conditions and comorbidity

Some studies have shown that neurocognitive impairment is strongly associated with more severe clinical course of depression and poor social functioning (Greer et al., 2010; Kennedy et al., 2007). Hence, enduring deficits in memory, attention and planning may lead to impairment in social, interpersonal and occupational functioning and these deficits make it difficult to attend to occupational tasks or carry out normal social interactions.

Comorbidity of depression with other Axis I and II psychiatric disorders is considered to be the rule rather than the exception in clinical practice and has implications for clinical and psychosocial outcomes. Those comorbid disorders are most commonly; anxiety, alcohol and substance use disorder and personality disorder. Chronic physical disorders are also highly prevalent in depression (Kennedy et al., 2007) and other specific domains relating to social function are e.g. insomnia, daytime sleepiness, fatigue, somatic symptoms and pain (Greer et al., 2010).

2.2.4 Social function and outcomes of depression

Depression is a remitting, but recurring, disease. With new pharmaceutical and psychosocial interventions one would expect better outcomes for patients with depression (Kennedy et al., 2007; Kennedy et al., 2004; Kennedy and Paykel, 2004; Kennedy et al., 2003; Skärsäter, 2005).

However, there are still few long-term well designed studies especially with regards to the wide spectrum of depression (Kanai, 2003).

Evidence from both controlled clinical trials and follow-up studies have shown that impairments in social functioning are significant, pervasive, and persistent in persons with depression. Although adequate treatments for depression can reduce psychosocial impairment, acceptable outcomes are not yet being achieved in clinical practice

Long term studies of major depression have shown high rates of non-recovery, recurrence, chronic incapacity and mortality (Kennedy, 2004; Kennedy and Paykel, 2004; Kanai et al, 2003; Kennedy et al., 2003; Judd, 2000). Non-remission depression has important functional implications (Judd, 2000; Miller, 1998).

Kennedy and colleges (2003) did an 8-11 years follow-up study of cohort of 70 severe recurrent depressive persons. Data included longitudinal information on the course of the depression, pharmacological and psychosocial treatments, and social functioning. Sixty of the 70 subjects did recover during the follow-up, but two-thirds suffered a recurrence. Social function at follow-up was good with high levels of pharmacological and psychological treatment. We cannot generalize these findings due to the small sample size, and due to the fact that the person's social functioning is assessed with an interview that was not standardized with reliable and validated measurement/instruments.

Kanai and colleges (2003) followed 95 patients with depression for 6 years. They found out that the cumulative probability of remaining well was 57% at 2 years and 35% at 5 years. Even if the person is in remission according to their symptoms of depression, the sub-syndromal state is still associated with substantial functional impairments in the social function. Once again the sample size was relatively small to detect some important, but infrequent predictive factors.

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Kennedy et al. (2004) studied persons with depression for 10 years regarding their syndromal and sub-syndromal symptoms after severe depression. The sample size was small (61 participants). After severe depressive episodes sub-syndromal levels of depression are common and persistent. Participants were interviewed by a psychiatrist with respect to symptoms and social factors such as impact of life events, social support, marital relationship, and expressed emotion outcome. Use of standardized measurements could have given more reliable information.

Kennedy et al. (2007) reviewed the literature on long-term social functioning after patients had been treated by psychiatrists. They concluded as other researchers did that studies have not paid a lot of attention to the psychosocial or functional outcomes of persons with depression. Social functioning appeared to be delayed compared with clinical recovery and tended to persist after the remission of depression. Future outcome studies need to focus on social function over time.

To date still little is known about the impact of residual symptoms on the longer-term clinical course of depression and social functioning. Kennedy and Paykel (2004) followed-up 60 patients for 8-10 years. The study was comprised of two groups 1) remission below residual symptoms (n=40) and, 2) remission with residual symptom n = 19. All patients who experienced remission from major depression underwent longitudinal interviewing on the course of their depression symptoms, treatment, and socioeconomic functioning. Overall, the results revealed that the patients showed greater impairments in social functioning over these 8-10 years. This long-term follow-up study of sample of severe recurrent depressive patients showed that patients who remitted with residual symptomology continued to have more depressive symptoms though they did not meet the criteria for depression. They also showed worse marital problems, and

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poorer work histories, and worse outcomes of social function and relationships. This study showed that many patients with recurrent depression who remitted from depression with residual symptoms continued to have low grade chronic depressive symptoms, which led to impairment in functioning over the long term. There are two major limitations to this study including the small sample and the use of long-term retrospective interview to assess clinical and social outcomes.

2.2.5   Interventions

Recovering from mental illness is a complex individual process and takes place within social context. As stated previously, treatment of major depression has typically been divided into three sequential phases, the acute, continuation and maintenance phase. Recently, major depression has come to be considered a chronic and/or recurrent illness, rather than acute illness (Reesal et al., 2001).

Restoring social function can require psychotherapy, occupational therapy, career counselling and marital or family therapy. The strongest evidence for improvement in social functioning is psychotherapy such as cognitive therapy, cognitive behavioural therapy, and interpersonal therapy (APA, 2000). The benefits of psychotherapy have been demonstrated in numerous studies (APA, 2000; CPA, 2001; Mikolowitz et al., 2007), but the body of evidence suggests that the effects of psychotherapy may be less rapid than those seen with antidepressant therapy or the combination of both.

Intensive psychosocial interventions (CBT, interpersonal, social rhythm therapy and family-focused therapy) significantly improved patients' relationship functioning and satisfaction with life beyond the level of improvements expected from changes in depressed mood

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(Mikolowitz et al., 2007). However, interventions that focus on increasing social support to improve mental health have generally failed to show enduring benefits suggested by observational studies (Brugha, 2003; Cohen, 2004). On the other hand, interventions focused on modifying interpersonal functioning seem promising (Brugha, 2003).

Some clinical trials examining changes in social relationships functioning following antidepressant therapy suggest that patients who achieve remission with antidepressants have substantially improved functioning, but do not always return to their premorbid levels and there has been recent increase to use social function as an outcome measure in clinical trials of psychotropic drugs (Weissmann, 2000). The new antidepressants are more expensive than the older agents and improvements in social functioning such as the return to work may justify their use. New assessments such as vitality, motivation, and performance that go beyond symptom reduction may also capture broader spectrum of outcome for the new drugs (Weissmann, 2000).

A number of earlier intervention studies for depression have shown significant benefits in social relationships functioning, more recent studies appear to have neglected this important area (Miklowitz et al., 2007). Studies on social functioning in depression have the potential to not only improve our understanding of psychiatric diseases, but to enhance current psychosocial and pharmacological interventions.

Schön et al. (2009) conducted a qualitative study in Sweden on 58 out-patients with severe mental illness (schizophrenia, personality disorder or bipolar disorder). Patients were interviewed regarding which factors they regarded as decisive to their recovery process. The interviews were analysed according to grounded theory and revealed the core theme that recovery was a social process. The social process of recovery was analyzed through three overlapping themes; social self, social interventions, and connection to others. It is interesting

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that the participants described that the social relationship with the mental health professional was as important to their recovery as the interventions but the most important contribution to the recovery of the respondents was their formal and informal social network which they said had the "outmost importance for the recovery process" (Schön et al., 2009 p.343).

Clinical practice guidelines have been developed to increase patient's quality of care. They are used worldwide but are different in quality. Some clinical practice guidelines do focus specifically on social function and other social factors of depression (APA, 2000; CPA, 2001; SIGN, 2010), but most include guidelines that are aimed to decrease clinical depressive symptoms not especially social functioning and social relationships. Some clinical guidelines stated that the goal of treatment should include not just absences of clinical depressive symptoms, but also that the patient returns to premorbid social function (CPA, 2001; GPAC, 2007).

Antidepressant medications are the first choice of treatment for moderate and severe depression but in mild form of depression psychotherapy alone is considered to be as effective as antidepressant medication (GPAC, 2007; NICE, 2009; UMHS, 2008). However, combined treatment with medication and psychotherapy is the most effective treatment for major depressive disorder and studies have shown combined therapy to be more effective to increase social functioning (Dank Sundhedsstyrelsen, 2007).

The Scottish Intercollegiate Guidelines Network (SIGN) developed guidelines for non-pharmaceutical management of depression in adults (SIGN, 2010). Over 40 non-pharmaceutical interventions were reviewed but only nine were recommended based on strong evidence. A summary of recommendations graded related to the strength of the evidence on which the recommendation is based follows:

Psychological therapies:

- Behavioural activation, which focuses on activity scheduling to encourage patients to approach activities that they are avoiding and on analysing the function of cognitive processes (grade A)

- Individual Cognitive Behavioural Therapy (CBT), aims to make connections between thinking, emotions, physiology and behaviour to change underlying beliefs and behavioural patterns (grade A)

- Interpersonal therapy , focus on reducing symptoms by working on improving the quality of the patients interpersonal relationships (grade A)

- Mindfulness based cognitive therapy in a group setting (grade B)

- Problem solving therapy (grade B)

- Short term psychodynamic therapy (grade B)

Self help:

- Guided self help based on CBT or behavioural principles (grade A)

- Within the context of self help, computerised CBT (grade A)

- Structured exercise (grade B)

Couple-focused therapy is recommended as a best practice based on clinical experience but well controlled randomized studies have to date failed to show its effectiveness. Couples therapy should be considered where current relationship is contributing to the depression or where partners involvement is considered to be therapeutic benefit (Dansk Sundhedsstyrelsen, 2007; SIGN, 2010; NICE, 2009; UMHS, 2008).

Few clinical practice guidelines have to date assessed interventions that focus on entirely on improving social functioning and social relationships. However, interventions such as

interpersonal therapy and cognitive behavioural therapy include interventions to improve

behaviour and understanding social relationships.

3.   Study Objectives and Research Questions

As discussed in the literature review, depression is a serious global problem. Although symptoms of depression are often treatable, improvement in quality of social relationships sometimes appeared to be delayed, and tended to persist after the remission of depression (Kennedy et al., 2004; Kennedy et al., 2003; Kanai, 2003; Judd; 2000; Miller, 1998). A higher level of pharmacological and psychosocial interventions seems to lower the risk of deficits of social function (Kennedy et al., 2003).

The burden of depression on the individual, family, and community makes depressive symptoms one of the major health care problems to be addressed. Increased studies on depression have the potential to prevent depression, improve knowledge and awareness, and minimize stigma and negative impact on quality of life.

Researchers have not paid a lot of attention to the psychosocial or functional outcomes of persons with depression (Kennedy, 2007). Future outcome studies need to focus on social function over time and more evidence on improvement rates in depressive symptoms for in-patient psychiatry is needed. Therefore measures with valid and reliable measurement tools such as the interRAI Depression Rating Scale (DRS) are necessary. The information on the improvement rates of depression and social function are important for care planning and decision making.

In this study, a new RAI-MH Social Relationship Clinical Assessment Protocol (Social Relationship CAP) was presented and used to predict improvement in depressive symptoms over time. The change in distribution of problems relating to social relationships for in-patient psychiatry will hopefully give information on possible positive effect on social relationships and depression.

In this study the following research questions were answered:

Research question 1: What is the rate of improvement in depressive symptoms in in-patient psychiatry?

Research question 2: Does quality of social relationships at baseline predict improvement in depressive symptoms after adjusting for other risk factors?

4.   Methods

4.1   Sample

This study is based on a secondary analysis of data from the Ontario Mental Health Reporting

System (OMHRS). The study design was a longitudinal cohort study using data gathered as part

of normal clinical practice with routine RAI-MH assessments of psychiatric in-patients.

Patients eligible for the study were adults 18 years of age and older, including newly

admitted and existing patients, and patients that had at least two assessments (6388 patients did

not have second assessment in the available data set). Data from 71 facilities provided 125,120

assessments. The sample is comprised of patients from acute, long stay, addiction, psychiatric

crisis units and forensic units. The patients were assessed at two points of times (initial and

quarterly/change in status/discharge). Data collection took place from October 2005 to March

2009.

Each patient was assessed by clinical team of mental health professionals (e.g., nurses,

psychiatrists, social workers, occupational therapists, psychologists). The assessors had received

formal training in using RAI-MH.

Ethical clearance for the OMHRS was obtained from the Office of Research Ethics (see

Appendix B) and full ethical clearance from Office of Research Ethics for this study is approved

(ORE # : 14148).

4.2   Measures

interRAI is a non-profit international network of approximately 60 researcher from around 30

countries. The goal of the interRAI fellowship is to improve quality of care of patient from

variety of populations in health care and social services settings by provide high quality data that promotes evidence-informed practice and decision making http://www.interrai.org).

interRAI have developed a suite of eleven standardized comprehensive multidimensional instruments. With their associated clinical applications, these instruments provide an integrated health information system with a common language that enables service providers from different settings to improve quality of care and allow comparison between different populations, settings and facilities.

To date the suite of instruments is comprised of following instruments: interRAI HC (Home Care); interRAI CHA (Community Health Assessment); interRAI CA (Contact Assessment); interRAI LTCF (Long Term Care Facility); interRAI AL (Assissted Living); interRAI AC (Acute Care): interRAI PAC (Post-Acute Care); interRAI MH (Mental Health); interRAI CMH (Community Mental Health); interRAI ESP (Emergency Screener for Psychiatry); interRAI PC (Palliative Care); and interRAI ID (Intellectual Disability). More instruments are currently in development.

4.2.1   RAI-MH

The Resident Assessment Instrument - Mental Health (RAI-MH) was developed by a six-country interRAI research team working in collaboration with Ontario's Joint Planning and Policy Committee (JPPC) to help evaluate the needs of psychiatric in-patients. Its updated version, RAI-MH 2.0 was mandated for use in all Ontario adult in-patient psychiatry beds in October 2005 (see http://www.interrai.org/section/view/?fnode=21). The RAI-MH is a comprehensive inter-disciplinary instrument that assesses needs, strengths, and service preferences of adult inpatient population in acute, long-term, geriatric and forensic psychiatric units. The RAI-MH includes

comprehensive information to support individual care planning with 21 interRAI Clinical Assessment Protocols (CAPs). The RAI-MH also includes outcome measures, quality indicators and a case-mix classification system to describe the resource intensity of patients (Hirdes et al., 2003; Hirdes et al., 2001; Hirdes et al., 2002, www.interRAI, 2010). The RAI-MH instrument is comprised of 345 items in 25 domains.

A number of studies have used the RAI-MH to investigate mental health issues example includes, potential somatisation disorder in adult psychiatric inpatients (Rabinowitz, Hirdes & Desjardins, 2006); needs and services offered to patient with intellectual disabilities receiving inpatient psychiatric care (Martin, Hirdes & Fries, 2007b); prevalence and prediction of sexual dysfunction in psychiatric inpatients (Perlman et al., 2007) and a study on care planning strategy for traumatic life events in community mental health and inpatient psychiatry (Mathias et al., 2010). Several studies have provided evidence on the interRAI family instrument's psychometric properties (Martin et al., 2007a; Poss et al., 2008).

The RAI-MH has shown to be both reliable and valid (Hirdes et al., 2002). The RAI-MH has been evaluated and revised to establish reliability and validity by using a number of methods. Inter-rater reliability by dual assessments on 261 psychiatric inpatients, showed by using kappa statistics and percentage agreement between raters, that the RAI-MH has acceptable to excellent reliability in almost all domains of the instrument. Test on convergent validity provided promising evidence but further studies are needed (Hirdes et al., 2002). A more recent reliability study for multiple instruments in the interRAI suite, including the MH, provided comparable results (Hirdes et al., 2008).

4.2.2   Outcome measures scales embedded in the RAI-MH

Sixteen outcome measures scales are presently embedded in the RAI-MH:

1) Activities of Daily Living (ADL) Hierarchy Scale which measures functional performance and reflects the person's ability to carry out activity of daily living (Morris et al., 1999)

2) Instrumental Activities of Daily Living Scale (IADL) (Morris et al., 1999) estimates higher level of everyday living such as meal preparations, housework and shopping,

3) CAGE Addiction Scale, which is a substance use screener and indicates potential problems with addiction,

4) Cognitive Performance Scale (CPS), measures person's cognitive status (Morris et al., 1994; Hawes et al., 1995),

5) Depression Rating Scale (DRS), indicates depressive mood (Koehler et al., 2005; Burrows et al., 2000),

6) Positive Symptoms Scale (PSS), measures psychotic symptoms,

7) Risk of Harm to Others (RHO), which is a predictive algorithm for violent or aggressive behaviour,

8) Aggressive Behaviour Scale, which is a summary scale measuring verbal abuse, physical abuse, resisting care and socially inappropriate behaviour (Perlman & Hirdes, 2009),

9) Changes in Health, End-stage and Signs and Symptoms (CHESS) reflect person's health instability (Hirdes et al., 2003),

10) Pain Scale, measures presence and intensity of pain (Fries et al., 2001),

12) Anhedonia, indicates person's lack of pleasure in life,

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13) Communication, measures how person expresses self and his/her ability to understand others,

14) Mania, which considers symptoms related to mania,

15) Self Care Index (SCI), reflects the risk of inability to take care of self due to psychiatric symptoms, and

16) Severity of Self-harm (SOS), which deals with the risk of involuntary and purposeful self-injury.

The DRS has been validated against Hamilton Depression Rating Scale and the Cornell Scale (Burrows et al., 2000; Frome, 2000). The DRS was found to be highly correlated to Hamilton Depression Rating Scale (r = 0.70) with high sensitivity and specificity in a sample of geriatric patients (Burrows et al., 2000).

Evaluation of the DRS have demonstrated acceptable to excellent reliability of Cronbach's alpha scores varying from 0.74 to 0.90. DRS have also been found to have good convergent validity (Hirdes et al., 2002; Martin et al., 2007a). For example there is a clear association between DRS scores and suicidality where patients that have a history of suicide attempt in the last 12 months and those who had suicidal ideation in the last month had higher DRS scores than patients not showing those indicators (t=6,59, p< .0001 and t= 7,54, p< .0001, respectively) (Hirdes et al., 2002). When tested against depression diagnosis in nursing homes the DRS have been found to have sensitivity of 91% and specificity of 69% (Burrows et al., 2000).

The DRS is a 14 point observer-rated scale that indicates possible depression if the score is 3 or more while a score of 6 or more indicates possible severe depression. The items included in the DRS are: 1) Sad pained facial expression, 2) tearfulness, 3) negative statements, 4) anxious

complaints, 5) fears/phobias, 6) repetitive health complaint, and 7) persistent anger. Each indicator is coded 0, 1 or 2 based on presence and frequency of depressive symptoms. The DRS includes symptoms of dysphoria and anxiety, but not anhedonia, psychomotor retardation, change in appetite, weight loss, sleep disturbances, or suicidality.

The DRS has also been examined against the Geriatric Depression Scale (GDS). Koehler et al. (2005) examine the Depression Rating Scale (DRS) and Geriatric Depression Scale (GDS) and found that they were weakly correlated but both had good internal consistency as a measure of reliability and both were comparable related to depression diagnosis. The result of this study indicates that DRS and GDS measures different aspects of depression especially among geriatric patient with cognitive impairments.

Martin et al. (2007) did a follow-up study on older hospitalized adults admitted in Complex Continuing Care. The objectives of the study were to examine the ability of DRS to predict depression in patient without depressive symptoms at the time of admission. The DRS was found to predict depression in the patient in all seven indicators and all the items included in the DRS was found to be significantly associated with increased odds of having new diagnosis of depression at the time of follow-up. Not only DRS items were predictors of depression but two additional items in the MDS 2.0; sadness over past roles and anhedonia were also significant predictors of depression. These findings can indicate that newly admitted patients are under diagnosed and lower threshold value of DRS (3 or more) could identify those patients.

Previous interRAI research has validated other RAI-MH outcome scales such as the Mania scale, SCI, and SOS. Findings from these studies are unpublished, but forthcoming. In this study, scores of all scales used are collapsed into categories based on conventional cut-offs

for existing scales (e.g., DRS) which take into account the presence, severity and frequency of symptoms.

4.2.3   RAI-MH Clinical Assessment Protocols

As stated earlier, the RAI-MH system presently includes 21 Clinical Assessment Protocols (CAPs) (Fries et al., 2007: Hirdes et al., 2003, Martin et al., 2009) that may be used to support care plan related decisions. The main goal of the CAPs is to provide inter-disciplinary holistic and outcome focused care plan built on the patient's strengths, preferences and needs. These protocols are not diagnoses, but if triggered, point to the person-focused need to consider specific issues in the care plan through more complex triggering algorithms based on outcomes could be more capable of differentiating patients. Systematic and routine reassessment can evaluate changes in clinical status and needs of interventions. Each CAP includes a statement of clinical issues at hand, triggers, and suggested goals of care and CAP guidelines which provide information on international evidence-based clinical practice.

The protocols are presently being revised based on newly available data. The following CAPs have to date been developed:

- o   Social Relationships
- o   Harm to Others
- o   Financial Issues
- o   Interpersonal Conflict
- o   Control Interventions
- o   Vocational Rehabilitation
- o   Tobacco Use
- o   Substance Use

- Sleep Disturbance

- Medication Management and Adherence

- Social Support (for interRAI-CMH only)

- Support Systems for Discharge

- Criminal Activity

- Traumatic Life Events

- Suicicidality and Purposeful Self-Harm

- Pain

- Rehospitalisation

- Exercise

- Weight Management

- Self Care

- Falls

4.2.4 Social Relationships CAP

"Social relationships refers to how a person relates to others, how other people react to that person, and how the person initiates interaction, engage with others and participates in the broader community" (unpublished interRAI Social Relationships CAP).

The Social Relationships CAP aims "to help the individual maintain or restore satisfactory life roles, social relation or pleasurable activities, or to develop new ones" (Smith et al., 2003 pp. 150).The new Social Relationships CAP is triggered if one or more of the following are present: 1) patient reports having no confidant; 2) withdrawal from activities of longstanding interest; 3) participation in social activities of long-standing interest occurred more than one

month ago; 4) telephone or e-mail contact with long-standing social relation/family member occurred more than one month ago; 5) no visits by family/others in the last month 6) reduced social interactions; 7) patient or others believe that his or her relationship with immediate family members is dysfunctional; 8) family/closed friends report feeling overwhelmed by patient's illness, and 9) conflict laden or severe relationships (see table 2). The Social Relationships CAP has two level subscales that indicate the severity of problems in patient's social relationships.

4.2.5 Variables

The Depression Rating Scale (DRS) scale was the dependent variable in this analysis, and Social Relationships CAP the main independent variable of interest. The new Social Relationships CAP was coded to create variable identifying presence of problem with family, social isolation and/or person reports having no confidante. The social isolation and family issues subscales included following RAI-MH items (Table 2):

Table 2 **Social Relationships CAP trigger items**

RAI-MH Item identifier	Social relationships CAP Triggers
O2a	Patient reports having no confidant
Triggered to reduce social isolation and family dysfunction (Isolation)	
O6a	No participation in activities of long standing interest in the last 30 days
B1z	Withdrawal from activities of interest
B1bb	Reduced social interactions
O6c	No in-person, telephone or email contact with family or friends in the last 30 days
O6b	No visit from family/friends in the last 30 days
Triggered to improve close friendships and family functioning (Family issues)	
O2b	Family/closed friends reports to be overwhelmed by patient's illness
O1	Person or others consider family roles to be dysfunctional
J1e	Severe or conflict-laden relationship within the last year

These two variables, family issues and social isolation, and the RAI-MH item O2a, (patient reports to having no confidante), created the new variable, Social Relationships CAP (see Figure 1). The highest value (2) indicates that persons have problems in all three domains and lowest value for persons with persons with no problems in any of the domains (see Figure 1).

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Figure 1   New Social Relationship CAP code

Isolation	Family Issues	O2a No Confidante

```
If O6a = 3
or
O6b = 3
or
B1z in (1,2,3)
or
B1bb in (1,2,3)

and O6c = 3

Then Isolation = 1
Else Isolation = 0
```

```
If O2b = 1
or
O1 in (1,2,3)
or
J1e in (2,3)

Then Family Issues = 1
Else Family Issues = 0
```

```
If Family Issue = 1

and

Isolation = 1

and

O2a = 1

then Social Relationships trigger = 2

else if Family issue =1 then Social Relationships trigger = 1

else Social Relationships trigger = 0
```

Covariates explored included, demographic characteristics (age, sex, marital status, type of unit, employment, living arrangement, aboriginal origin, length of stay, time between assessments), clinical characteristics (psychiatric diagnosis (mood disorders, substance-related disorders, schizophrenia, anxiety disorders, cognitive disorders, eating disorders, personality disorders, and adjustment disorders), psychiatric multi-morbidity, DRS scores, PSS long form scores, CAGE scores, Pain Scale scores, Mania Scale scores), functional characteristics (CPS scores, ADL hierarchy scores, SCI scores) and behavioural characteristics (ABS scores, SOS scores, and RHO scores).

4.3   Analysis

The dataset OMHRS were created using SAS version 9.2. The analysis focus on the two main research questions:

1. **What is the rate of improvement in depressive symptoms in in-patient psychiatry?**

The mean DRS score for the whole sample and the sub-sample of patients with mood disorder and DRS 3 or more was calculated and mean changes from the first assessment to the second assessment was measured. Chi-square test (χ^2) was used to evaluate the significant difference between categorical variables on bivariate level

2. **Does presence of Social Relationships CAP at baseline predict improvement in depressive symptoms after adjusting for other risk factors?**

Changes in severity of depressive symptoms over time were calculated as well as changes of threshold value (DRS 3 or more). Logistic regression for everyone with a baseline DRS 3 or

more and diagnosis of mood disorder was used to determine if presence of baseline Social Relationship CAP predict transitions in depressive symptoms. Other independent variables (covariates) include patient's demographics, clinical, functional, and behavioural characteristics as described before. Chi-square test (χ^2) was used to evaluate the effect of the potential predictor variables in the logistic regression model at multivariate level. The significance level to retain variables in the model was p=0.05.

5. Results

The results presented in this section are based on secondary analyses of data from a sample of 125,120 in-patients from 71 psychiatric facilities in Ontario. Data from the Ontario Mental Health Reporting System (OMHRS) were gathered as part of routine clinical practice using RAI-MH assessments in acute, addiction, forensic, long-term and psychiatric crisis units. Data analysis focused on comparing patient's status by admission and discharge dates. Therefore 6,384 patients without a discharge date were excluded from this cohort. The final sample consisted of 125,120 patients. The sub-sample of interest included patients with a diagnosis of a mood disorders (primary, secondary or tertiary) and depressive symptoms (DRS score 3 or more), which indicates clinical depression. Those who fit these criteria were a sub-sample of 38,823 patients or about 30.0% of the full sample.

The results are presented in descriptive analysis for the full sample and sub-sample, but bivariate and multivariate statistical analysis for the sub-sample alone. Logistic regression analysis was performed to predict rates of improvement of depressive symptoms.

5.1 Univariate Analysis

5.1.1 Sample's characteristics

Samples characteristics are presented in Table 3. Females represented about two thirds (n =24,467) of the sub-sample compared with 50% (n = 62,402) of the full sample. Patients with mood disorder and DRS≥ 3 were more likely to be married than the patients in the full sample, 36.6% and 28.4% respectively. Patients in the sub-sample were older than in the full sample -

11.6% were between 18 – 25 years old in the sub-sample, but 14.4% in the full sample. Patients in the sub-sample were more likely to live in a private home before admission (82.6 % compared to 76.5% of those in the full sample) and they were also more likely to live with their families (40.1% vs. 30.0%). The sub-sample's patients were slightly more likely to be employed (23.7% compared to 20.7% in the full sample) and less likely to receive disability insurance (18.2 % vs. 20.3%). Ninety percent of the sub-sample patients were admitted to an acute unit compared to 82.6% of the full sample. The patients in the sub-sample were more likely to be older at first psychiatric hospitalization, but there was only a small difference was between the samples regarding number of lifetime hospitalizations.

Patients that had refused medication in last 3 days comprised 14.7% of the full sample compared with 12.6% in the sub-sample. One quarter of the patients in the sub-sample experienced poor physical health compared to 17.6% of those in the full sample. The presence of trauma was more prevalent in the sub-sample where 20.1% had history of trauma and 13.0% had been abused in the last 7 days.

Table 3   **Patient's characteristics**

Characteristics	Sample n = 125,120 % (n)	Sub-sample Patient with mood disorder and DRS ≥ 3 n = 38,823 % (n)
Sex		
female	49.9 (62,400)	63.0 (24,470)
Married	28.4 (35,580)	36.6 (14,220)
Age group		
18 – 25	14.4 (17,980)	11.6 (4,510)
26 – 45	39.9 (49,960)	37.8 (14,690)
46 – 64	33.9 (42,460)	37.8 (14,680)
65 ≥	11.8 (14,720)	12.7 (4,950)
Aboriginal origin	3.2 (3,970)	2.9 (1,140)
Employed	20.7 (25,840)	23.7 (9,210)
Disability insurance	20.3 (25,450)	18.2 (7,070)
Admitted from home	76.5 (95,710)	82.7 (32,120)
Living arrangements		
lived alone	33.6 (42,080)	32.7 (12,690)
with family	30.0 (37,480)	40.1 (15,570)
with others	36.4 (45,550)	27.2 (10,570)
Age at first hospitalization		
0 – 14	5.3 (6,630)	5.4 (2,090)
15 – 24	31.2 (38,980)	25.6 (9,920)
25 – 44	40.9 (51,210)	42.8 (16,610)
45 ≥	22.6 (28,300)	26.3 (10,200)

Table 3 Patient's characteristics cont'

Characteristics	Sample n = 125,120 mean (std)	Sub-sample Patient with mood disorder and DRS ≥ 3 n = 38,823 mean (std)
Number of prior psychiatric hospitalization		
none	28.6 (35,810)	29.7 (11,545)
1 – 3	35.7 (44,620)	36.8 (14,280)
4 – 5	14.3 (17,900)	13.4 (5,200)
6 ≥	21.4 (26,790)	20.1 (7,790)
Type of unit		
acute unit	82.6 (103,180)	90.4 (35,040)
addiction unit	5.5 (6,900)	1.4 (529)
forensic unit	2.5 (3,120)	0.5 (192)
long-term unit psychiatric	8.1 (10,170)	6.6 (2,540)
crisis unit	1.3 (1,610)	1.2 (480)
Medication refusal in last 3 days	14.7 (18,390)	12.6 (4,900)
Poor self-rated physical health	17.6 (21,980)	25.1 (9,730)
History of trauma	14.7 (19,280)	20.1 (7,800)
Victim of an abuse in last 7 days	10.0 (13,200)	13.0 (5,010)

As shown in Table 4, the average age of patients in the sub-sample was older than the patient in the full sample, (46.0 years (std. 16.0) versus 44.4 years (std. 16.3) in the full sample) . The mean length of stay was 26.1 days (std. 58.1) for the full sample but 20.1 days (std. 33.9) for the sub sample.

Table 4   Patient's characteristics: Age, Length of Stay and Time between Assessments

	Sample n = 125,120 mean (std)	Sub-sample Patient with mood disorder and DRS ≥ 3 n = 38,823 mean (std)
Age (years)	44,4 (16.3)	46,0 (16.0)
Length of stay (days)	26,1 (58.1)	20,1 (33.9)
Time between assessments (days)	25,9 (57.9)	19,9 (33.7)

5.1.2   Psychiatric diagnosis

In the full sample 52.7% had mood disorder diagnosis, 41.6% as a primary diagnosis, 9.8% as a secondary diagnosis, and 1.2% as a tertiary diagnosis (see Table 5). As stated earlier, all patients in the sub-sample had a diagnosis of mood disorder, 80.3% as a primary, 17.4% as a secondary, and 2.3% as tertiary diagnosis. Severity of depression was measured with Depression Rating Scale (DRS), where DRS 3 or more indicates possible clinical depressive disorder and score of 6 and more indicates more severe depression. Overall, 54.8% of patients did have a DRS of 3 or more and 40% of patients in the sub-sample had a DRS score of 6 or more.

Table 5   **Patient's characteristics: Diagnosis of Mood Disorders**

	Sample n = 125,120 % (n)	Sub-sample Patient with mood disorder and DRS ≥ 3 n = 38,823 % (n)
Diagnosis of mood disorders	52.7 (65,930)	100 (38,823)
primary	41.6 (52,060)	80.3 (31,180)
secondary	9.8 (12,300)	17.4 (6,770)
tertiary	1.2 (1,560)	2.3 (878)
Baseline DRS score		
0 - 2	45.2 (56,580)	-
3 - 5	38.7 (48,350)	59.4 (23,040)
6 ≥	16.1 (20,190)	40.7 (15,780)
DRS ≥ 3	54.8 (68,540)	-

Table 6 presents the primary, secondary or tertiary psychiatric diagnosis for the full sample and the sub-sample (patients could be diagnosed with up to three diagnoses). While the most common psychiatric diagnosis in the full sample was mood disorder (52.7% - reported in Table 5), schizophrenia (35.3%) and substance-related disorders (25.3%) also affected substantial subgroups in these hospitals. Substance-related disorder diagnosis were the most common other psychiatric diagnosis in the sub-sample (19.6%) followed be anxiety disorders (16.0%) and personality disorders (13.1%). Eating disorder was the least common diagnosis in both samples, affecting about 1.5% of patients. Other DSM diagnoses were not included in the analysis due to low prevalence.

Table 6   Patient's Characteristics: Psychiatric diagnosis

Diagnosis	Sample n = 125,120 % (n)	Sub-sample Patient with mood disorder and DRS ≥ 3 n = 38,823 % (n)
Cognitive disorders	5.8 (7,260)	3.3 (1,280)
Substance-related disorders	25.3 (31,640)	19.6 (7,630)
Schizophrenia	35.3 (44,160)	8.8 (3,420)
Anxiety disorders	11.3 (14,120)	16.0 (6,220)
Eating disorders	1.5 (1,840)	1.6 (604)
Adjustment disorders	4.1 (5,130)	3.7 (1,450)
Personality disorders	10.7 (13,350)	13.1 (5,090)

5.1.3   Presence of Social Relationships Clinical Assessment Protocol (CAP)

The presence of the Social Relationships Clinical Assessment Protocol (CAP) in the full sample

and sub-sample is presented in Table 7. The Social Relationships CAP has three levels: level

zero - not triggered; level 1 - triggered if the patient has problems in family relationships; and

level 2 - triggered if the patient has difficulties with both family relationships and social

isolation. A comparison of the prevalence of the CAP between the full sample and the sub-

sample, revealed a higher prevalence in patients with mood disorders and depressive symptoms

About 40% of patients in the full sample did not trigger the CAP compared with about one third

of the sub-sample. When looked at the triggering rates, no differences were found between the

full sample and the sub-sample regarding triggering level 1 (family relationships issues alone)

but 35.7% of the patients in the sub-sample triggered level 2 compared to 30.3% in the full sample.

Table 7 **Prevalence of Social Relationships CAP by triggering levels**

	Sample n = 125,120 % (n)	Sub-sample Patient with mood disorder and DRS ≥ 3 n = 38,823 % (n)
Isolation	67.1 (83,940)	76.8 (29,820)
Family Issues	60.8 (76,030)	66.1 (25,660)
Social Relationships CAP:		
Not triggered	39.2 (49,090)	33.9 (13,170)
Level 1	30.5 (38,110)	30.4 (11,800)
Level 2	30.3 (37,920)	35.7 (13,860)

Table 8 presents the prevalence of the individual RAI-MH items that contribute to the Social Relationships CAP for both full sample and the sub-sample. The items of reduced social interaction and withdrawal from activities in last 3 days, were more prevalent in in the sub-sample. Forty-one percent of patients in the full sample experienced withdrawal from activities of interest compared to 58.5% of the sub-sample, and 50.1% of patients in the full sample had reduced social interactions but 62.2% of the patients in the sub-sample. These indicators of social withdrawal may also be considered to be symptoms of anhedonia, which may explain their higher prevalence in the subsample. The prevalence of the triggering items no participation in activities of long standing interest in the last 30 days and family/closed friends reports to be

overwhelmed by patient's illness, were similar to both full sample and sub-sample, about 26% and 40% respectively.

Overall, patients in the sub-sample triggered items related to social isolation more frequently, but less difference were evident between the samples regarding items regarding family relationships.

Table 8   **Social Relationships CAP individual triggers**

RAI-MH Item identifier	Social relationships CAP Triggers	Sample n = 125,120	Sub-sample n = 38,823
O2a	Patient reports having no confidant	18.5 (23,190)	22.6 (8,780)
	Triggers Isolation		
O6a	No participation in activities of long standing interest in the last 30 days	26.1 (32,690)	25.8 (10,010)
B1z	Withdrawal from activities of interest in last 3 days	41.2 (51,530)	58.5 (22,710)
B1bb	Reduced social interactions in last 3 days	50.1 (62,650)	62.2 (24,130)
O6c	No in-person, telephone or email contact with family or friends in the last 30 days	9.6 (11,990)	6.7 (2,590)
O6b	No visit from family/friends in the last 30 days	11.4 (14,260)	8.5 (3,290)
	Triggers Family Issues		
O2b	Family/closed friends reports to be overwhelmed by patient's illness	40.3 (50,440)	41.6 (16,150)
O1	Person or others consider family roles to be dysfunctional	37.2 (46,540)	42.0 (16,320)
J1e	Severe or conflict-laden relationship within the last year	21.1 (26,380)	27.0 (10,470)

5.1.4 Interventions

Table 9 presents the type of interventions patients received during their hospital stay. Patients in the sub-sample receive more individual therapy than patients in the full sample (67.0% vs. 60.7%), but no information is available on what kind of individual interventions these patients received. Relatively small differences were found between other types of interventions.

Table 9   Patient's characteristics: Interventions

Interventions	Sample n = 125,120 % (n)	Sub-sample Patient with mood disorder and DRS ≥ 3 n = 38,823 % (n)
Individual therapy	60.7 (75,930)	67.0 (26,010)
Group therapy	31.6 (39,500)	33.3 (12,910)
Family/couple therapy	6.7 (8,360)	6.5 (2,500)
Self-help group	9.6 (12,030)	7.6 (2,940)

5.2   Bivariate Analyses

5.2.1   Social Relationships CAP and patient's characteristics

Table 10 presents bivariate analysis of the sub-sample's characteristics by the Social Relationship CAP triggering levels. No significant difference was between the distribution of triggering levels between men and women (p = 0.08). Married patients had significantly lower trigger rates at level 2, but were more likely to trigger level 1. The likelihood of triggering Social Relationships CAP decreases with age where patients 65 years of age and older were most likely

to not trigger the CAP (43.9%), but patients between 18 -25 years old were least likely to not

trigger (25.9%) and the younger patients had as well more severe family relationships difficulties

than any other age-group. Patients admitted to forensics units were most likely to not trigger the

Social Relationships CAP (40.1%), but patients in addiction units were most likely to trigger the

Social Relationships CAP on both level 1 and level 2 (45.0% and 43.7, respectively).

Patients of aboriginal origin were somewhat more likely to trigger the CAP compared to

other patients, especially level 1 of family issues (35.7% versus 30.2%). Small but significant

difference in prevalence of the Social Relationships CAP were evident between employed

patients and those patients that did not work, where employed patients were more likely to

trigger level 2 (34.8% and 38.4% respectively). However, patients receiving disability insurance

were less likely to have problems in social relationships. Patients living in a private home and

those who lived with family at the time of admission were significantly more likely to experience

problems in both in family relationships and social isolation.

Table 10 also presents variables related to mental health service history. Young age (0 –

24 years) of first psychiatric hospitalization was significantly associated with higher triggering

rates of the Social Relationships CAP and those who were 45 and older at first admission were

least likely to trigger the CAP. Patients with no prior psychiatric hospitalization were

significantly most likely to trigger level 2, of both problems with family relationships and social

isolation, compared with those with the highest number of hospitalizations (6 or more

admissions), 38.0% and 32.3%, respectively.

Having refused to take prescribed medication in last 3 days was significantly associated

with having family problems (36.4% vs. 29.5%), but no difference were between the groups

regarding presence of both family issues and social isolation. Patients reporting poor physical

health were more likely to have both problems in family relationships and social isolation compared to patients without physical health issues (39.3% vs. 34.5%).

The relationship between the Trauma CAP and Social Relationships CAP was evaluated and revealed positive association where those trigging the Trauma CAP were significantly more likely to trigger both levels of the Social Relationships CAP compared to those who did not have history of traumatizing experience. Over 40% of patients that currently experience traumatic events trigger the CAP compared to 32.7% of those who did not trigger the Trauma CAP.

Patients with high baseline DRS score (6 or more) were more likely to trigger level 2 of the Social Relationships CAP than those with lower DRS scores (3 − 5), 38.6% vs. 33.7%. No difference was found between the triggering rates of level 1.

Table 10   **Patient's characteristics by Social Relationships CAP triggering levels**

	Triggering levels			Chi-square	df	p
	0	**1**	**2**			
	% (n)	**% (n)**	**% (n)**	χ^2		**value**
Sex						
female	33.6 (8,230)	30.2 (7,380)	36.2 (8,860)	8.3	2	0.08
male	34.4 (4,930)	30.8 (4,410)	34.8 (4,990)			
Marital status						
married	34.7 (8,550)	32.4 (7,980)	32.9 (8080)	255.2	2	< .0001
not married	32.5 (4,620)	26.9 (3,830)	40.6 (5,770)			
Age-group						
18-25	25.9 (1,670)	37.3 (1,680)	36.8 (1,660)	613.3	6	< .0001
26-44	30.4 (4,470)	33.3 (4,890)	36.3 (5,330)			
45-64	36.5 (5,360)	28.8 (4,230)	34.7 (5,090)			
65+	43.9 (2,170)	20.2 (1,000)	35.9 (1,780)			
Type of unit						
acute unit	34.5 (12,100)	30.4 (10,660)	35.1 (12,280)	216.4	8	< .0001
addiction unit	11.3 (60)	45.0 (238)	43.7 (231)			
forensic unit	40.1 (77)	28.1 (54)	31.8 (61)			
long-term unit	31.9 (811)	25.6 (651)	42.5 (1,080)			
psychiatric crisis unit	23.5 (113)	36.9 (177)	39.6 (190)			
Aboriginal origin						
yes	31.7 (362)	35.7 (407)	32.6 (372)	15.6	2	.0004
no	34.0 (12,810)	30.2 (11,390)	35.8 (13,480)			
Employment status						
employed	32.0 (2,950)	29.6 (2,720)	38.4 (3,540)	40.2	2	< .0001
not employed	34.5 (10,220)	30.7 (9,080)	34.8 (10,320)			
Source of income						
Disability insurance	35.2 (2,490)	30.8 (2,180)	34.0 (2,410)	11.2	2	.004
Other	33.6 (10,680)	30.3 (9,630)	36.1 (11,450)			

Table 10   Patient's characteristics by Social Relationships CAP triggering levels (sub-sample n = 38,823) cont'

	Triggering levels			Chi-square	df	p
	0 **% (n)**	**1** **% (n)**	**2** **% (n)**	χ^2		value
Residential status						
admitted from home	33.1 (10,630)	30.1 (9,720)	36.7 (11,780)	88.5	2	< .0001
not admitted from home	37.9 (2,540)	31.1 (2,080)	31.0 (2,080)			
Living arrangements						
lived alone	37.8 (4,790)	31.9 (4,050)	30.4 (3,850)	386.2	4	< .0001
with family	31.7 (4,930)	27.4 (4,270)	40.9 (6,370)			
with others	32.6 (3,450)	33.0 (3,490)	34.4 (3,640)			
Age at first hospitalization						
0 – 14	31.7 (663)	34.5 (723)	33.8 (708)			
15 – 24	30.6 (3,030)	34.3 (3,400)	35.2 (3,490)	287.0	6	< .0001
25 – 44	33.1 (5,490)	31.0 (5,140)	36.0 (5,980)			
45 $\geq$	39.0 (3,980)	24.9 (2,540)	36.1 (3,680)			
Number of prior psychiatric hospitalizations						
none	33.3 (3,850)	28.7 (3,320)	38.0 (4,390)	100.2	6	< .0001
1 – 3	33.9 (4,840)	29.6 (4,220)	36.6 (5,230)			
4 – 5	35.2 (1,830)	31.7 (1,650)	33.2 (1,730)			
6 $\geq$	34.1 (2,660)	33.6 (2,620)	32,3 (2,520)			
Medication refusal in last 3 days						
yes				137.5	2	< .0001
no	27.3 (1,340)	36.4 (1,780)	36.4 (1,780)			
	34.9 (11,830)	29.5 (10,023)	35.6 (12,070)			
Poor self-rated physical health						
yes	29.8 (2,900)	31.0 (3,010)	39.3 (3,820)	113.3	2	< .0001
no	35.3 (10,270)	30.2 (8,790)	34.5 (10,030)			
Trauma CAP						
no	40.3 (10,500)	26.9 (7,010)	32.7 (8,520)	1714.3	4	< .0001
level 1 (history of trauma)	25.8 (2.010)	33.5 (2,610)	40.7 (3,180)			
level 2 (abuse last 7 days)	13.2 (661)	43.6 (2,180)	43.2 (2,170)			
Baseline DRS score:						
3 – 5	36.0 (8,300)	30.3 (6,980)	33.7 (7,770)	137.0	2	< .0001
6 $\geq$	30.8 (4,870)	30.6 (4,820)	38.6 (6,090)			

5.2.2 Social Relationships CAP and patient's length of stay

Table 11 presents a comparison of mean length of stay of patients in the full sample and the sub-sample by how frequently they trigger the levels of the Social Relationships CAP. The patients in the full sample have a longer mean length of stay compared to the subsample in all three levels of the CAP. Surprisingly, the patients that did not have problems regarding social relationships had the longest stay of 27.8 day (std. 65.6) on average; however this group includes forensic patients who have long involuntary stays but are less likely to trigger the CAP.

Table 11   Mean Length of Stay by Social Relationships CAP triggering levels

	Triggering levels		
	0	**1**	**2**
	days (std)	**days (std)**	**days (std)**
Sample (n = 125,120)	27,8 (65.6)	23,5 (50.0)	26,7 (55.3)
Sub-sample (n = 38,823)	20,7 (37.6)	18,4 (31.5)	21,7 (32.1)

Table 12 presents the sub-sample's Social Relationships CAPs by length of stay in psychiatric facility. Those patients that had the longest in-patient time (61 days or longer) did trigger level 2 Social Relationships CAP, of both family issues and social isolation, most frequently (40.5% compared to 34.2% of those who had the shortest stay of 10 days or less). However, short stay patients triggered level 1 more frequently (32.1% compared to 23.8% of those with the longest stay), indicating more family relationships problems for those who had shorter stay.

Table 12   **Prevalence of Social Relationships CAP triggering by length of stay**

Length of stay (days)	Triggering levels			Chi-square	df	p
	0 % (n)	1 % (n)	2 % (n)	χ^2		value
0 – 10 days	33.7 (6,060)	32.1 (5,770)	34.2 (6,140)			
11 – 30 days	34.1 (4,810)	30.2 (4,260)	35.8 (5,050)	102.5	6	< .0001
31 – 60 days	33.4 (1,550)	27.5 (1,280)	39.2 (1,820)			
61 ≥ days	35.7 (739)	23.8 (493)	40.5 (838)			

5.2.3 Social Relationships CAP and patient's psychiatric diagnosis

When comparing psychiatric diagnosis (primary, secondary and tertiary) and presence of difficulties in social relationships (Table 13), patients with cognitive disorder were the least likely to exhibit problems in this area, where 41.3% did not trigger the CAP. Patients with adjustment disorders, substance-related disorders and personality disorders triggered level 1 and level 2 of the CAP more frequently than patients with other diagnoses. There are some considerable differences between the distributions within the three levels of the CAP. For example, only 20.9% of patient with cognitive disorders triggered level 1 of the CAP but 37.8% trigger level 2 indicating more social isolation. The prevalence of level 2 in the Social Relationship CAP was highest in patients with eating disorders and adjustment disorders, 42.2% and 40.2, respectively. All findings were significant (p = < .0001).

Table 13   Prevalence of Social Relationships CAP triggering by psychiatric diagnosis

	Triggering levels			Chi-square	df	p
	0	1	2			
	% (n)	% (n)	% (n)	χ^2		value
Mood disorders	33.9 (13,170)	30.4 (11,800)	35.7 (13,860)	-	-	-
Cognitive disorders	41.3 (528)	20.9 (267)	37.8 (484)	62.3	2	< .0001
Substance-related disorders	26.2 (1,990)	37.4 (2,850)	36.5 (2,780)	321.3	2	< .0001
Schizophrenia	36.7 (1,250)	30.6 (1,050)	32.8 (1,120)	17.3	2	< .0001
Anxiety disorders	33.6 (2,090)	27.5 (1,710)	38.9 (2,420)	41.9	2	< .0001
Eating disorders	28.0 (169)	29.8 (180)	42.2 (255)	13.8	2	0.0010
Adjustment disorders	25.5 (369)	34.3 (496)	40.2 (582)	47.5	2	< .0001
Personality disorders	27.7 (1,410)	36.7 (1,870)	35.6 (1,810)	143.7	2	< .0001

5.2.4 Social Relationships CAP and RAI-MH outcome scales

Table 14 provides the distribution of the Social Relationships CAP three triggering levels by ten

embedded RAI-MH outcomes scales. All differences were found to be significant (p < .0001).

Social Relationships CAP triggering levels by patient's functional characteristics

Patients with a Cognitive Performance Scale (CPS) score of 3 or more triggered level 2,

problems related to both social isolation and family functioning, significantly (p < .0001) more

frequently than those with no cognitive impairment (40.2% and 35.3%, respectively). However,

those with highest CPS scores (3 – 6) had less problems within the family than those with no

cognitive impairment. This is consistent with the distribution of triggering levels for patients

with cognitive disorder diagnosis (see Table 13). However, level 2 triggering showed

significantly higher prevalence of problems of both family relationships and social isolation than

for those cognitively intact (40.2% and 35.3%, respectively).

With respect to ADL-hierarchy scores, there were more problems in family relationships

alone among those who were more independent (31.1 % of independent patients trigger level 1

of family issues compared with 22.1% of the most dependent ones). However, the patients with

more ADL assistance needs triggered level 2 significantly more often than independent patients

(39.0% and 35.4%, respectively), indicating more social isolation.

The Self Care Index (SCI) reflects the person's inability to care for self due to psychiatric

disorder. Patients with full ability to care for self were more likely not to trigger the CAP

(37.2%) compared to those with severe (SCI = 5-6) impairment (29.2%). Patients with higher

SCI scores (moderate – severe) were more likely to trigger level 2 compared to patients with no

impairment (40% vs. 27.8%). When considering level 1, no impairment was associated with

more family issues than with those with the highest SCI scores (5-6), 35.0% and 30.9%, respectively. The distributions of SCI triggering rates were similar with both CPS and ADL hierarchy triggering rates.

Social Relationships CAP triggering levels by patient's clinical characteristics

Patients with no potential substance abuse problems, according to the CAGE substance use screener, were more likely not to have social relationships problems compared with those who did have addiction problems (36.9% versus 29.2%). Higher scores on the CAGE scale contributed to higher triggering rates especially regarding problems in family relationships where 27.9% of those without addiction problems did trigger problems with family but 40.1% of those with the highest (3-4) CAGE scores. These findings are congruent with the findings on substance-related disorders CAP triggering distribution (see Table 13).

The distribution of triggering levels for patients with positive symptoms (PSS-long form), measuring psychotic symptoms, showed somewhat more problems in family relationships compared to those without presence of psychotic symptoms (33.1% versus 28.4%). However, the presence of psychotic symptoms did not seem to contribute to feelings of isolation, since depressed patients without psychotic symptoms did trigger level 2 (family issues and isolation) more often (36.2%) than patient experiencing depression with psychotic symptoms (34.5%).

Patients with more mania symptoms were less likely to not trigger the Social Relationships CAP than those without mania symptoms (29.8% vs. 38.8, $p < .0001$). However, problems within the family (level 1) were more frequent for patient with more mania symptoms compared to those with no mania symptoms (34.8% vs. 26.1%, $p < .0001$). Those patients with

mild mania symptoms (1-2) triggered level 2 most frequently. No difference was between patients with no mania symptoms and those with them considering level 2.

Patients experiencing pain within last 3 days were more likely to present problems in social relationships compared to patients that did not experienced pain (35.4% of those without pain did not trigger Social Relationship and 30.8% of those experiencing pain). Though the overall distribution of triggering levels was different the difference was small.

Social Relationships CAP triggering levels by patient's behavioral characteristics

Aggressive behaviour, measured with Aggressive Behaviour Scale (ABS), significantly increases the prevalence of Social Relationships CAP. This was especially true for level 1 (family issues) where 40.1% of patients with severe aggressive behaviour triggered level 1 compared with 28.3 % of those with no signs of aggression. Little difference was evident between the three groups considering level 2 of the CAP.

The Severity of Self-harm scale (SOS) reflects the patient's risk of harm him/her self. With increasing SOS scores the likelihood of problems in social relationships increases, where 43.9% of patients which were considered to have no risk of harming them self did not trigger the Social Relationships CAP but 28.1% of those with highest SOS scores (5 - 6). Increased severity of self-harm was related to higher rates of developing problems related to both isolation and family (level 2), where 28.5% patients with zero SOS scores did trigger level 2, but 38.5% of those with highest scores.

Patients that were considered at severe risk of harming others were more likely to trigger all levels of the Social Relationships CAP than those at no risk, where 42.0% of those at no risk of harming others did not trigger the Social Relationships CAP but 23.9% of those at severe risk.

Overall, problems with family relationships were more prevalent among depressed patients with aggressive and addictive behaviours. Patients who were more functionally impaired (higher CPS, ADL-H, and SCI scores) more frequently triggered level 2 with a combination of family issues and social isolation.

5.2.5 Social Relationships CAP and interventions

Table 15 presents the prevalence of the Social Relationships CAP triggering levels by four different interventions. Patients that had received individual therapy in the last 3 days were significantly more likely to trigger level 2 than those who did not receive that kind of therapy (37.3 % vs. 32.4%). Those patients that received family/couples therapies were significantly more likely to trigger level 2 than other patients not receiving this therapy (44.8% compared to 35.1%). Significant but small differences were found between those who received treatments in group setting or in self-help groups.

5.2.6 Changes in prevalence of Social Relationships CAP by time

Table 16 presents changes in triggering rates of Social Relationships CAP during in-patient period. About 70% of patients that triggered level 1 showed no improvement during in-patient time. Patients that triggered level 2, of both family relationships difficulties and social isolation, showed more improvements at discharge though a majority of them still triggered level (39.4%).

Table 14   RAI-MH outcome scales by Social Relationships CAP triggering levels

	Triggering levels			Chi-square	df	p-value
	% (n)	% (n)	% (n)	value χ^2		
	0	1	2			
CPS						
cognitively intact (0)	35.3 (9,070)	30.7 (7,840)	34.0 (8,740)	125.7	4	< .0001
mild impairment (1-2)	30.6 (3,220)	30.8 (3,240)	38.6 (4,070)			
moderate/severe impairment (3-6)	33.6 (881)	26.2 (686)	40.2 (1,050)			
ADL hierarchy						
independent (0)	33.8 (11,270)	31.1 (10,370)	35.4 (11,720)	87.0	4	< .0001
limited impairment (1-2)	32.6 (1,180)	28.4 (1,030)	39.0 (1,420)			
dependent(3-6)	38.9 (716)	22.1 (407)	39.0 (719)			
SCI						
full ability (0)	37.2 (3,330)	35.0 (3,130)	27.8 (2,490)	366.9	6	< .0001
mild impairment (1-2)	34.1 (6,720)	28.9 (5,690)	37.0 (7,290)			
moderate impairment (3-4)	31.2 (2,240)	28.6 (2,050)	40.2 (2,870)			
severe impairment (5-6)	29.2 (880)	30.9 (930)	39.9 (1,200)			
CAGE						
no problem with addiction(0)	36.9 (11,110)	27.9 (8,400)	35.2 (10,570)	669,7	4	< .0001
some problems (1-2)	26.5 (1,080)	37.6 (1,530)	35.9 (1,460)			
severe problems (3-4)	21.1 (980)	40.1 (1,880)	38.9 (1,820)			
PSS long form						
no psychotic symptoms (0)	35.4 (6,520)	28.4 (5,240)	36.2 (6,660)	95.9	4	< .0001
low level psychotic symptoms (1-2)	33.2 (1,720)	29.4 (1,520)	37.4 (1,930)			
high level psychotic symptoms (3-24)	32.4 (4,930)	33.1 (5,040)	34.5 (5,260)			

CPS-Cognitive Performance Scale; ADL-Activities of Daily Living; SCI-Self-Care Index; PSS-Positive Symptoms Scale

Table 14 **RAI-MH outcome scales by Social Relationships CAP triggering levels cont'**

	Triggering levels			Chi-square	df	p
	0	1	2	χ^2		value
	% (n)	% (n)	% (n)			
MANIA						
no symptoms (0)	38.8 (5,690)	26.1 (3,830)	35.1 (5,140)	404.4	4	< .0001
some symptoms (1-2)	33.8 (2,410)	28.6 (2,040)	37.6 (2,680)			
moderate/severe symptoms (3-20)	29.8 (5,070)	34.8 (5,930)	35.4 (6,030)			
PAIN						
no pain (0)	35.4 (9,380)	29.8 (7,890)	34.9 (9,250)	47.2	2	<.0001
pain (1-4)	30.8 (3,790)	31.8 (3,910)	37.4 (4,610)			
ABS						
no signs of aggression (0)	36.0 (10,420)	28.3 (8,200)	35.7 (10,320)			
mild/moderate aggression (1-4)	28.3 (1,860)	34.5 (2,260)	37.1 (2,430)	338.3	4	< .0001
severe aggression (5-12)	26.8 (895)	40.1 (1,340)	33.0 (1,100)			
SOS						
no risk of self-harm (0)	43.9 (2,810)	27.6 (1,770)	28.5 (1,830)			
some risk of self-harm (1-2)	36.7 (4,230)	29.8 (3,430)	33.5 (3,860)	599.5	6	< .0001
moderate risk of self-harm (3-4)	31.0 (2,630)	29.0 (2,470)	40.0 (3,400)			
severe risk of self-harm (5-6)	28.1 (3,490)	33.4 (4,140)	38.5 (4,770)			
RHO						
no risk of harm to others (0)	42.0 (3,670)	26.6 (2,320)	31.4 (2,740)			
some risk of harm to others (1-2)	34.4 (6,710)	28.4 (5,550)	37.2 (7,260)	660.6	6	< .0001
moderate risk of harm to others (3-4)	37.7 (1,910)	35.5 (2,440)	36.8 (2,530)			
severe risk of harm to others (5-6)	23.9 (886)	40.3 (1,490)	35.8 (1,330)			

ABS-Aggressive Behaviour Scale; SoS-Severity of Self-Harm Scale; RHO-Risk of Harm to Others

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Table 15   **Prevalence of Social Relationships CAP triggering by interventions**

	Triggering levels 0 % (n)	1 % (n)	2 % (n)	Chi-square χ^2	df	p value
Individual therapy						
yes	31.9 (8,280)	30.8 (8,020)	37.3 (9,710)	163.0	2	< .0001
no	38.1 (4,880)	29.5 (3,780)	32.4 (4,150)			
Group therapy						
yes	33.3 (4,300)	29.9 (3,860)	36.8 (4,750)	10.5	2	.005
no	34.2 (8,870)	30.6 (7,940)	35.1 (9,100)			
Family/couples therapy						
yes	24.9 (622)	30.4 (761)	44.8 (1,120)	126.3	2	< .0001
no	34.5 (12,550)	30.4 (11,040)	35.1 (12,740)			
Self-help groups						
yes	29.5 (867)	33.9 (996)	36.6 (1,070)	31.7	2	< .0001
no	34.3 (12,300)	30.1 (10,810)	35.6 (12,780)			

Table 16   **Changes in prevalence of Social Relationships CAP triggering levels by time**

	Social Relationship CAP at baseline					
	Triggering Levels					
	Not triggered % (n)	**Level 1 % (n)**	**Level 2 % (n)**	**Chi-square χ^2**	**df**	**p value**
Social Relationships CAP at time 2						
Not triggered	89.7 (11,810)	21.1 (2,490)	23.0 (3,190)	21080.2	4	< .0001
Level 1	6.6 (868)	69.8 (8,240)	37.6 (5,210)			
Level 2	3.7 (487)	9.1 (1,080)	39.4 (5,460)			

5.2.6 Changes in depressive symptoms by patient's characteristics

The mean baseline and discharge DRS scores were calculated for both full sample and sub-sample excluding those with missing values of discharge dates (see Table 17). The mean Depression Rating Scale (DRS) score for the full sample was 3.2 (std. 2.7) at baseline (at admission) but 1.5 (std. 2.1) at discharge. The baseline DRS score for the sub-sample was 5.4 (std. 2.3) and 2.1 (std. 2.5) at discharge. A DRS score of 3 and more suggests potential clinical depression and DRS 6 or more indicates severe depressive symptoms.

Table 17   Depression Rating Scale (DRS) mean change

	Sample n = 125,120 mean (std)	Sub-sample n = 38,823 mean (std)
DRS score at baseline	3.2 (2.7)	5.4 (2.3)
DRS score at discharge	1.5 (2.1)	2.1 (2.5)

The difference between baseline DRS scores and DRS scores at discharge were calculated and re-coded as: an improvement of 2 or more points, improvement by 1 point, no change, decline by 1 point, and decline by 2 or more point (see Table 18). This was done for both the full sample and sub-sample. The majority of patients in both samples showed improvement in depressive symptoms of 2 or more points, 52.7% for the full sample and 76.8% for the sub-sample. Patients in the sub-sample showed more overall improvement. The portion of patients in the full sample that showed little or no improvement was 47.3%, but 23.2% for the sub-sample

Table 18 also presents changes in depressive symptoms over time. Improvement rates were calculated as: Improvement of 2 DRS scores or more within last 30 days (rapid improvement), improvement of 2 or more DRS scores in 30 days or longer; and improvement of 1 point or less. Patients in the sub-sample improve more rapidly than patients in the full sample (62.5% vs. 42.3%).

Table 18　　Depression Rating Scale (DRS) at admission and discharge

	Sample (n = 125,120) % (n)	Sub-sample (n = 38,823) % (n)
DRS difference		
Improvement ≤ 2	52.7 (65,900)	76.8 (29,800)
Improvement = 1	12.7 (15,940)	7.0 (2,720)
No change	25.3 (31,610)	11.0 (4,270)
Decline = 1 point	4.2 (5,270)	2.4 (925)
Decline ≤ 2 points	5.1 (6,400)	2.8 (1,100)
DRS improvement by time		
Improvement ≤ 2 < 30 days (rapid)	42.3(52,980)	62.5 (24,270)
Improvement ≤ 2 > 30 days	10.3 (12,920)	14.2 (5,530)
No/≤ 1 improvement	47.3 (52,980)	23.2 (9,020)

Table 19 summarizes the changes in depressive symptoms during the in-patient's episode by patient characteristics. Improvements in DRS scores and timeframe are the same as in Table 18.

Men were more likely to improve rapidly than women (64.5% vs. 61.4% (p< .0001)) and married patients did improve slightly but significantly faster than unmarried (63.3% vs. 62.1% (p< .0001)). Patients in the 18 – 25 year old age-group showed more improvement in 30 days than any other age group (68.0%) and patient 65 years and older were more likely to not improve or improve in more than 30 days. Patients of aboriginal origin had a significantly increased likelihood of rapid improvements compared with other patients (67.0 vs. 62.4; p< .0001) and those who were employed at the time of admission showed more rapid improvement of depressive symptoms at the time of discharge than those who did not work (67.0% vs. 61.1%).

Patients receiving disability insurance were both less likely to show any improvement than those with other sources of income (26.4% vs. 22.5%) and, when they did improve, the improvement took longer time. Patients that lived in a private home at the time of admission were significantly more likely to improve faster than those who did have other living arrangements (63.5% and 58.0% respectively) and living with family was associated with both a greater likelihood and faster rate of improvement than those who lived alone or with other than family.

Patients admitted to acute units were most likely to have less depressive symptoms in 30 days than patients in other type of units (addiction, forensic, long-term, and psychiatric crisis units). The patient group that showed least improvement were patients in forensic unit, where 28.7% did not improve. Long-term patients showed improvements in depressive symptoms, but over longer period of time than other groups (20.8% improve within 30 days but 58.2% improved after 30 days or more). Length of stay is a factor that one should take under consideration since the time frame between assessments is the date of admission to date of discharge and patients in acute units have shorter length of stay than other patients groups so they are more likely to be re-assessed sooner than other patients, therefore showing more rapid improvement (see Table 19).

When mental health service history was analysed, it showed that both younger age at first hospitalization and higher number of prior hospitalization where significantly associated with poorer outcome. Patients who were very young (0 – 14 year) at first admission were more likely to show no improvement compared with those who were oldest (45 years and older) (26.9% vs. 22.5%); however, when improved they improved, it was at a faster rate (62.5% vs. 59.4%). Those patients who were admitted for the first time were more likely to improve faster than those

who had 6 or more prior hospitalizations (68.0% and 57.6% respectively). Overall, as the number of admissions increases improvement rates decrease.

Patients that had refused to take prescribed medication were less likely to show improvement in depressive symptoms with 30 days (58.7% vs. 63.1%), but no difference was between those groups regarding if they showed any improvement. Poor self-rated physical health was associated with poorer outcomes were patients with physical health problems were less likely to improve within 30 days (57.5% vs. 64.2%). History of trauma was associated with increased likelihood of not showing improvement of depressive symptoms where those abused in last 7 days did 25.4% show no improvement compared to 22.6% of those patients with no history of trauma.

Table 19 **Changes in depressive symptoms by patient's characteristics**

	No improvement % (n)	Improvement > 30 days % (n)	Improvement within 30 days % (n)	Chi-square value χ^2	df	p value
Sex						
female	23.6 (5,770)	15.0 (3,680)	61.4 (15,020)	53.1	4	<.0001
male	22.7 (3,250)	12.9 (1,850)	64.5 (9,240)			
Marital status						
married	22.0 (3,120)	14.8 (2,100)	63.3 (9,000)	21.5	2	<.0001
not married	24.0 (5,900)	14.0 (3,430)	62.1 (15,280)			
Age group						
18-25	23.4 (1,050)	8.7 (390)	68.0 (3,060)			
26-44	22.8 (3,350)	11.3 (1,660)	65.9 (9,680)	921.3	6	<.0001
45-64	22.8 (3,350)	14.8 (2,180)	62.4 (9,160)			
65+	25.7 (1,270)	26.3 (1,300)	48.0 (2,380)			
Aboriginal origin						
yes	24.0 (274)	9.0 (103)	67.0 (764)	26.5	2	<.0001
no	23.2 (8,750)	14.4 (5,430)	62.4 (23,510)			
Employment status						
employed	20.5 (1,880)	12.5 (1,150)	67.0 (6,170)	104.5	2	<.0001
not employed	24.1 (7,140)	14.8 (4,380)	61.1 (18,100)			
Source of income						
disability insurance	26.4 (1,870)	17.5 (1,240)	56,1 (3,970)	160.6	2	<.0001
other income	22.5 (7,150)	13.5 (4,290)	64.0 (20,310)			
Residential status						
admitted from home	22.9 (7,350)	13.7 (4,380)	63.5 (20,390)	83.7	2	<.0001
not from home	25.0 (1,670)	17.1 (1,150)	58.0 (3,880)			
Lived with						
alone	24.0 (3,040)	14.4 (1,830)	61.7 (7,820)			
family	21.8 (3,390)	14.3 (2,230)	63.9 (9,950)	33.3	4	<.0001
others	24.5 (2,590)	14.0 (1,480)	61.5 (6,500)			

Table 19   Changes in depressive symptoms by patient's characteristics cont'

	No improvement % (n)	Improvement > 30 days	Improvement within 30 days	Chi-square value χ^2	df	p value
Age at first hospitalization						
0 – 14	26.9 (564)	10.6 (221)	62.5 (1,310)			
15 – 24	24.3 (2,410)	12.6 (1,250)	63.1 (6,260)	207.3	6	< .0001
25 – 44	22.6 (3,750)	13.3 (2,200)	64.2 (10,660)			
45 ≥	22.5 (2,290)	18.2 (1,850)	59.4 (6,050)			
Number of prior hospitalizations						
none	21.0 (2,430)	11.0 (1,270)	68.0 (7,850)			
1 – 3	22.8 (3,260)	14.5 (2,070)	62.7 (8,950)	321.3	6	< .0001
4 – 5	24.7 (1,290)	17.9 (929)	57.4 (2,990)			
6 ≥	26.3 (2,050)	16.1 (1,260)	57.6 (4,490)			
Type of unit						
acute unit	23.5 (8,230)	10.5 (3,660)	66.0 (23,140)			
addiction unit	21.6 (114)	29.9 (158)	48.6 (257)			
forensic unit	28.7 (55)	44.8 (86)	26.6 (51)	4,954.4	8	<.0001
long-term unit	21.0 (533)	58.2 (1,480)	20.8 (530)			
psychiatric crisis unit	14.4 (69)	29.4 (141)	56.3 (270)			
Medication refusal in last 3 days						
Yes	23.5 (1,150)	17.8 (873)	58.7 (2,870)	63.9	2	< .0001
No	23.2 (7,870)	13.7 (4,660)	63.1 (21,400)			
Poor self-rated physical health						
yes	25.2 (2,450)	17.3 (1,690)	57.5 (5,600)	159.7	2	< .0001
no	23.0 (6,570)	13.2 (3,840)	64.2 (18,680)			
Trauma CAP						
no	22.6 (5,890)	14.4 (3,750)	63.0 (16,380)			
level 1 (history of trauma)	23.9 (1,860)	13.3 (1.040)	62.8 (4,900)	29.4	4	<.0001
level 2 (abuse in last 7 days)	25.4 (1,270)	14.8 (741)	59.8 (2,990)			
Baseline DRS score						
3 – 5	28.0 (6,460)	12.7 (2,920)	59.3 (13,660	754.3	2	<.0001
6 - 14	16.2 (2,560)	16.5 (2,610	67.3 (10,610)			

5.2.7   Changes in depressive symptoms by length of stay

A longer at stay in hospital increased significantly the likelihood of improvements of depressive symptoms at discharge (see Table 20). About quarter (24.4%) of the patients that stayed 10 days or shorter showed no improvement, but 19.9% of those who stayed 61 days or longer did not improve.

5.2.8   Changes in depressive symptoms by patients psychiatric diagnosis

Table 21 presents changes in depressive symptoms during in-patient period by primary, secondary and tertiary psychiatric diagnoses in the sub-sample All presented findings showed to be significant (p <.0001).

Having diagnosis of adjustment disorders and substance-related disorders increased significantly the likelihood of rapid improvement compared with those with other diagnosis. Sixty-eight percent of patients with adjustment disorders did improve rapidly and 64.9% of patients with substance-related disorders, compared to 40.2% of patients with cognitive disorders and 44.5% of patients with eating disorders. Having cognitive disorders or eating disorders in addition to mood disorder decreased the likelihood of improvement significantly. Patients with diagnosis of mood disorders and schizophrenia did show better outcome overall, 21.6% did not improve, 20.8% improved after 30 days and 58.6% improved within 30 days. Patients that were diagnosed with personality disorder did have the third highest non-improvement rate or 26.5% but personality disorder was also associated with having the second highest rapid improvement rate hence patients with personality disorder tends to either improve within 30 days or not at all.

Table 20   Length of hospital stay by Depression Rating Scale (DRS) improvement rates

Length of Stay (days)	No improvement % (n)	Improvement > 30 days % (n)	Improvement within 30 days % (n)	Chi-square value χ^2	df	p value
0 – 10 days	24.4 (4,390)	-	75.6 (13,590)			
11 – 30 days	22.7 (3,210)	1.7 (236)	75.6 (10,677)	28899.9	6	<.0001
31 – 60 days	21.7 (1,010)	78.3 (3,630)	-			
61 ≥ days	19.9 (411)	80.1 (1,660)	-			

Table 21   Psychiatric Diagnosis by Depression Rating Scale (DRS) Improvement Rates

	No improvement % (n)	Improvement > 30 days	Improvement within 30 days	Chi-square value χ^2	df	p value
Substance-related disorders	23.9 (1,820)	11.2 (856)	64.9 (4,950)	70.7	2	<.0001
Schizophrenia	21.6 (737)	20.8 (710)	58.6 (1,970)	131.3	2	<.0001
Anxiety disorders	24.9 (1,550)	19.5 (1.210)	55.6 (3,450)	211.3	2	<.0001
Eating disorder	28.8 (174)	26.7 (161)	44.5 (269)	106.4	2	<.0001
Adjustment disorder	23.2 (335)	8.8 (127)	68.1 (985)	38.9	2	<.0001
Personality disorder	26.5 (1,350)	9.8 (499)	63.7 (3,240)	108.0	2	<.0001
Cognitive disorders	28.9 (369)	31.0 (396)	40.2 (514)	383.1	2	<.0001

5.2.9 Changes in depressive symptoms by RAI-MH outcome scales

Table 22 presents the results of analysis of the changes in depressive symptoms by ten embedded RAI-MH outcome scales for the sub-sample for patients with depressive symptoms (DRS≥3) and mood disorder diagnosis. All findings were found to be significant (<.0001).

Changes of depressive symptoms by patients functional characteristics

Patients with cognitive impairment (CPS = 1 - 6) were significantly more likely to not improve compared with cognitively intact patients (25.3% vs. 23.0%). There was a negative linear relationship between severity of cognitive impairment and improvements rate where 65.2% of patients with zero CPS score improved within 30 days, 59.5% of patients with borderline/mild impairment improved within 30 days and 48.2% of patients with moderate/severe impairment improved rapidly.

Decreased ability to perform activities of daily living (measured by ADL-hierarchy scale) decreased the likelihood of a rapid improvement in depressive symptoms. ADL refers to tasks such as personal hygiene, locomotion, toilet use and eating. Dependent patients (ADL-hierarchy = 3-6) improved less rapidly (45.8%) than independent patients and patients who needed limited assistance (64.2% and 55.5%, respectively).

Patients with the highest Self Care Index score, which indicates high risk of an inability to care for self due to psychiatric illness, were less likely to improve within 30 days compared to patients with full ability (58.7% vs. 65.4%). However, when looking at the non-improvement rates it shows that patients with full ability had worse outcomes than patients with higher SCI scores (24.6% vs. 19.7%).

Changes of depressive symptoms by clinical characteristics

Patients with potential severe addiction problems (evaluated by CAGE substance abuse screener) showed higher rapid improvement rates (65.1%) than patients with no CAGE score (61.6%). Overall, patients with some problems with additions (CAGE = 1-2) had better outcomes than those with no addiction problem and those with severe addiction problems. However, about 24.0% of all patients showed no improvement in depressive symptoms during in-patient time.

Patients with higher score on the Positive Symptoms Scale (PSS-long form), which indicates presence of psychotic symptoms, showed more improvement (both within 30 days and after 30 days) in depressive symptoms than those with no or lower PSS scores. The difference was small but significant (p <.0001).

Patients with manic symptoms, in an addition to the depressive symptoms, did show significantly more rapid improvement than those without manic symptoms (63.9% vs. 61.2%). The difference between improvements rates was small but significant (p <.0001).

The prevalence of experienced pain in the last 3 days was 31.7% (n = 12,310) and of those 25.2% did not improve during in-patient period compared with 22.3% of those who did not experience pain. The likelihood of rapid improvement decreased with pain compared with those with no pain, 60.2% and 63.6% respectively.

Changes of depressive symptoms by behavioral characteristics

Patients exhibiting severe aggressive behavior (ABS = 5-12) were significantly less like to have rapid improvement than patients who did not show signs of aggression (59.0% v. 63.1%; p <.0001, respectively). The likelihood of not improving did not differ from the three groups of different ABS scores (≈ 23.0%) . Patients regarded with mild/moderate aggressive behavior

(ABS = 1-4) had similar improvement rates overall as patients that did not show aggressive behavior.

The majority (66.0%) of patients considered with severe risk of self-harm showed improvement in depressive symptoms within 30 days, compared to 61.6% of those who were not at any self-harm risk. However, no difference was evident between improvement rates of these two groups concerning those patients that did not show any improvement (23.5%).

Those patients that were considered to be at no risk of harming others were less likely to show rapid improvement in depressive symptom (61.3% compared to 62.7% of patients at severe risk of harming others). Patients assessed to be at no risk of harming others were more likely to not improve than the three patients groups that were at risk of violence.

Overall, functionally impaired patients exhibit slower improvement rates than other patients, but minor differences were apparent between patients groups concerning non-improvement.

Table 22   Changes in depressive symptoms by RAI-MH outcome scales

	No improvement % (n)	Improvement ≥ 30 days	Improvement within 30 days	Chi-square value χ^2	df	p value
CPS						
cognitively intact (0)	23.0 (5,890)	11.8 (3,030)	65.2 (16,750)	583.0	4	<.0001
mild impairment (1-2)	23.4 (2,460)	17.1 (1,800)	59.5 (6,270)			
moderate/severe impairment (3-6)	25.3 (663)	26.5 (695)	48.2 (1,260)			
ADL hierarchy						
independent (0)	22.9 (7,640)	12.9 (4,300)	64.2 (21,420)	490.8	4	<.0001
limited impairment (1-2)	24.5 (889)	20.0 (724)	55.5 (2,020)			
dependent(3-6)	26.8 (494)	27.4 (505)	45.8 (843)			
SCI						
full ability (0)	24.6 (2,200)	10.0 (898)	65.4 (5,860)	396.7	6	<.0001
mild impairment (1-2)	23.1 (4,540)	13.5 (2,650)	63.5 (12,500)			
moderate impairment (3-4)	23.5 (1,680)	18.5 (1,330)	58.0 (4,150)			
severe impairment (5-6)	19.7 (594)	21.6 (652)	58.7 (1,770)			
CAGE						
no problem with addiction(0)	23.0 (6,910)	15.4 (4,640)	61.6 (18,530)	151.5	4	<.0001
some problems (1-2)	24.0 (977)	9.8 (397)	66.3 (2,700)			
severe problems (3-4)	24.3 (1,140)	10.6 (497)	65.1 (3,040)			
PSS long form						
no psychotic symptoms (0)	24.1 (4,450)	13,7 (2,520)	62.2 (11,460)	86.1	4	<.0001
low level psychotic symptoms (1-2)	25.5 (1,320)	12.0 (623)	62.5 (3,230)			
high level psychotic symptoms (3-24)	21.4 (3,250)	15.7 (2,390)	63.0 (9,580)			

CPS-Cognitive Performance Scale; ADL-Activities of Daily Living; SCI-Self-Care Index; PSS-Positive Symptoms Scale

Table 22   Changes in depressive symptoms by RAI-MH outcome scales cont'

	No improvement % (n)	Improvement > 30 days	Improvement within 30 days	Chi-square value χ^2	df	p value
MANIA						
no symptoms (0)	24.3 (3,560)	14.5 (2,130)	61.2 (8,970)	42.7	4	<.0001
some symptoms (1-2)	24.6 (1,750)	13.4 (955)	62.1 (4,430)			
moderate/severe symptoms (3-20)	21.8 (3,710)	14.4 (2,440)	63.9 (10,880)			
PAIN				47.2	2	<.0001
no pain (0)	22.3 (5,920)	14.1 (3,730)	63.6 (16,870)			
pain (1-4)	25.2 (3,100)	14.6 (1,800)	60.2 (7,410)			
ABS						
no signs of aggression (0)	23.3 (6,740)	13.6 (3,930)	63.1 (18,260)	61.3	4	<.0001
mild/moderate aggression (1-4)	23.2 (1,520)	15.0 (983)	61.8 (4,050)			
severe aggression (5-12)	22.6 (755)	18.4 (614)	59.0 (1,970)			
SOS						
no risk of self-harm (0)	23.5 (1,510)	15.0 (958)	61.6 (3,950)	299.4	6	<.0001
some risk of self-harm (1-2)	24.1 (2,770)	17.7 (2,040)	58.2 (6,700)			
moderate risk of self-harm (3-4)	21.5 (1,830)	14.5 (1,230)	64.0 (5,440)			
severe risk of self-harm (5-6)	23.5 (2,910)	10.5 (1,300)	66.0 (8,190)			
RHO						
no risk of harm to others (0)	25.3 (2,210)	13.4 (1,170)	61.3 (5,350)	39.8	6	<.0001
some risk of harm to others (1-2)	22.6 (4,420)	14.3 (2,790)	63.1 (12,320)			
moderate risk of harm to others (3-4)	22.1 (1,520)	15.5 (1,070)	62.4 (4,290)			
severe risk of harm to others (5-6)	23.7 (877)	13.6 (505)	62.7 (2,320)			

ABS-Aggressive Behaviour Scale; SoS-Severity of Self-Harm Scale; RHO-Risk of Harm to Others

5.2.10 Changes in depressive symptoms and the Social Relationships CAP

Table 23 presents the changes in depressive symptoms and Social Relationships Caps triggering levels. Patients who did not trigger the CAP were significantly less likely to not show improvement of depressive symptoms (22.4%) than those who triggered both level 1 and level 2 (24.4 and 23.0%, respectively). When considering rapid improvement, it shows that patients that did not trigger the Social Relationships CAP and those who triggered level 1 (family issues) had the same likelihood of improving rapidly ($\approx$63%). However, patients that had problems with both family relationships and social isolation were least likely to improve (61.2%). Overall, the difference between these three groups of triggering levels was slight but significant (p <.0001).

5.2.11 Changes in depressive symptoms and interventions

No difference was between the four different treatment modalities and the likelihood of not improving from depressive symptoms (23.0%) (see Table 24). However, receiving individual therapy and/or family/couples therapy significantly increased the likelihood of faster improvement. One patient could have received one or all interventions during in-patient time.

Table 23   Changes in depressive symptoms by Social Relationships CAP triggering levels

Triggering levels	No improvement % (n)	Improvement > 30 days	Improvement within 30 days	Chi-square value χ^2	df	p value
Not triggered	22.4 (2,950)	14.4 (1,890)	63.2 (8,320)			
Level 1	24.4 (2,880)	12.2 (1,440)	63.4 (4,480)	76.3	4	<.0001
Level 2	23.0 (3,190)	15.8 (2,190)	61.2 (8,480)			

Table 24   Changes in depressive symptoms by interventions

Interventions in last 7 days	No improvements	Improvement > 30 days	Improvement within 30 days	Chi-square value χ^2	df	p value
Individual therapy						
yes	23.0 (5,990)	13.0 (3,390)	63.9 (16,630)	107.0	2	< .0001
no	23.6 (3,030)	16.7 (2,140)	59.7 (7,650)			
Group therapy						
yes	23.4 (3,020)	14.5 (1,870)	62.1 (8,020)	1.5	2	0.5
no	23.1 (5,990)	14.1 (3,660)	62.7 (16,260)			
Family/couples therapy						
yes	22.2 (556)	11.1 (278)	66.7 (1,670)	27.1	2	< .0001
no	23.3 (8,460)	14.5 (5,250)	62.2 (22,610)			
Self-help group						
yes	23.4 (686)	15.7 (460)	61.0 (1,790)	5.7	2	0.06
no	23.2 (8,330)	14.1 (5,070)	62.7 (22,480)			

5.3   Multivariate Analysis

Multiple logistic regression was performed to predict the odds of dichotomous outcome of changes in depressive symptoms of a sub-sample of patients with diagnosis of mood disorder and DRS score three or more (n = 38,823). Independent variables were selected by manual procedure on basis of clinical evidence from the literature and the bivariate analysis reported previously. A manual approach to variable selection was employed since automatic procedures (forward, backward and stepwise) can ignore clinical importance and may be affected by collinearity among variables. Adding one variable at time in the model gives the opportunity to assess how each variable effects the logistic regression equation. The odds ratio, 95% CI and c statistics were obtained for the models (see Table 25 and Table 26).

Most of the independent variables considered were collapsed into categorical values with ranges informed by clinical conventions (e.g., the standard cut-off used for DRS is 3+). These categorical variables were then analyzed using the default parameterization approach in SAS' Proc Logistic with the CLASS statement. This approach produces output with conventional odds ratios and confidence limits, but the parameter estimates are based on "effect coding" and cannot be directly exponentiated to obtain the odds ratio (Lewis, 2007).

Two models were identified for changes in depressive symptoms. Model I predicts any improvements in depressive symptoms in all patients in the sub-sample regardless of time, but model II predicts rapid (within 30 days) improvement of depressive symptoms with a denominator based only on those who showed any improvement. The significance level to retain variables in the models was p = 0.05.

5.3.1 Logistic Model I: Predicting improvements of depressive symptoms

The logistic Model I to predict the odds of improvement in depressive symptoms during in-patient time included 17 variables (see Table 25). The c Statistic (concordance) measures the regression model's accuracy of predictions where c is identical to the area under the ROC (receiver operating characteristic) curve. Higher values of c indicate better predictive ability for the event of interest. The c Statistic for model I was 0.62 (Likelihood Ratio = 1276.0, df = 30, p < .0001) which indicates acceptable performance in predicting the outcome of interest.

When adjusting for other variables in the model, patients that triggered Social Relationships CAP have lower odds of improving from depressive symptoms. The presence of Level 1 Social Relationships CAP (family issues) at baseline has an odds ratio of 0.89) and presence of level 2 (family issues and social isolation) has an odds ratio of 0.93 for an improvement of depressive symptoms. Patients that triggered the Trauma CAP also had lower odds of improvement. The presence of Level 1 Trauma CAP (history of trauma) decreased the odds of an improvement of depressive symptoms (OR = 0.92) and presence of level 2 of the Trauma CAP (victim of an abuse in the last 7 days) lowered the odds of improvement further (OR= 0.83).

Longer length of stay at psychiatric facility predicts better outcome and a high DRS score (6 – 14) at baseline, indicating severe depression, increased the odds of an improvement of depressive symptoms by odds ratio of 2.15. Being elderly (65 and older) is associated with poorer outcomes, but older age of first psychiatric hospitalization predicts better outcome compared with patients that were younger at first admission. The odds of an improvement decreases linearly with numbers of lifetime psychiatric hospitalizations where patients that had 6

or more admissions had 0.75 times lower odds of improvement compared with those with no prior psychiatric admissions.

Having disability insurance as a source of income yields a lower the odds of an improvement of depressive symptoms (odds ratio = 0.83), but living with family member increases the odds of an improvement slightly (odds ratio = 1.08) compared to living alone or with other than family. Diagnoses of personality disorders, eating disorders, anxiety disorders, and cognitive disorders as a primary, secondary and/or tertiary diagnosis were all associated with lower odds of an improvement. Other comorbid psychiatric diagnoses were non-significant in the model.

Three RAI-MH outcome scales were significant in model I. Having higher score on Self Care Index (SCI), measuring the ability to care for self due to psychiatric illness, yields an increased odds of showing improvement of depressive symptoms during the in-patient period, where those having the highest score of 5 – 6 had an odds ratio of 1.43 compared with those with no self-care impairment. However, having more severe ADL and cognitive impairments lowers the odds of an improvement of depressive symptoms. Those patients experiencing poor physical health do have lower odds of improving from depressive symptoms compared to those without physical health problems.

A number of alternative potential predictors were explored in the model but did reach the .05 level of significance. Example of those variables were: sex, marital status, employment status, aboriginal origin, schizophrenia, substance-related disorders, medication adherance, history of criminal activity, positive symptoms, mania symptoms, indication of addiction, risk of harming others, self-harm, aggressive behaviour, presence of pain, medication adherence and refusal, and interventions.

5.3.2 Logistic Model II: Predicting rapid improvements of depressive symptoms

Logistic Model II predicts the odds of rapid improvements (within 30 days) included 25 predictor variables (see Table 26) among those who improved at discharge. The c Statistic for the model was 0.70 (likelihood ratio = 2273.0, df 34, p <.0001) which indicates a better fit than the model of any improvement.

The presence of level 1 in the Social Relationships CAP (family issues) at baseline does not predict the probability of a rapid improvement (95% confidence interval overlapped 1.0 thus non-significant finding), but level 2 (family issues and social isolation) do lower the odds of a rapid improvement of depressive symptoms. Level 2 of the clinical assessment protocol Trauma (victim of an abuse in last 7 days) was significant in model II, where those who were currently victims were 0.84 time less likely to improve rapidly from depressive symptoms compared with those who did not have history of trauma. Having a history of trauma (level 1), but not currently abused, does not predict rapid improvements in depressive symptoms.

Women have slightly lower odds of an improvement within 30 days and being elderly (65 and older) lowers the odds of a rapid improvement from depressive symptoms by odds ratio of 0.54. Being married or employed was not significant in the model, but disability insurance as a source of income decreases the odds of improvement by 0.68. Being of aboriginal origin increased the odds of an improvement by odds ratio of 1.46.

Younger age at first psychiatric hospitalization yields higher odds of a rapid improvement, but increased number of lifetime psychiatric admissions decreases the odds of an improvement of depressive symptoms.

Having eating disorder, anxiety disorder or cognitive disorder diagnoses lower the odds

of a rapid improvement (OR= 0.36, 0.59 and 0.62, respectively). However, having a diagnosis of

personality disorder increases the odds of improvement by odds ratio of 1.40.

Seven RAI-MH outcome scales were found significant and included in model II:

Cognitive Performance Scale (CPS), Self Care Index (SCI), ADL hierarchy, Severity of Self-

harm (SOS), Mania Scale and CAGE addiction screener. More impairment in cognition and self

care abilities (CPS, ADL hierarchy and SCI) decrease the odds of rapid improvement of

depressive symptoms by a linear fashion. However, having higher scores on Severity of Self-

harm Scale and Mania scales increased the odds of a rapid improvement (OR=1.62 and 1.20 for

the highest scores of SOS and Mania). The same goes for CAGE addiction screener where the

scores of 1-2, which indicates some concerns of substance use, increase the odds of improvement

of depressive symptoms within 30 days by odds ratio of 1.35.

Patients that had refused to take prescribed medication in the last 3 days have a lower

odds of a positive outcome of depressive symptoms within 30 days (odds ratio = 0.87) . Similar

results were evident for those with a poor self-reported physical (OR=0.84).

When looked at interventions (excluding medication) in the last 7 days, patients receiving

individual and/or family/couples therapy have increased odds of an improvement within 30 days.

However, patients that had received therapy in group settings or in self-help groups had lower

odds of rapid improvement.

Many other predictor candidates of potential interests were considered in the model but

were excluded from the final model because they were non-significant. Example of these

variables were: length of stay, baseline DRS score, marital status, employment status, living

arrangements, residental status, schizophrenia, substance-related disorders, history of criminal activity, positive symptoms, and medication adherence.

There were some differences between the two models other than their size. Patients with personality disorder diagnosis which have a lower odds of an improvement in Model I have higher odds of rapid improvement of depressive symptoms in Model II (odds ratio = 0.85 and 1.40, respectively). On the other hand, higher SCI scores yield higher odds of improvement in Model I but lower odds in Model II (odds ratio 1.42 and 0.63, respectively). Being of older age at first psychiatric hospitalization predict better outcomes in model I but worse outcomes in model II. Overall, model II is more complex than model I but demonstrates more accurate prediction as evidenced by a higher value for the c statistic

Multi-collinearity was evaluated by pairwise Spearman's rank inter-correlations and was conducted for categorical and binary independent variables in the models. When variables showed high correlation (coefficient of 0.5 was determined as priori) a decision was made to which to exclude. The correlation coefficients range from $r = -0.11 - 0.71$ and variables that exceeded the guideline were excluded. Variables that were excluded from the model were: Number of recent psychiatric hospitalizations, time since last discharge, and amount of time hospitalized in the last 2 years.

Interactions were assessed by two-way interactions term evaluating changes in parameter estimate values. Interaction terms were chosen on clinical basis. Two types of interactions were considered: between the Social Relationships CAP and level 2 of Trauma CAP in and between length of stay and DRS score. For clinical relevance Trauma CAP and length of stay were included in the final logistic model but interactions taken into consideration were not significant.

Table 25 **Logistic model to predict odds of improvements of depressive symptoms**

Independent variable	Parameter Estimate (SE)[1]	Odds Ratio (95% CL)	p value
Socrel_CAP (ref. = not triggered)			
Level 1 (family issues)	-.049 (.018)	0.89 (0.84 – 0.95)	.001
Level 2 (family issues and isolation)	-.014 (.017)	0.93 (0.87 – 0.98)	
Trauma_CAP (ref. = not triggered)			
Level 1 (history of abuse)	.005 (.022)	0.92 (0.86 – 0.98)	<.0001
Level 2 (abused in last 7 days)	-.095 (.025)	0.83 (0.77 – 0.89)	
Length of Stay (ref. = 0 – 10 days)			
11 – 30 days	-.095 (.023)	1.10 (1.04 – 1.16)	<.0001
31 – 60 days	.044 (.031)	1.26 (1.16 – 1.37)	
61 ≥ days	.240 (.044)	1.53 (1.36 – 1.73)	
High (6 ≥) baseline DRS (ref. DRS = 3 – 5)	.382 (.014)	2.15 (2.04 – 2.6)	<.0001
Elderly (ref. = no)	-.253 (.044)	0.78 (0.71 – 0.85)	<.0001
Age at first hospitalization (ref. = 0-14)			
15 – 24 years old	.025 (.025)	1.22 (1.09 – 1.37)	
25 – 44 years old	.072 (.021)	1.28 (1.15 - 1.43)	<.0001
45 ≥ years old	.079 (.026)	1.29 (1.15 – 1.47)	
Lifetime psychiatric admissions (ref.=none)			
1 – 3	.032 (.095)	0.88 (0.83 – 0.94)	<.0001
4 - 5	-.057 (.027)	0.81 (0.75 – 0.88)	
6 or more	-.130 (.023)	0.75 (0.70 – 0.81)	
On disability insurance (ref. = no)	-.193 (.032)	0.83 (0.78 – 0.88)	<.0001
Living arrangements (ref. = lived alone)			
Lived with family	.062 (.017)	1.08 (1.02 – 1.46)	<.0001
Lived with others	-.046 (.019)	0.97 (0.91 – 1.03)	

c Statistic = 0.62; Likelihood Ratio = 1276.0, df = 30, p < .0001

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[1] In this and subsequent logistic regression tables, the parameter estimates reflect SAS output for effects coding when using the CLASS statement. These estimates cannot be directly exponentiated to obtain odds ratios as could be done with dummy variables. The reported p values reflect tests of significance for the overall variable rather than individual response levels for the independent variable.

Table 25 Logistic model to predict odds of improvements in depressive symptoms cont'

Independent variable	Parameter Estimate (SE)	Odds Ratio (95% CL)	p value
Personality Disorder (ref. = no)	-.165 (.036)	0.85 (0.79 – 0.91)	<.0001
Eating Disorder (ref. = no)	-.277 (.093)	0.76 (0.63 – 0.91)	.003
Anxiety Disorder (ref. = no)	-.164 (.033)	0.85 (0.80 – 0.91)	<.0001
Cognitive Disorder (ref. = no)	-.233 (.071)	0.79 (0.69 – 0.91)	.001
Self Care Index (SCI) (ref. = 0)			
mild (1 – 2)	-.092 (.024)	1.03 (0.97 – 1.09)	<.0001
moderate (3 – 4)	-.016 (.029)	1.11 (1.01 – 1.22)	
severe (5 – 6)	.228 (.042)	1.42 (1.25 – 1.61)	
ADL hierarchy (ref. = independent)			
limited impairment (1 – 2)	-.008 (.033)	0.91 (0.83 – 0.99)	.04
dependent (3 – 6)	-.076 (.042)	0.83 (0.73 – 0.95)	
Cognitive Performance Scale (CPS) (ref. = cognitively intact)			
mild impairment (1 - 2)	.015 (.025)	0.90 (0.84 – 0.97)	.0004
moderate/severe impairment (3 – 6)	-.133 (.039)	0.78 (0.69 – 0.89)	
Poor self rated health (ref. = no)	-.173 (.029)	0.84 (0.79 - 0.89)	.001

c Statistic = 0.62; Likelihood Ratio = 1276.0, df = 30, p < .0001

Table 26   **Logistic model II to predict rapid improvement of depressive symptoms**

Independent variable	Parameter Estimate (SE)	Odds Ratio (95% CL)	p value
Socrel_CAP (ref. = not triggered)			
Level 1 (family issues)	.071 (.024)	1.00 (0.92 – 1.08)	<.0001
Level 2 (family issues and isolation)	-.144 (.022)	0.81 (0.75 – 0.87)	
Trauma_CAP (ref. = not triggered)			
Level 1 (history of abuse)	.060 (.028)	1.00 (0.93 – 1.09)	.002
Level 2 (abuse within last 7 days)	-.117 (.032)	0.84 (0.77 – 0.92)	
Female	-.066 (.034)	0.94 (0.87 – 1.00)	.05
Elderly (ref. = 18 – 64 years)	-.719 (.047)	0.49 (0.45 – 0.53)	<.0001
Aboriginal origin (ref. = no)	.379 (.109)	1.46 (1.18 – 1.81)	.0005
Age at first hospitalization (ref. = 0 - 14)			
15 – 24 years old	.030 (.034)	0.91 (0.78 – 1.07)	
25 – 44 years old	.001 (.029)	0.89 (0.76 – 1.04)	<.0001
≥45 years old	-.152 (.034)	0.76 (0.65 – 0.90)	
Lifetime psychiatric admissions (ref. = none)			
1 – 3	.007 (.025)	0.68 (0.62 – 0.73)	<.0001
4 - 5	-.248 (.032)	0.52 (0.47 – 0.58)	
6 or more	-.157 (.029)	0.57 (0.52 – 0.63)	
Disability insurance (ref. = no)	-.390 (.040)	0.68 (0.63 – 0.73)	<.0001
Personality Disorder (ref. = no)	.336 (.054)	1.40 (1.26 – 1.55)	<.0001
Eating Disorder (ref. = no)	-1.04 (.108)	0.36 (0.29 – 0.44)	<.0001
Anxiety Disorder (ref. = no)	-.537 (.040)	0.59 (0.54 – 0.63)	<.0001
Cognitive Disorder (ref. = no)	-.471 (.080)	0.62 (0.53 – 0.73)	<.0001
Cognitive Performance Scale (ref. = 0)			
mild impairment (1 - 2)	.058 (.029)	0.84 (0.76 – 0.93)	<.0001
moderate/severe impairment (3–6)	-.290 (.045)	0.59 (0.51 – 0.68)	

c Statistic = 0.70; Likelihood Ratio = 2,273.0 df = 34, p < .0001

Table 26   Logistic model II to predict rapid improvement of depressive symptoms cont'

Independent variable	Parameter Estimate (SE)	Odds Ratio (95% CL)	p value
Self Care Index (SCI) (ref. = 0)			
mild (1 – 2)	-.103 (.028)	0.75 (0.69 – 0.82)	
moderate (3 – 4)	-.053 (.029)	0.70 (0.62 – 0.80)	<.0001
severe (5 – 6)	-.257 (.028)	0.63 (0.54 – 0.74)	
ADL hierarchy (ref. = independent)			
limited impairment (1 – 2)	.-.013 (.037)	0.85 (0.77 – 0.95)	<.0001
dependent (3 – 6)	-.132 (.047)	0.76 (0.66 – 0.88)	
Severity of Self-harm (SOS) (ref. = 0)			
mild (1 – 2)	-.103 (.027)	1.11 (1.00 – 1.23)	<.0001
moderate (3 – 4)	.053(.029)	1.30 (1.17 – 1.44)	
severe (5 – 6)	.257 (.028)	1.59 (1.44 – 1.76)	
Addiction Scale (CAGE) (ref. = 0)			
some concerns (1 – 2)	.134 (.041)	1.35 (1.21 – 1.52)	<.0001
severe concerns (3 – 6)	.034 (.039)	1.22 (1.10 – 1.36)	
Mania (ref. = 0)			
some symptoms (1 – 2)	-.015 (.028)	1.08 (0.99 – 1.18)	<.0001
moderate/severe symptoms (3 – 20)	.107 (.023)	1.22 (1.14 – 1.31)	
Medication refusal (ref.= no)	-.137 (.046)	0.87 (0.80 – 0.96)	.003
Poor self rated health (ref. = no)	-.176 (.036)	0.84 (0.78 – 0.90)	.002
Individual therapy (ref. = no)	.300 (.034)	1.35 (1.26 – 1.44)	<.0001
Group therapy (ref. = no)	-.194 (.037)	0.82 (0.77 – 0.89)	<.0001
Family/couples therapy (ref. = no)	.417 (.071)	1.52 (1.32 – 1.74)	<.0001
Self-help group (ref. = no)	-.208 (.060)	0.81 (0.72 – 0.91)	.0005

c Statistic = 0.70; Likelihood Ratio = 2,273.0 df = 34, p < .0001

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Figure 2   **Predictors of lower odds of an improvement of depressive symptoms**
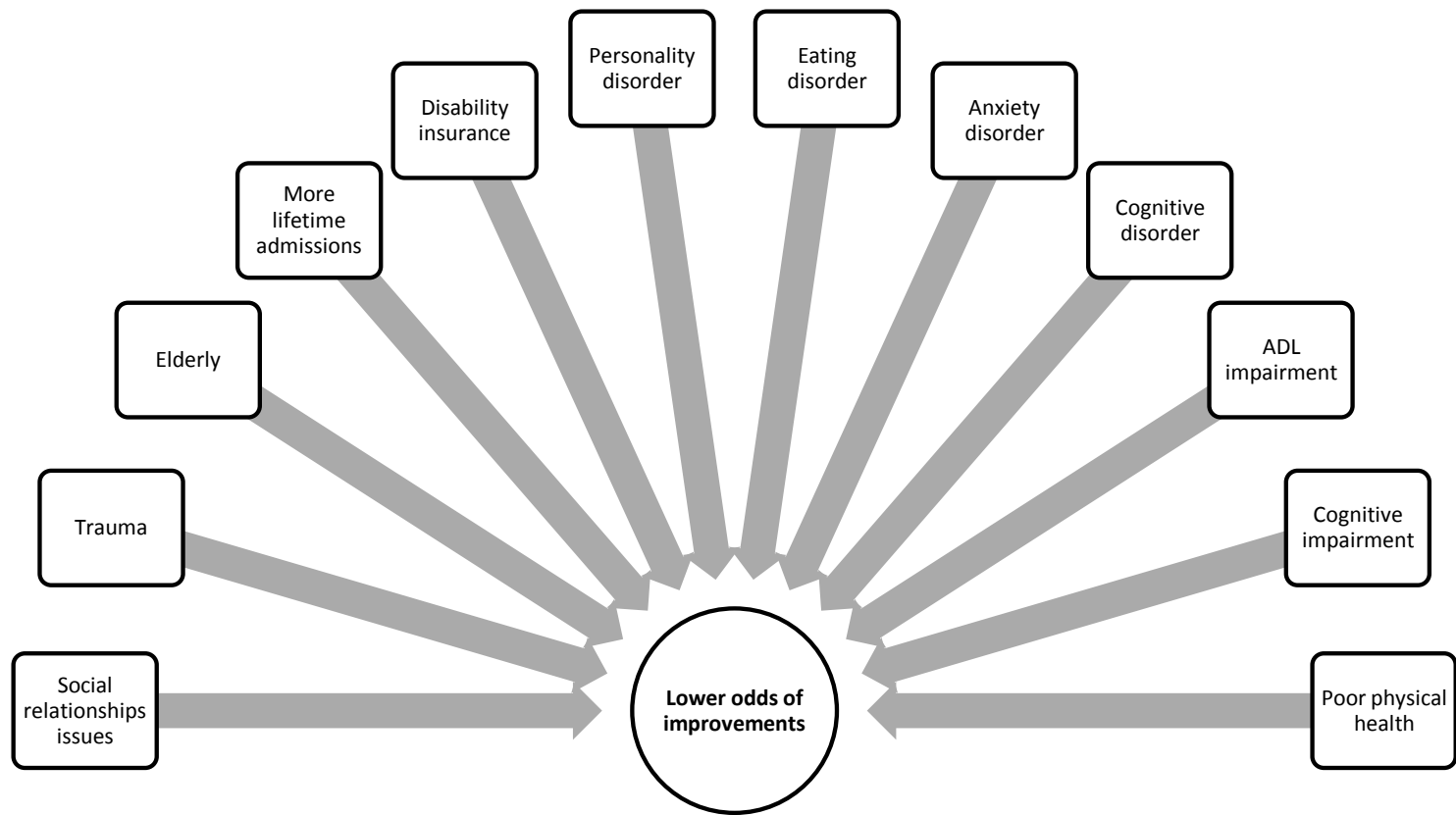
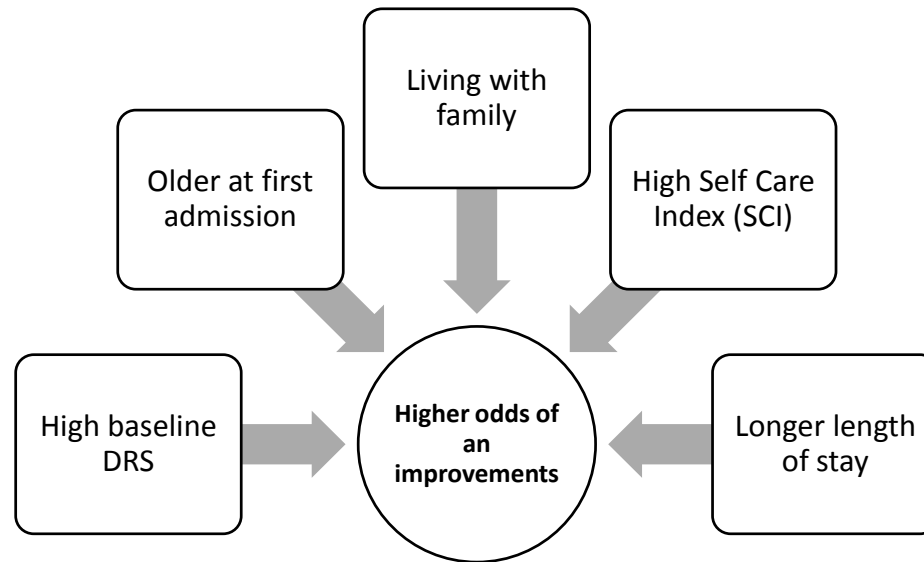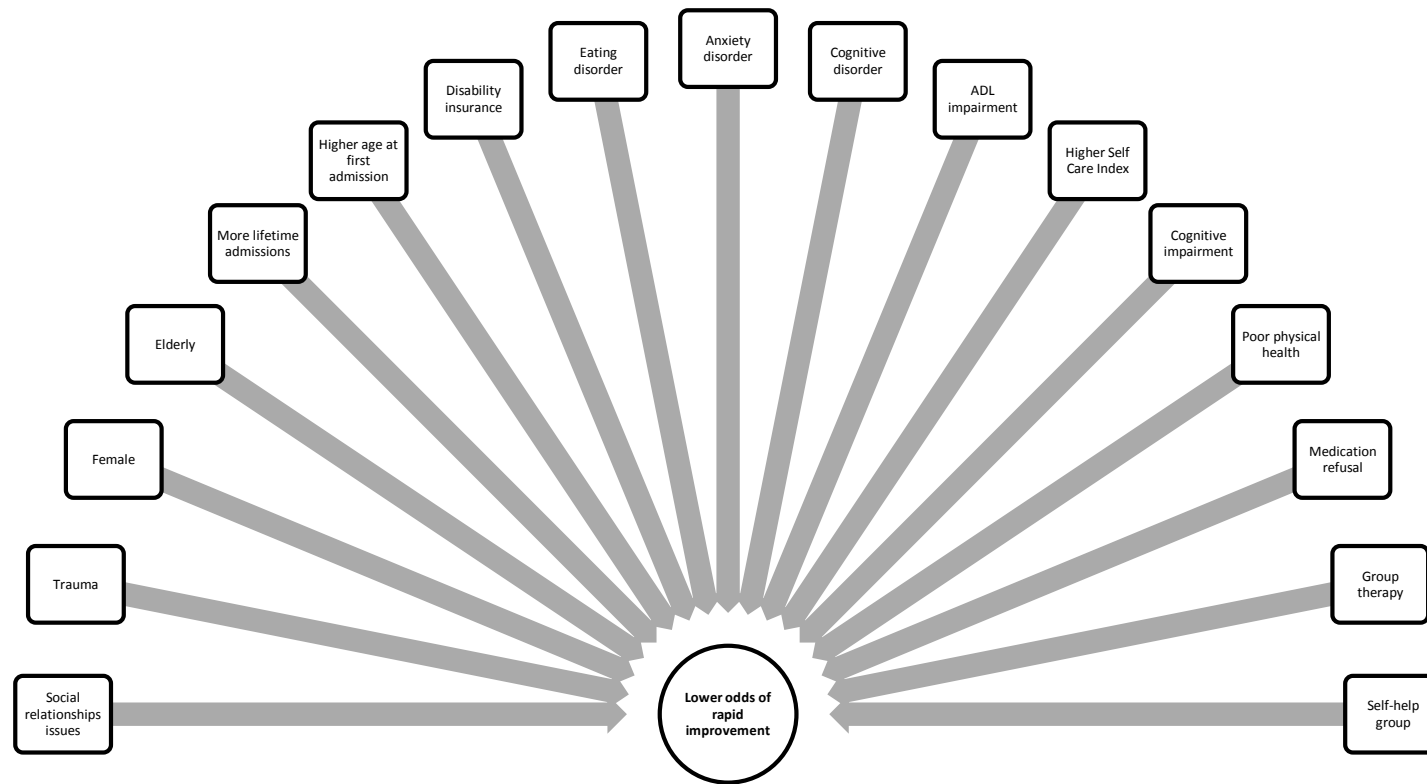**Figure 3   Predictors of higher odds of an improvement of depressive symptoms**

Figure 4   Predictors of lower odds of rapid[2] improvements of depressive symptoms

Figure 5   **Predictors of higher odds of rapid improvement of depressive symptoms**

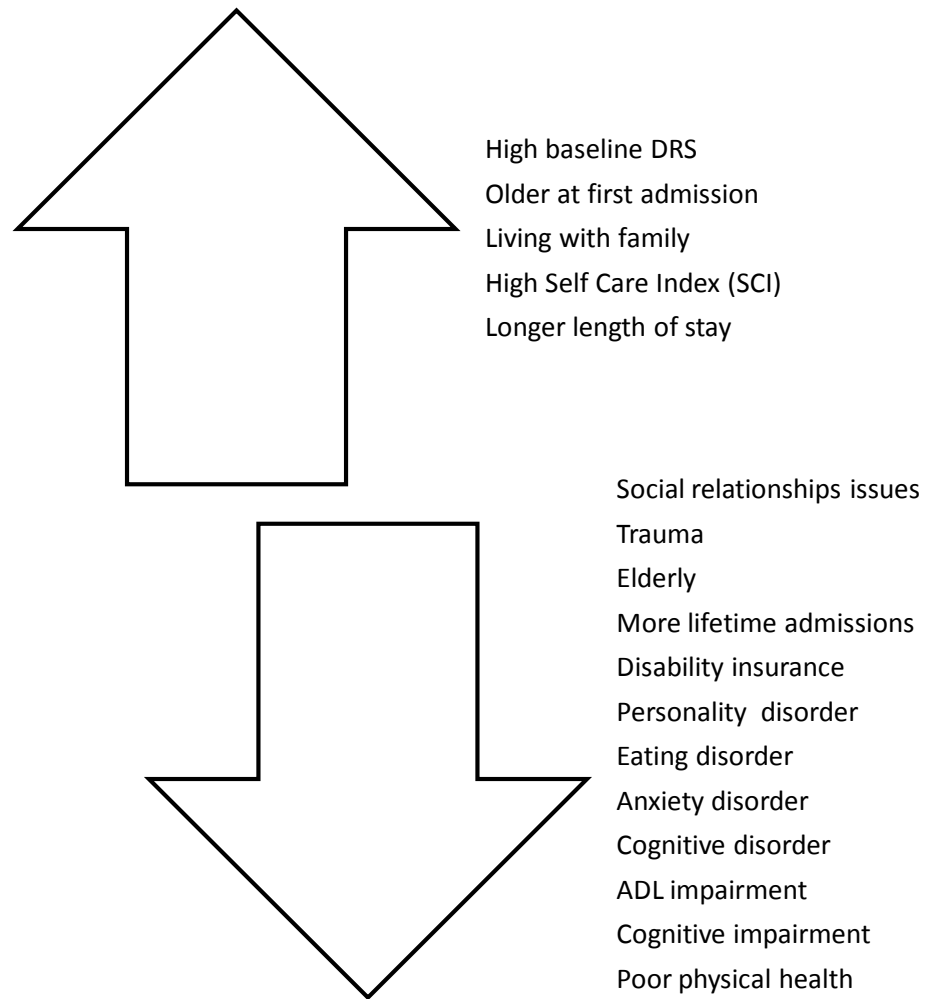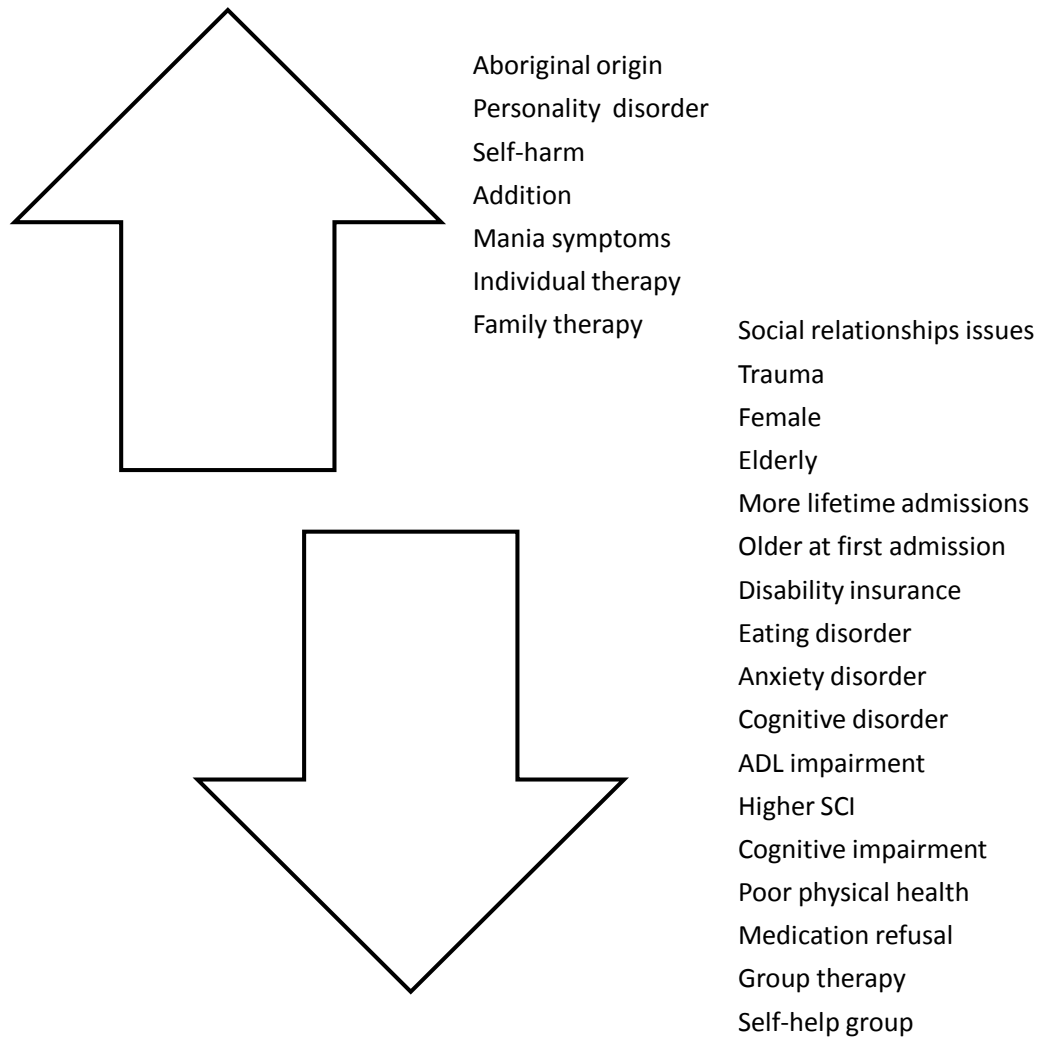**Figure 6**　　　　**Summary: Predictors of Improvements of Depressive Symptoms**

High baseline DRS

Older at first admission

Living with family

High Self Care Index (SCI)

Longer length of stay

Social relationships issues

Trauma

Elderly

More lifetime admissions

Disability insurance

Personality disorder

Eating disorder

Anxiety disorder

Cognitive disorder

ADL impairment

Cognitive impairment

Poor physical health

Figure 7   Summary: Predictors of Rapid Improvements of Depression Symptoms

Aboriginal origin

Personality disorder

Self-harm

Addition

Mania symptoms

Individual therapy

Family therapy

Social relationships issues

Trauma

Female

Elderly

More lifetime admissions

Older at first admission

Disability insurance

Eating disorder

Anxiety disorder

Cognitive disorder

ADL impairment

Higher SCI

Cognitive impairment

Poor physical health

Medication refusal

Group therapy

Self-help group

6.   Discussion

There were two main objectives of this study. First, to add to knowledge about the relationship between depressive symptoms and social relationships. Second, to identify the factors that can predict improvements of depressive symptoms, including social relationships and other potential predictors.

The study revealed that many factors can predict an outcome of depressive symptoms during hospitalization. Difficulties in social relationships predict poorer outcome of depressive symptoms as other studies have reported (Coryell et al., 1993; Hirschfeld et al., 2000; Judd et al., 2000; Kennedy et al., 2007; McKnight & Kashdan, 2009; Tse and Bond, 2004). Being elderly is a predictor of delayed improvements of depressive symptoms as previous studies have shown; however, gender, marital status and employment were not significant predictors of outcome in contrast to other studies (Bosworth et al., 2002; Bracke, 1998; Herrman et al., 2002). Multi-morbidity of psychiatric diagnosis predicts a worse outcome as well as functional impairments, chronicity, and financial difficulties. The association of depression and poor physical health has been established in numerous studies (Cohen, 2004), and the present results confirm that poor physical health predicts negative outcome of depressive symptoms.

This study showed that patients with depressive symptoms have a higher prevalence of traumatic life events than other psychiatric populations, which predicts lower improvement rates. These findings are consistent with the literature (Brugha, 2003; Mathias et al., 2010). Individual therapy and family/couples therapy predict more rapid improvements, but have less effect over a longer period of time. Almost all patients in the study had prescribed medication but combined interventions of both medication and psychotherapy are considered best practice in moderate and severe depression (Manber et al., 2008; SIGN, 2010). Longer stays in psychiatric facility can

predict better outcome in depressive symptoms, which is conflicts with the recent trend to shorten patient's stays in hospitals. However, some of the results related to rapid improvements of depressive symptoms may represent a "facility effect" for patients in acute units compared to those in long term units which have much longer length of stay. Patients in acute units are discharged much sooner; hence, they are re-assessed sooner showing more rapid improvement. Effective community mental health services and improved psychosocial interventions are vital to maintain the chain of care after patient's discharge from an in-patient facility. This is especially important for those patients with delayed recovery or a history of relapse.

Theoretically, there is no widely accepted definition of the phenomenon of mental health but recent definitions have increasingly taken more holistic approach of general well-being instead absence of symptoms alone. The World Health Organization defines mental health as: "Mental health is not just the absence of mental disorder. It is defined as a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community" (WHO, 2007a). One could ask if the measurement of depressive symptoms such as the Depression Rating Scale (DRS) grasp the concept that it is intended to that is that the absence of symptoms moves the patients closer to wellness. The DRS is intended to measure presence and severity of depressive symptoms and is an observer based measurement. The scale does not include symptoms of anhedonia, suicidality or difficulties in social relationships such as social isolation, which are highly prevalent in patients with depression. Therefore, improvement in depressive symptoms according to the DRS could possible overlook important aspect of depression. Even though the follow-up measurements indicates improvement, depressive mood could linger resulting in poor outcome and quality of life.

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Interventions for depressive disorders are numerous, but the most common are pharmaceutical and psychosocial interventions. However, 67% of the patients in this study receive the combination interventions of medication and individual therapy. A very small percentage received family/couples therapy (7%). Given that those two psychosocial therapies predict more rapid improvements of depressive symptoms, it may be appropriate to employ those interventions on a broader basis. Conversely, while group therapy approaches are widely employed in psychiatry, they appear to be less effective in supporting improvements in depressive symptoms. There are cost implications to be considered – group therapy is less resource intensive than individual or couples therapy; however, these should be balanced against the costs of prolonged hospital stays.; ho;

6.1   Depression and the interRAI Social Relationships CAP

Social relationships are complex and multi-dimensional phenomenon. Relationships involve interactions between more than one participant: family members, friends, acquaintances, employees, and social institutions, to name but a few. Therefore, addressing difficulties related to social relationships have to be multifaceted. To focus only at the individual level in this context simplifies the discussion but fails to grasp the whole picture.

As discussed earlier, studies have shown that even after patients with depression are in remission, difficulties in social relationships may continue to linger (Kennedy et al., 2003; Kennedy et al., 2004; Kennedy et al., 2007; Kennedy and Payne, 2004; Skärsäter, 2005). The interRAI Social Relationships CAP is intended to assess and provide guidelines for clinicians to support improvements in social relationships in broad context. The importance of addressing the issue of the social aspect of patient when treating depression is substantial when the

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consequences of difficulties in both depression and social relationships are considered. Not only does depression and lack of or poor quality of social relationships reduce the individual's quality of life, but have they a substantial impact on families, social network, and the broader community.

This study shows that the prevalence of the Social Relationships CAP being triggered is very high (70%), affecting thousands of psychiatric patients. There is a gap between improvement rates of depressive symptoms and improvements of social relationships difficulties; hence there is an increased risk of not achieving full remission resulting in recurrent relapses.

Even though the majority of the patients in this study triggered the Social Relationship CAP, the prevalence and distribution is not consistent for all sub-groups. Older patients and patients with cognitive and self-care impairment have more difficulties both due to more resistant depressive symptoms and in social relationships, especially regarding social isolation. This is consisted with results from other studies (Hirschfeld et al., 2000). On the other hand, younger patients, patients with addiction and patients with personality disorders showed more problems within the family and less social isolation.

Are depression and difficulties in social relationships two different concepts or are social issues a manifestation of a state of depression? Can we address social issues by use conventional interventions for depression or is there a need for special interventions to improve social functioning? There is some evidence that treatment modalities such as family therapy and individual therapy (CBT and interpersonal therapy) can improve depressive symptoms. However, not all patients in this study who could potentially benefit from these interventions receive these therapies. On the other hand, conventional interventions for depression do not seem

to improve social function to the same degree as they improve depressive symptoms. Therefore, a new approach to treatment is necessary.

6.2   Implications for clinical practice

The findings from this study have several implications for clinical practice. The interRAI-MH is a comprehensive inter-disciplinary instrument that has been reported to be both valid and reliable and the DRS have shown itself to be a valuable predictor of clinical outcome (Hirdes et al., 2002; Martin et al., 2007a). The DRS can be argued to be a good choice to assess depressive symptoms at least in geriatric and psychiatric populations.

This is the first study on the new interRAI-MH Social Relationships CAP and the findings are promising for using the CAP in clinical practice to address social issues in patients care more efficiently. The majority of the patients in this study did not show any improvements regarding family relationships and social isolation during in-patient period even though the majority showed improvement in depressive symptoms. The overall goal of the Social Relationships CAP is to evaluate further potential underlying factors that are related to problems in social relationships, to identify and manage symptoms that isolate the patient, to improve social skills, to facilitate safe, supportive and meaningful social interactions and community integration. The Social Relationships CAP provides holistic, multi-dimensional, evidence-based guidelines for careplanning for the individual and his or hers social network. The CAP is designed to address social issues for all psychiatric patients both in-patients and patients receiving care in the community which gives the prospect of patient's follow-up and multiple comparisons between different populations and care settings.

Findings from this study revealed that difficulties in social relationships and depressive symptoms affect thousands of psychiatric in-patients in Ontario and persist at discharge. Acknowledging and addressing this problem on the basis of clinical evidence can have a valuable effect for clinical outcomes and wellness for this population. However, ignoring the social relationship can have serious consequences resulting in chronicity and poor quality of life. The DRS and the Social Relationships CAP can provide valuable tools to evaluate effectiveness of interventions and predict future outcome for this patients.

Almost one quarter (23%) of the patients in this study showed no improvement in depressive symptoms and up to 70% did not show improvement in social relationships during the study period. Clinicians should ask themselves "what are acceptable therapeutic improvements in depressive symptoms and social impairments during psychiatric hospitalization?" This raises another question of how we define psychiatric disorders, do we consider them as chronic or recurrent diseases where achievement of full recovery is out of reach or as diseases that can be "cured". Answers to these questions would give us honest and realistic guidelines to follow.

The most frequently reported criteria of remission in antidepressant treatment clinical trials has been arbitrarily defined as $\geq 50\%$ reduction of symptoms severity (McIntyre, 2006). This definition of recovery can be useful in research, but is of less utility in clinical settings since categorical reduction of symptoms can fail to reveal clinically significant recovery. Development of benchmarking for remission and recovery of depressive symptoms would be valuable for clinical practice.

Pharmacological interventions remain the most common intervention, despite of the evidence showing that psychosocial interventions in addition to pharmacological intervention are the most effective interventions for moderate to severe depression (APA, 2000; CPA 2001:

SIGN, 2010). Utilization of the RAI-MH instrument can support clinicians in their choice of interventions for a particular patient or sub-populations by providing quantifiable clinical measurements of needs and outcomes. For the population of interest in this study, combined treatment with medication and psychotherapy is the most effective treatment and has as well shown to be more effective to increase social functioning in other studies (Dank Sundhedsstyrelsen, 2007). It is an important finding that individual, family and couples therapies predict more rapid improvements in depressive symptoms. Other studies have failed to confirm the efficacy of couples therapy, but it is nevertheless considered as a good practice (SIGN, 2010).

Lastly, this study reports that a longer hospital stay can predict better outcomes in depressive symptoms. However, patients with a mood disorder diagnosis and depressive symptoms had considerably shorter mean length of stay than patients in the full sample. As length of stay in psychiatric hospitals/units continues to be shorter, patients still tend to have depressive symptoms and difficulties in social relationships at the time of discharge. This raises the question if patients with depressive symptoms could benefit from longer stay or if treatment in the community will improve depressive symptoms to the degree of recovery or full remission? We do not have follow-up data to evaluate these patients after discharge. Therefore no information is available about whether they recovered after discharge or if they receive any community mental health services.

6.3   Implications for policymakers and government

Depression is highly prevalent recurrent disease and is predicted to be the second leading cause of disability in 2020 (WHO, 2007a). As previously discussed, depression is a complex multi-

dimensional disease that affects the individual, family, and community on many levels. To successfully address this issue, a multi-faceted holistic approach is necessary. The findings from this study have several implications for policymakers and government.

First, the economic consequences of recurrent depression are gigantic - high resource use, absenteeism from work and school, unemployment, disability, rehospitalisation, and suicide to name a few (Lieberman, 1998). Providing more multi-dimensional and holistic care as this study recommends, such as more available family and couples therapy, the government and policymakers must be aware of that demanding more comprehensive care demands increased resources or different allocations of funding. New and improved interventions call for more staffing, education, and training that require more financial resources, but will hopefully improve outcomes. A stronger focus on depression and social function could lead to less economic burden with less resource use and better function of the individual in the community.

Secondly, as reported previously, the mean length of stay for depressed patients is considerable shorter than other psychiatric patients and longer length of stay predict better outcome. One could argue that the recent years trend to cut down length of stay do not benefit those patients. Any further cut-backs of hospital stays should be avoided, especially for groups of patients that take longer time to recover such as the elderly, women, patients with multi-morbididty, and cognitively and functionally impaired patients.

Third, benchmarking is a strategy to compare outcome data obtained from clinical practice against reliable outcome standard observed in clinical trials. Benchmarking gives the opportunity to compare different service providers, provinces and countries to compare with one another and to "the gold standard". No widely accepted benchmarking for improvements rate in

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depressive symptoms or social impairment have to date been established; however, researchers have attempted to evaluate pre-treatment post-treatment benchmarks for special interventions and populations (Merill et al., 2003; Minami et al., 2007; Weersing et al., 2006). Due to mandated use of RAI-MH in Ontario there are abundant data available and use of the interRAI common language should make c benchmarking straightforward. Policymakers and government can facilitate the use of RAI-MH clinical assessment protocols (CAPs), outcome measures, quality indicators, and case-mix classification system as a tool in decision making, policymaking, and benchmarking.

Lastly, the interRAI Community Mental Health (interRAI CMH) should be implemented in jurisdictions that currently using the interRAI MH in in-patient psychiatry to allow clinicians, policy makers, government and scientists to follow patients after discharge. By using the common language of the interRAI instruments, all comparisons of quality in different settings and resources utilisations are made easy and accurate.

6.4   Implications for research

Future research should focus on further prospective longitudinal studies both in-patient psychiatry and community mental health settings. That will provide continuous follow up across time and agencies and an opportunity to evaluate long-term outcomes in depressive symptoms and social relationships in patients receiving formal care. Use of the interRAI CMH instrument would facilitate effective comparisons. Special attention should be made on improvement patterns of depressive symptoms after discharge and the consequences of not achieving remission.

There is a lack of clinical studies on social functional outcomes in psychiatry. Further research on social relationships problems and their clinical and socioeconomic consequences, in depressive patients, would add to existing knowledge. Additional studies are needed to attempt to predict improvements in the Social Relationships CAP and its value for clinical practice and policy making.

This study was done in Ontario, but repeated studies in other provinces and countries are needed to confirm the generalizablity of the present results. Also, studies on different ethnic groups are needed to establish if cultural differences play a role in the manifestation of depression and difficulties in social relationships.

6.5   Strengths and Limitations

There are several notable limitations to this study. First, observation bias could occur because the clinicians that assessed the patients had not received controlled standardized training so differences in coding could occur. Observational bias probable cannot be completely eliminated, but can be minimized by careful training.

Secondly, some important variables are not available in the RAI-MH. For example, no information is available on what form of individual therapy the patients have received. The most common psychotherapies today include cognitive behavioural therapy, interpersonal therapy, psychodynamic therapy and problem solving therapy; however, clinical practice guidelines' vary on the strength of evidence they are based on. Information on what kind of therapy predicts better outcome of depressive symptoms would be of great clinical value. Other variables that could shed a light on the relationship between depression and potential predictors of outcome are what type of and (effectiveness) formal social resources patients have received in the past and

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what resources will be utilized after discharge. Variables of personal strengths and weaknesses, personal characteristics such as self-confidence and self-efficacy, could be of both academic and clinical interest but perhaps difficult to define and measure.

Third, even though studies have shown the DRS to have good reliability and validity (Hirdes et al., 2002, Martin et al., 2007a) more studies on its psychometric properties for subpopulations, such as younger adults and patients receiving community mental health services, would strengthen its validity. As previously reported, the RAI-MH does not include all ICD-10 criteria symptoms and some items in the assessment could be added to increase the validity, for example anhedonia and suicidality (Martin et al., 2008). It could also be argued that a 50 percent severity improvement rate instead of improvement by 2 or more DRS points could be better method to measure improvements in depressive symptoms to avoid regression to the mean and simplify interpretation.

The main strength of this study is the large sample size with census-level data where all patients were eligible reducing selection bias. This gives the study findings a great power and generalizability. Secondly, all the assessors were trained clinicians and even though they did not receive standardized training the all receive some type of training. Lastly, the RAI-MH is widely available and accepted by many agencies and countries offering the opportunity for integrated multi-domain assessment, enabling electronic clinical records, data transfer, and ease of interpretation (Gray et al., 2009).

7. Conclusions

The consequences of not achieving remission of depressive symptoms are recurrency and chronicity, multi morbidity, increased risk of suicide, increased functional impairment, increased medical and social service utilizations and decreased quality of life. Findings from this study revealed that many factors predict clinical outcome in depressive symptoms. One of those predictors is difficulties in social relationships, which when present decreases the odds of an improvement. The interRAI Social Relationships Clinical Assessment Protocol provides a tool to address social issues in patient care and its revision will hopefully help to identify patients with social relationships problems, assist clinical staff in care planning and provide mental health authorities information for policy making.

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Appendices

Appendix A   Ethical Clearance

UNIVERSITY OF WATERLOO
OFFICE OF RESEARCH ETHICS

Feedback on Ethics Review of Application to Conduct Research with Humans

All research involving human participants at the University of Waterloo must be carried out in compliance with the Office of Research Ethics Guidelines for Research with Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

ORE File #: 14148

Project Title: Social Function and Depression in Psychiatric In-patients: Prediction of Outcome

Faculty Supervisor: John Hirdes   **Department/School:** Health Studies & Gerontology
Student Investigator: Rannveig Thorsdottir   **Department/School:** Health Studies & Gerontology

The above research application has undergone ethics review through the Office of Research Ethics and received the following ethics review category:

☐ **Full Ethics Clearance.** The application is considered acceptable on ethical grounds and complies with ORE Guidelines for Research with Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. No revisions are required.

☑ **Full Ethics Clearance*.** The application is considered acceptable on ethical grounds and complies with ORE Guidelines for Research with Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans. * **Minor/editorial revisions are required** as outlined in a transmitted email. Revised materials must be provided for the ORE file.
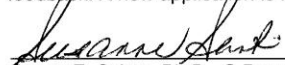
CONDITIONS ASSOCIATED WITH FULL ETHICS CLEARANCE:
1. Ethics clearance is valid for four years from the date FULL ethics clearance is granted.
2. Projects must be conducted in accordance with the description in the application for which full ethics clearance is granted. All subsequent modifications to the protocol must receive prior ethics clearance through the Office of Research Ethics.
3. An annual progress report (ORE Form 105) must be submitted for ethics review for each year of an ongoing project.
4. Any events, procedures, or unanticipated problems that adversely affect participants must be reported to the ORE using ORE Form 106.

☐ **Provisional Ethics Clearance.** The following revisions and/or additional information must be provided for ethics review and are requested within **10 days**. A study may not begin until it receives FULL ethics clearance.

    ☐ Information Letter was not provided and is required for ethics review.
    ☐ Information Letter provided is incomplete and requires revisions outlined in transmitted email.
    ☐ Information Letter and Consent Form were not provided and are required for ethics review.
    ☐ Information Letter and Consent Form provided are incomplete and require revisions outlined in transmitted email.
    ☐ Copy of interview/survey questions was not provided and is required for ethics review.
    ☐ Other revisions/information are required as outlined in transmitted email.

☐ **No ethics clearance status assigned.** Due to the level and/or number of questions and concerns raised during the ethics review process no ethics clearance status was assigned at this time. Comments are summarized in the attached ethics review feedback. A new application is required.

_____
Susan E. Sykes, Ph.D., C.Psych.
Director, Office of Research Ethics
OR
Susanne Santi, M. Math
Manager, Research Ethics

8/27/07
_____
Date

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Social Relationships
Clinical Assessment Protocol

August 2010

I.   Problem

It is important to consider engagement in social relationships both as a dimension of recovery from mental illness and as a predictor of a variety of quality of life outcomes for persons with mental illness. The social relationships CAP examines how a person relates to others; how other people react to the person; and how the person initiates interaction, engages with others, and participates in the broader community. Difficulties with social relationships can be the result of problems at the individual, informal network, and broader community levels. For example, problems with social relationships may be exacerbated by specific psychiatric symptoms (for example, aggression, cognitive impairment). They may have their origins in a history of abusive relationships, or in a social environment that is not supportive and accepting of the person. Social relationships should be addressed from a variety of perspectives including types of social contacts (for example, family members, friends, neighbours, coworkers); frequency and nature of interaction; location of social activities (for example, in home only vs. public settings); and participation in community activities.

Problems with social relationships can result in isolation, loneliness, and unhappiness. However, the person may also experience threats to basic needs such as food and shelter if relationships with family and friends are compromised to the extent that the person is fully isolated from, or in conflict with, these ties. Therefore, it is critical to consider what factors contribute to problems in social relationships and what other factors are exacerbated by this difficulty.

This CAP aims to address factors leading to disruption in social relationships that may ultimately result in isolation of the person from friends, family, and the broader community. Efforts to alleviate problems related to social relationships should not be targeted at the person only. Therefore, this CAP points to problems experienced by the person AND the informal network and community. In other words, interventions to support improvements in social relationships should consider the broader social context, and not treat the person in isolation.

Short term goals

- Identify and manage symptoms (for example, aggression, depression, negative symptoms) that isolate the person from others
- Identify and respond to causes of problems related to family functioning
- Improve social skills to support effective interaction with others and relationship building
- Provide opportunities for the person to experience safe and supportive social interactions

Longer term goals

- Support establishment of confidante relationships and meaningful social connections
- Reduce impact of negative personal experiences on social relationships
- Foster community integration

II. Triggers

❑ **Triggered to reduce social isolation and family dysfunction** – This subgroup includes persons who have problems with family function (as described below), have no confidante present, AND one or more of the following indicators of social isolation are present:

- no participation in activities of long standing interest in the last 30 days;
- withdrawal from activities of interest;
- reduced social interaction;
- no in-person, telephone, or email contact with family or friends in the last 30 days .

This group includes about 30% of persons in inpatient psychiatric settings and 15% of persons receiving community-based mental health services. Over a 90-day period or by the time of discharge (if less than 90 days), the majority of these persons will show improvements in the level of social relationships, but the rate of improvement is not consistent for all subgroups. For example, those with higher levels of cognitive impairment, higher scores on the CAGE addiction screen, higher levels of aggressive behaviour, and a higher number of prior hospitalizations are less likely to improve. In addition, persons admitted from correctional settings and those in forensic programs are less likely to improve in this CAP.

Triggered to improve close friendships and family functioning – This subgroup includes persons with problems related to close friendships and family functioning. The specific indicators used to trigger this CAP level include one or more of:

- family or close friends overwhelmed by person's illness;

- person or others consider family roles to be dysfunctional; or
- severed or conflict-laden relationship within the last year

This group includes about 30% of persons in both mental health in-patient settings and community-based mental health. In hospital settings, about 23% of this group improves by discharge, and about 8% also develop problems related to social isolation. In community mental health, about 35% improve and 10% decline in this CAP. As with the social isolation and family dysfunction trigger level, persons in this group are less likely to improve and more likely to decline when conditions like cognitive impairment, aggression, and addictive behavior are present.

Not Triggered – Anyone who is not currently experiencing indications of problems with family or close friendship interactions.

The Not Triggered group includes about 40% of persons in a mental health in-patient setting and 53% of persons receiving community-based mental health services. The development of subsequent problems with social relationships is relatively uncommon for this group in hospital settings (about 9%). However, the rate of new problems related to social relationships is almost twice as high (19%) for this group in community mental health settings. Appropriate support for the Not Triggered group is focused on monitoring for any unexpected mental health symptoms or behaviors that may affect the person's ability to relate effectively with others.

III. GUIDELINES

In community mental health settings, persons who have had fewer lifetime psychiatric admissions are more likely to improve in the social relationships CAP and less likely to decline than those with multiple lifetime admissions. In inpatient settings, cognitive impairment (use the Cognitive Performance Scale embedded in the interRAI mental health instruments) is associated with a reduced likelihood of improvement. In addition, person's admitted from correctional facilities and forensic admissions are more likely to trigger the Social Relationships CAP at a higher level over time. These findings suggest that approaches to improving function should take into account the person's mental health history and their current level of functioning. Interventions should be matched to the person's strengths and abilities and they should consider the impact of the person's mental health experiences on their social relationships. For example, persons with earlier first psychiatric admissions are less likely to be married, have children, or have been employed (an important source of potential friendship ties) than those whose first admission occurred in later life.

For persons experiencing a problem related to social relationships, consider both the potential underlying causes of the problem **and** its consequences for the person. The following issues should be explored when considering both levels of this CAP. This will provide a starting point for either reducing social isolation and family dysfunction or improving social involvement and family functioning,

- Is the social relationship problem new or is it something the person has experienced over a prolonged period of time? Has there been a recent change, either for better or worse? If so, what were the circumstances that preceded that change?
- Do mental health symptoms (for example, anxiety, depression, aggression, cognitive impairment) affect the person's ability to establish or maintain relationships? Is the person's isolation from others a deliberate, reasoned choice or is it a consequence of mental health symptoms that could be alleviated with treatment?
- How effective are the person's social skills (for example, communication, initiation of interaction, responding to verbal and nonverbal cues) when dealing with others?
- Do family, close friends and other community contacts provide an environment that supports the person in interacting with others?
- Do physical health issues (for example, pain), functional problems (for example, mobility), or IADL problems (for example, capacity to use transportation) affect the person's ability to interact with informal network members or participate in community and family events?
- Is the person aware of community resources that are available (for example, drop-in centres, recreational programs, volunteer opportunities)?
- Does the person have a history of substance abuse? If so, what is the response of family and close friends to the behaviour? What are the consequences of the person's substance use for family functioning? Refer to the Substance Use CAP.
- Has the person experienced stressful life events? Are they indications of trauma associated with these events? Has the person experienced abusive relationships within his or her family? Refer to the Traumatic Life Events CAP.
- What is the person's view of his or her role performance in the family? Does the person feel he or she is contributing to any difficulties related to family functioning?
- Does the person want to change or improve interpersonal relationships? Does the person feel hopeful that positive changes in social relationships are feasible? Does the person feel isolated irrespective of objective indicators of his/her level of isolation? Is the person happy being isolated from others or does the person wish to re-engage severed relationships?
- What is the person's perception of his or her responsibility for improving role functioning? What is his or her perception of the support and encouragement provided by others?
- Are there cultural considerations that affect the person's engagement with others that should be taken into account as part of the care plan?
- Does the person have access to a phone or email? Does the person live in a rural setting with limited opportunities for community activities? Is lack of transportation a barrier to the person's participation in the community?
- If the family feels overwhelmed by the person's illness, what types of support do they feel they need?

Intervention Strategies for Both Trigger Levels

For the social relationships CAP, it is critical that the person and his/her informal network members be central in the care planning discussion. The response to concerns related to social

relationships must include the person as an active decision-maker and it must achieve a collective commitment to positive change. The person should accept responsibility for responding to issues that have affected social relationships wherever possible; however, this is a **shared** responsibility with the family, close friends, and members of the mental health team. Social relationships are, by definition, not an individual concern.

The person's capacity to participate in a discussion related to social relationships will be affected by the severity and acuity of current mental health symptoms. Those who are acutely ill or experiencing severe impairment in cognitive function will not be in a position to discuss complex issues related to role function, family dynamics, interpersonal relationships or community engagement. In such circumstances, the focus may be more on symptom management and support of the family or close friends to ensure their continued engagement in the person's recovery.

On the other hand, as soon as the acute phase of illness has subsided (for example, a reduction or elimination of disturbances of thought content or form, evidence of improvement in mood and concentration), the person should be actively involved in efforts to address issues related to social relationships. The following actions should be considered and tailored to the specific circumstances of each person and his or her social network.

Readiness to change and self-efficacy

Readiness for change is a dynamic process and the clinical approach should focus on providing support that is congruent with the person's current point in the change process and moving him or her to the next level. . For example, if the person recognizes that there is a problem but is uncertain if he or she wants change, help the person identify the reasons for change and the impact of change on his or her well-being. However, if the person is at the point where he or she is prepared to make change but is not aware of what he or she can do to bring it about, the clinical focus would be to support the person as he or she takes specific actions aimed at improving social relationships. Self-efficacy is an important factor to consider during any change process and recovery. It is also important to work with the person so that he or she comes to understand that personal identity and ability to change is not defined by his or her mental illness. Rather, meaningful engagement (or re-engagement) in the community becomes an achievable primary goal.

Understanding what might be possible

The key is to first determine the dissonance in how the person and the family appraise their mutual involvement with one another, and what it might take to either improve the situation, or reduce the risk of it becoming more problematic. This assumes that there are others in the extended network with whom to work. It should be noted that there will be some person's who are less likely to have a history of strong interpersonal relationships. For example, persons with earlier first psychiatric admissions are less likely to be married, have children, or have been employed (an important source of potential friendship ties) than those whose first admission occurred in later life. Thus, one needs to identify the following: with whom could the person interact; how does the person's mental health, cognitive, and functional deficits challenge

communication; and how do the identified family and friends feel about re-engaging with the person. The following are examples of the types of approaches that build out of this:

- **Mutual interest by the person and his or her family and friends in reengaging with each other:** This is the most positive of circumstances but do not assume that additional supports are not required for this to succeed. For example, couples or family therapy can be helpful to identify problem areas and build on strengths in the relationship.
- **The person has unresolved conflicts with others that affect his/her current level of social participation.** Resolution of all conflicts may not be a realistic or necessary goal for supporting the person's engagement of others. However, in some cases old sources of conflict may be amenable to resolutions that would be to the benefit of all parties concerned. These conflicts can come from many sources, and each needs to be considered, including: physical or mental abuse; conflict over finances; conflict over children; conflict over poor lifestyle choices. To approach these issues, see Interpersonal Conflict CAP.

History of substance abuse

Substance abuse can have a profound, adverse impact on family functioning, friendship and community involvement. Persons with a history of substance abuse are more likely to experience conflict with others which may in turn harm the viability of important social relationships (see Substance Use CAP). In inpatient settings, higher CAGE scores are associated with the development of new problems in social relationships among those who did not trigger the CAP at admission. Referral to an appropriate substance abuse program should be considered where there are current indications of use of illicit drugs, misuse of prescription medications, or subjective indications of substance use problems based on the CAGE items included in the interRAI MH and CMH. On the other hand, it may also be the case that some members of the person's informal network support or engage in substance abuse with him or her. In such cases, it will be important to discuss the impact of the relationship with those individuals on the person's broader social functioning and quality of life. Help the person to recognize signs of and to avoid social situations that are not conducive to healthy behaviours. The basic goal is to support the person in establishing new, positive social relationships.

Physical health affecting the person's participation level

Problems with physical health may limit the person's ability to participate in family or community events. For example, if the person feels sick on a continuous basis, is fatigued, or experiences substantial pain, he or she may not pursue social interactions outside of the immediate living situation because of the symptoms experience. In addition, problems with mobility may make it difficult to leave the home if appropriate support is not provided. If there are unresolved physical health problems, a physician referral is in order. If the person is experiencing on-going problems with fatigue, he or she may benefit from energy-conserving strategies that will support continued involvement in activities of interest (for example, breaking activities into small, manageable steps; stopping to rest as needed; learning relaxation techniques). Difficulty with mobility can be addressed through involvement with

an Occupational Therapist or Physiotherapist with the goal of improving strengthen and tolerance for activity or providing appropriate mobility aides.

Communication and problem-solving skills of the person and family are compromised

Effective communication can reduce stress and conflict, clarify expectations and responsibilities, and support development of mutual goals. Both the person and the family should be provided support that will help improve communication and problem-solving skills, where appropriate. For example, consider a formal social skills training program to improve conversation techniques, conflict resolution, and confidence in interpersonal interactions and interpreting social cues. A life-skills program may be helpful to increase the person's level of comfort in community settings (for example, shopping, ordering meals, asking for assistance). Family counselling should also be considered as a strategy to improve communication between the person and his or her family.

The person has experienced an abusive relationships

There is a clear relationship between triggering the Social Relationships CAP and a history of sexual, physical, or emotional abuse, particularly where the person describes those events as having caused intense fear or a sense of horror (see the Abusive Relationship CAP). Such traumatic events can have a profound impact on the person's level of anxiety, self-confidence, and willingness to engage with and trust others. In addition, it may have a structural impact on the family and may, at least in some cases, preclude interaction with specific family members, friends, or other acquaintances that perpetrated the abuse. It may not always be in the person's best interest to pursue re-engagement with inactive family or friendship ties. For example, prior abusers may continue to pose a threat to the person's physical or psychological well-being. If these conditions are present, the recommendations in the Traumatic Life Events CAP take priority.

Problematic former relationships

Contact with former criminal associates may increase the risk of recidivism. Similarly, for persons who have recovered, or are in the process of recovering, from addictions, the risk of relapse may increase if the person returns to a milieu conducive to substance abuse. Most persons with this type of history will have trouble setting social boundaries and avoiding problematic social situations. In general, the approach should be to: provide the person with the information about the risks of re-establishing these ties; identify alternative options for developing new supportive relationships; address any barriers that prevent persons from engaging in new relationships; and establish new strategies for engaging in positive relationships.

Role of external factors in the social and physical environment

The person's ability to participate in community activities or to visit with family or friends may be affected by environmental factors such as weather, geographic isolation (for example, in remote rural settings), lack of adequate transportation, or concerns about safety in

public settings. In addition, stigma, intolerance, and lack of acceptance by the community can severely constrain the recovery of persons with mental illness.

Determine whether the person is aware of, and understands how to make use of, transportation options in the community. In some cases, it may be necessary to arrange in-home services (for example, friendly visiting). If poverty is a barrier, make the person aware of community resources to which they are entitled, including income subsidization, housing, and subsidized leisure activities that may be available through community recreation centres. It may be necessary for the clinical team to help the person navigate the system to access such services.

Awareness of community supports
Many communities have programs like club houses, consumer-run drop-in centres, supported socialization groups, and work programs that may help the person make new social connections.. The person should be informed of any such available programs and given assistance to access those of interest. Provide the person with information about organized activities that may be of interest. Also, consider the person's need for support in establishing initial contact with community programs.

Family education
Family members may benefit from information about the person's mental illness, coping strategies, balancing personal and family needs, or treatment options. It should not be assumed that family members have the information they need to be an effective source of support to the person or that they fully understand what their relative is experiencing. An effective family intervention will include an educational strategy that addresses the information needs of the person and his or her family. Also, family members should be advised of support groups targeted toward their needs.

Therapy programs
There are a variety of options for individual, family or couple, or group therapy based interventions to reduce isolation and promote positive re-engagement with family or friends. For example, about 45% of persons in the first and second trigger levels of this CAP are involved in group therapy treatments in inpatient psychiatric settings compared with about 35% of the not triggered group. Self-help and peer support programs can be an important resource for supporting the person's recovery. Prior to discharge from an inpatient setting, the person should be linked with local community agencies that can provide appropriate supports after leaving hospital.

Other considerations
It is important to consider social relationships not only as an outcome, but also as a predictor of quality of life and recovery in other domains. For example, among persons receiving community mental health services, the rates of making economic trade-offs between purchasing necessities such as food, shelter and clothing is four-times and five-times higher among persons triggering the first and second levels of the Social Relationships CAP. Similarly, persons triggering the CAP at the highest level are almost 2.5 times more likely to experience residential instability compared with those not triggering the CAP. The rates of eating one or fewer meals rise from

below 1% of those not triggering the CAP to 6% and 13% of those triggering the first and second levels, respectively.

In inpatient mental health settings, the Social Relationships CAP is related to length of stay and to the rate of improvement in symptoms related to conditions like depression. Social relationships can be valuable sources of support that can aid in recovery from mental illness, and they may provide practical help (for example, accommodation) that may have an impact on the timing of discharge.

IV. Additional Resources

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